Journal of Scholarly Endeavor

2023
Symposium for Student Research,
Scholarship and Creative Achievement

Slippery Rock University of Pennsylvania

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MESSAGE FROM THE INTERIM PROVOST AND VICE PRESIDENT FOR ACADEMIC AFFAIRS

The SRU Symposium for Student Research, Scholarship, and Creative Achievement is, among other things, an opportunity to showcase the outstanding work being done by our students. Across campus, students are engaged in significant scholarly and creative activities with the mentorship and support of our expert and dedicated faculty. The Symposium, and its companion *Journal of Scholarly Endeavor*, testify to the commitment SRU has to providing these opportunities for students.

One of the important differences that sets university education apart from primary and secondary education is that the university mission includes the creation of knowledge, not simply its transmission. This is why faculty responsibilities include scholarly growth alongside teaching as requirements for tenure and promotion. At SRU, we go farther, and include students in this fundamental aspect of the university mission. We do this because we are committed to the idea that we learn best by doing. Working side-by-side with their faculty mentors, students can learn what it means to face open-ended questions and construct new answers and meaning beyond what has existed before.

Through the Symposium, we have the opportunity to not only recognize students who have engaged in this type of work, but also to continue their growth as creators-of-knowledge. Because engagement with their questions did not end when they put away their last piece of equipment. After "completing" their study, the real challenge began, as they had to grapple with the best way to synthesize and communicate their results. So, in a sense, they now become the teachers – sharing their newly discovered ideas with those of us who attend their presentations and ask them questions, or who read their abstracts in the *Journal of Scholarly Endeavor*.

In conclusion, I want to extend my deepest appreciation to the faculty who have mentored these students. Without your time and dedication, students would not have had these opportunities. I also want to thank the people associated with the Office of Grants, Research, and Sponsored Programs, particularly Casey Hyatt and Rachel Seminatore, who do the yeoman's work each year of organizing and running this event. And finally, thank you to the students who went above and beyond the minimum requirements of their degree programs, who made the commitment and followed through to a successful completion, and thus demonstrated the opportunities and potential of an SRU education.

Dr. Michael Zieg
Interim Provost and Vice President for Academic Affairs

Art

NATURAL PAPER LANTERNS

Amber Angert

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Exhibit

ABSTRACT:

The idea and intention behind the research of the natural, handmade Pennsylvania fiber paper was to address the problem of the overconsumption of plastic goods, throw-away culture, and the commercialized overshadowing of the natural environment.

In the papermaking process, I tested the durability of Pennsylvania-grown plants, choosing to avoid store-bought chemicals (sizing), despite their ability to make stronger paper. Only soda ash was used to remove acidity from the fiber leaving cellulose pulp with a neutral pH. For future projects, I plan to use homemade lye.

I learned that certain fibers, such as dried corn husk and daylily, were too fragile to make a sheet of paper by themselves. To combat this problem, I mixed in a slurry of locally sourced waste newspaper to add stability.

The resulting paper sheets, which are thick and textured, hide the designs when observed with overhead lighting. The designs (which are based on local tree leaves) are intentionally hidden because the lantern was designed to incorporate lit candles as an internal illumination source. Using plastic candles would have been more convenient; however, I chose to use real fire so the design remains environmentally conscious and plastic-free. Following this theme, foraged blades of grass were used as thread to sew together the paper and create the lantern shape.

The result of the project was a set of handmade paper lanterns that utilize local plant materials and upcycled waste materials to make something that is both environmentally conscious and celebrates the natural environment where I live.

Biology

ASSESSING DRIVERS OF MOSS COMMUNITY DYNAMICS IN WESTERN PENNSYLVANIA FORESTS

Paige Anundson

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Poster

ABSTRACT:

Continued anthropogenic activities alter ecosystem composition, connectivity, and function. In western Pennsylvania, regenerating forest ecosystems' health and diversity can decline due to this activity. Plant communities within the forest can reflect past and current stressors, particularly the mosses. As a highly specific relatively quick establishing community component, log-fall mosses can be used as a convenient indicator to better understand the impacts of human activities on western Pennsylvania's forests. This is due to log-fall mosses requiring specific habitat requirements, difficulty dispersing horizontally to different forest patches, intense negative reactions to stresses in the environment, and lacking non-native species. These communities can be assessed, correlated to surrounding vascular plants, and genotyped. The results from this study indicate that forest communities vary based on a variety of abiotic/biotic characteristics and that moss communities are in turn structured by the surrounding vascular vegetation. It is hoped that this data will allow for rapid assessment of the health and diversity of western Pennsylvania forests and stressors impacting these systems.

VALIDATION OF CRAYFISH HEMOLYMPH GLUCOSE MEASUREMENT USING A POINT-OF-CARE GLUCOMETER

Natasha Davis

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Poster

ABSTRACT:

Animals must respond to diverse environmental stressors in maintenance of homeostasis. Concentration of glucose in animal body fluids is a well-established metric of metabolic stress response. Traditionally, glucose concentrations have been determined using enzymatic assays that require completion in a laboratory setting due to sample handling and equipment constraints. These established assays are relatively technical, expensive, and lack portability, restricting their use in field settings for studies of wildlife. Point-of-care (POC) glucometers have become an important tool for human glucose monitoring, and their use has been adopted by researchers investigating metabolic responses in other animals. However, the use of POC devices for measurement of glucose in invertebrate hemolymph has not been as extensive and an understanding of the correlation of POC results compared to traditional assays is warranted. In this ongoing study, we will compare results of hemolymph glucose measurements in the Eastern Crayfish (*Cambarus bartonii*) using both a POC glucometer and the traditional laboratory-based method. The sublethal effects of stressors on aquatic invertebrate physiology are relatively less studied and crustaceans, such as crayfish, could represent an indicator of response to environmental conditions. The refinement of an alternative technique, such as POC glucometers, for measurement of hemolymph glucose in settings outside the laboratory could be valuable for investigations of basic physiology as well as conservation efforts.

MORPHOGENESIS OF NASAL TURBINAL BONES IN TWO SPECIES OF CERVIDS

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Poster

ABSTRACT:

Mammalian nasal fossae are complex structures, often consisting of multiple scrolled or branched evaginations from the lateral nasal wall, the nasal turbinals. Prior research on bats and primates revealed turbinals employ multiple skeletogenic growth mechanisms and differences in growth rates. Here, we examined turbinal development in larger mammals to determine if a broader pattern exists. Prenatal and perinatal specimens of two deer species (*Muntiacus reevesi* and *Dama dama*) were studied via histology and diffusible iodine-based contrast-enhanced computed tomography (diceCT). In addition, one adult Muntiacus was scanned using diceCT. Ethmoturbinals attain complexity during early prenatal development via iterative "seeding" of mesenchymal condensations that add, first, more ethmoturbinals, and later, interturbinals and epiturbinals that branch away from preexisting chondrified structures. Perichondrial ossification may be involved in increasing the complexity of the maxilloturbinal. Results affirm prior findings on other mammals with complex nasal cavities (e.g. primates and bats) that skeletal tissues employ multiple mechanisms of growth and development in nasal complexity. We observed earlier establishment of elaborate "adult-like" ethmoturbinals compared to the maxilloturbinal. However, in the adult, maxilloturbinal scrolling becomes more redundant with the free margins of dorsal and ventral scrolls, concentrically spiraling inward. In addition, adult Muntiacus ethmoturbinal exhibit a rostral edge expansion, much of which is covered by vascular respiratory mucosa based on diceCT imaging. These results imply that olfactory surfaces are better formed at birth, whereas respiratory regions become more elaborate postnatally, as respiratory demands increase. This supports prior findings in primates suggesting olfactory parts of turbinals grow with negative allometry, whereas respiratory regions of turbinal grow isometrically relative to the rest of the cranium. Histological aspects differing between species, such as Muntiacus having earlier ossification of the maxilloturbinal, require further study.

EFFECTS OF ONE-TIME MEDITATION ON IMMEDIATE EMOTIONAL RESPONSIVITY

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Poster

ABSTRACT:

Meditation is known to have many health benefits including reducing stress, increasing emotional awareness, and improving overall life satisfaction. While it is understood that guided meditation can result in both measurable changes in brain wave activity and improvement in self-reported emotional regulation, the immediacy and duration of such effects are not fully elucidated. Thus, the present study aims to answer the question: Does a single short-term guided meditation session affect immediate responsivity to emotionally salient stimuli?

Portable, cost-effective, and easy to use electroencephalography (EEG) headbands, such as the Muse 2, have been designed to allow anyone to record brainwaves activity while meditating. The associated Muse application for Android and Apple devices also contains pre-recorded guided meditation sessions that can be conducted with or without wearing the headband. In the present study, the Muse application is used to provide a 13-minute guided meditation session to experimental participants. Control participants do not meditate. The Muse 2 headband is then used to subsequently measure brainwave activity while participants are exposed to 10 short video clips, each designed to elicit a specific emotional response. Video clips are presented in a pre-determined, randomized, and counterbalanced fashion. At the conclusion of each clip, a Likert scale is used to measure self-reported emotions of awe, disgust, surprise, anger, joy, liking, fear, amusement, and sadness. Participants consist of a convenience sample, with each participant randomly assigned to either the meditation (experimental) or non-meditation (control) group.

Data analysis is aimed at evaluating the effects of meditation on both brainwave activity and self-report measures. Additionally, correlations between these two variables are investigated. Findings are intended to confirm the effects of a single, short-term meditation session on the immediate intensity of experienced emotion.

THE IMPACT OF NON-NATIVE EARTHWORM ON REGENERATING FOREST COMMUNITIES IN WESTERN PENNSYLVANIA

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Poster

ABSTRACT:

During the last glacial period, earthworms native to the Eastern United States were extirpated causing forests communities in eastern North America to develop without the presence of earthworms for at least the last 20,000 years. Now, non-native earthworms from Asia and Europe, deliberately introduced through human actions, have invaded these forests This invasion potentially may affect these ecosystems' composition and function, although to date no research has assessed the impact of non-native earthworms on these forest systems. The environmental impact of non-native earthworms varies by species, but generally they change soil composition, alter carbon: nitrogen ratios, and decrease phosphorus abundance. By altering the soil composition and chemistry, these non-native earthworms have a cascading effect on forest plant communities. This study specifically seeks to enumerate the impact of non-native earthworms on new-growth forest communities across the Wisconsin glacial boundary in Pennsylvania. We hypothesize that worm diversity and density will alter plant community composition and predict that increasing density of non-native earthworms will result in forests dominated by non-native plants. Forest sites will be identified across various age stands and will be surveyed for worm abundance and diversity using a standard formalin-extraction method. Quadrat sampling will be used to characterize the corresponding plant community. The sampled sites will be re-sampled in spring to see if increased worm activity is present. Further experimental tests are planned to be conducted to find finite effects of worm biomass on a known area of soil, litter, and plant germination. The collected worm biomasses and plant community assessments will be used to identify if any correlations between invasive worm activity and plant community compositions exist. The ultimate goal of this study is to determine if, and to what extent, invasive earthworm species affect regenerating forest density and diversity in Western Pennsylvania.

TAXONOMIC CLASSIFICATION TSED TE1, A BACTERIUM ISOLATED FROM ACID MINE DRAINAGE

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Poster

ABSTRACT:

The study of bacteria has been an ongoing process for hundreds of years. While the field itself covers broad areas, one of the cornerstones is accurate and definitive classification of individual isolates. Through a polyphasic approach, including classical physiology and biochemical testing along with 16S rRNA gene analysis and genome sequencing, a vast number of bacteria have been officially identified, however, in spite of our best efforts, less than 1% of all bacteria have actually been properly taxonomically classified. Over the past several decades, the field of microbiology has made significant advances in the area of molecular analysis which have resulted in much more accurate classification methods. A polyphasic taxonomic study was carried out on strain TSed Te1^T, isolated from sediment of a stream contaminated with acid mine drainage. Nearly complete 16S rRNA gene sequence homology related the strain to *Gordonia*, with 99.52 % and 99.36 % similarity to *G. namibiensis* and *G. rubripertincta*, respectively. Computation of average nucleotide identity (ANI) and digital DNA–DNA hybridization (dDDH) with the closest phylogenetic neighbor of TSed Te1^T revealed genetic differences at the species level, further substantiated by differences in several physiological characteristics. The dominant fatty acids were $C_{16:0}$, $C_{18:1\ w9c,}$, and 10 methyl $C_{18:0}$, very characteristics of the genus *Gordonia*, as was the DNA G + C content of 67.6 mol %. This isolate was also resistant to very high levels of tellurite, selenite, and vanadate, a unique ability possessed by limited bacterial species. On the basis of results obtained, this bacterium was assigned to the genus *Gordonia* as a new species with the name *Gordonia metalliredigo*.

EVALUATION OF IMIDACLOPRID EXPOSURE ON CELL VIABILITY AND GROWTH OF HUMAN CELL LINES

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Poster

ABSTRACT:

This project examines if the commonly used pesticide, Imidacloprid, alters the viability and growth of human cells. Imidacloprid is a systemic pesticide and designed to enter the plant and move into growing tissues in order to prevent insect herbivory. Imidacloprid is a neonicotinoid and kills insect pests by mimicking the chemical nicotine and disrupting the function of the nervous system eventually leading to the insect's paralysis and eventually death. Imidacloprid has been detected in aquatic environments at levels above which the United States Environmental Protection Agency considers safe for aquatic life. Particularly concerning to human health, imidacloprid has also been detected in conventional fruit, vegetables, and honey intended for human consumption. In cell culture assays with a human intestinal cell line, imidacloprid was shown to be strongly absorbed. This indicates humans may be exposed through our diet and the compound absorbed into our body. Studies have indicated that this pesticide results in increased oxidative stress and increase heat shock protein levels in both invertebrate and vertebrate model systems. However, it has not been determined if exposure to varying levels of the compound results in altered cell viability and growth. Human kidney, liver, neuron and breast cancer cells will be treated with 10uM-10mM Imidacloprid and examined for changes in cell growth and viability using an MTS assay.

DETERMINING THE BINDING INTERACTION BETWEEN CAT1 AND ANY1 BY MUTATIONAL ANALYSIS

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Poster

ABSTRACT:

The objective of this study was to determine how active transporters (pumps), located at the plasma membrane of a cell, are regulated. We use two species of yeast (*Schizosaccharomyces pombe* and *Saccharomyces cerevisiae*) as model Eukaryotes to study how such pumps are endocytosed. In eukaryotes, endocytosis is initiated once membrane proteins are ubiquitinated. This ubiquitination tag allows the cell to properly select membrane transporters and place them into endocytic vesicles. Ubiquitination is determined by a ubiquitin ligase/adaptor complex; featuring a core ubiquitin ligase enzyme bound to a variety of arrestin family adaptors which determine which pumps are targeted. Previous studies in *S. cerevisiae* have suggested that a positively charged "basic groove" on the arrestin Art1 interacts with a negatively charged "acidic patch" binding site on the methionine pump Mup1. Charge inversion experiments provide key evidence for this model: adding positive charges to the Mup1 acidic patch completely blocks endocytosis, and compensating negative charges added to the Art1 basic groove restore it. The exact position of the charge inversion pairs is highly specific, suggesting "lock and key" binding. We set out to test whether this mechanism of binding also occurs in *S. pombe* for the pump/adaptor pair Cat1/Any1 (which are structurally similar and closely related to Mup1/Art1). Here we test the acidic patch/basic groove binding model by systematically mutating the cytoplasmic surface of the Cat1 pump. Course grain mutation mapping identified a 5 amino acid, negatively charged acidic patch that is indeed critical for endocytosis. We are currently testing the effect of introducing positive charges in this region, and introducing corresponding negative charges into the hypothesized Any1 basic groove.

A COMMON GARDEN EXPERIMENT ASSESSING THE PHYSIOLOGICAL IMPACTS OF ROADSIDE RUNOFF ON COMMON JEWELWEED *(Impatiens capensis)*

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ABSTRACT:

In Pennsylvania, changing climatic conditions and application of salt and cinders during winter weather conditions have the potential to change growing conditions for flora present in the ecosystem. The runoff from treated roads has the potential to contaminate waterways and substrates that support plant communities; while changing weather conditions due to global warming shorten the cold treatment period that seeds are subject to which may impact seed viability. This study will observe impacts of roadside runoff and cold treatment duration on jewelweed, *Impatiens capensis,* specifically related to seed germination and viability. Research on this topic is relevant and timely as many of these roadsides plant communities function as wetlands, which are particularly sensitive to degradation and invasive species. By answering how roadside runoff and changing climates impacts a common wetland species (jewelweed) in these ditches, we can better assess the health of these ecosystems and their resilience to anthropogenic stressors. We will attempt to answer how roadside runoff impacts jewelweed germination across various treatments by changing cold treatment duration and the salinity of water provided to the seeds. Jewelweed seeds will be collected from various populations and grown in a common-garden experiment. Seedlings will be raised and then watered with a solution containing contaminants, including road-salts, in a randomized complete block design. This work will result in a better understanding of human impacts on ubiquitous but understudied roadside habitats and their associated plant communities.

EFFECTS OF MELATONIN ON HEAD REGENERATION IN THE PLANARIAN *Phagocata gracilis*

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Oral

ABSTRACT:

Most species of planaria as known for their remarkable regeneration capabilities. Upon decapitation, a planarian is able to regenerate a head *de novo* in roughly 2 weeks. Though intriguing, the cellular processes behind regeneration are obscure. However, these processes have been shown to exhibit sensitivity to morphogens, such as melatonin. I examined the short-term effects of melatonin on head regenerates. Subjects were exposed to a 0.25M melatonin solution for 48 and 96 hours and were observed every day for 14 days. Subjects' regeneration process was tracked using a scoring system developed by Beeching and Merritt. My data showed a disruption to regeneration occurred when subjects had a 96-hour exposure to a melatonin solution, but the opposite effects occurred in the 48-hour exposure, with subjects having an increase in regeneration. These data will be used to provide a foundation for regenerative biology and will support ongoing research on the topic.

EXAMINING THE EFFECTS OF ACID MINE DRAINAGE (AMD) ON HSP70 PROTEIN EXPRESSION IN FRESHWATER MACROINVERTEBRATES

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Poster

ABSTRACT:

Acid mine drainage (AMD) is a widely documented mining consequence which involves the infiltration of high concentrations of acid and dissolved metals into surface and groundwater systems. Approximately a third of Pennsylvania's stream miles are negatively impacted by AMD, including heavy impacts within the Slippery Rock Creek watershed (SRCW). AMD leads to drastically altered and highly stressed ecosystems, in which the diversity and abundance of macroinvertebrate species are reduced. Gross population measurements indicate the AMD has lethal effects on freshwater invertebrates. More recently, the sublethal impact of pollution on aquatic organisms has been monitored using molecular markers of stress, including the Hsp70 protein. Notably, these stress indicators are more sensitive and occur at a finer time scale than simple population measurements. Environmental stressors including, but not limited to, elevated pH, temperatures and heavy metals can disrupt the structure and function of proteins, thereby threatening the viability of organisms. To mitigate protein denaturation, organisms utilize a highly conserved stress response system called the heat shock response pathway. The heat shock response pathway triggers the production of the protein Hsp70. This protein is a molecular chaperone that refolds misfolded proteins, helping organisms to survive under proteotoxic conditions. The objective of this study is to determine if Hsp70 protein levels measured by western blotting can be used as a stress marker in freshwater macroinvertebrates sampled from the SRCW. To initiate this study, we are currently determining if freshwater macroinvertebrates express Hsp70 protein following heat shock treatments in the lab. If these experiments are successful, we will examine Hsp70 protein levels in macroinvertebrates in SRCW. In this poster, I will detail my experimental design and preliminary results.

EVALUATION OF MUSE 2 SIGNAL NOISE DURING AUDITORY STIMULATION

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Poster

ABSTRACT:

Brain related research is in demand in the field of Music Therapy. Interest in developing protocols that allow portable, cost-effective EEG devices to be used in clinical practice has emerged. While there are a wide range of such devices on the market, their use requires further assessment before recommendations for use in Music Therapy sessions can be made. One area of assessment involves maintaining signal quality during music related activities. Signal interference can produce noise in the data that makes both processing and interpretation difficult. A prior study in our lab illustrated problems with signal interference during use of the portable Muse 2 EEG headset while participants listened to music via earbuds. COVID- 19 protocols during that study required researchers to be in a separate room, interacting with participants over zoom. Thus, it is possible that the signal interference could have been caused by distance between the recording program (on an iPad with the researcher) and the actual headset (on the participant), presence of extra electrical equipment for zoom, use of Bluetooth earbuds, or unintended movements made by the participant. Therefore, the present study investigates signal quality while brain activity is recorded from the Muse 2 under combinations of various potentially noise inducing conditions, including method of auditory stimuli presentation (earbuds vs external speakers), participant movement (still vs foot tapping), and distance between recording device and Muse 2 headset (same room vs separate rooms). For each condition, the amount of noise and the number of instances in which sensors disconnect is identified. Results of this study not only provide insight into the level of interference produced by movement and musical presentation methods, but also allow for the comparison of in-person vs virtual formats of study completion.

EFFECTS OF DOUBLE-PULSE EXOGENOUS MELATONIN TREATMENT ON *Phagocata gracilis* HEAD REGENERATION

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Oral

ABSTRACT:

Melatonin has been shown to have many regulatory and protective effects in humans, but this hormone is known primarily as a regulator of the body's circadian rhythm. Melatonin is produced across the spectrum of life, in animals, plants, and bacteria, probably as a result of the compound's antioxidative properties. In this study, we investigated the effects of exogenous melatonin treatments on head regeneration in *Phagocata gracilis* planarian flatworms. Planaria are well known for their regenerative properties, and melatonin was previously shown to inhibit their regeneration. However, recent research at Slippery Rock University has found that, under the correct conditions, melatonin can actually be beneficial for planarian head regeneration. In this study, we used 0.25mM aqueous melatonin in a double-blind, double-pulse experiment, administering the melatonin dosages over days 1-3 and days 7-9 of the 14-day trial. Head regeneration was measured over the course of the trial using an established regeneration timeline to determine the progression of head regeneration of each planarian. Determining which pulses have significant effects on regeneration can help us pinpoint the mechanism behind melatonin's effect on regeneration, thereby furthering our understanding of stem cell biology and its possible applications to the human model.

UTILIZING RNA-SEQ TO UNDERSTAND THE MOLECULAR EFFECTS OF SUBLETHAL CONCENTRATIONS OF IMIDACLOPRID ON THE HUMAN CELL LINES SHSY5Y AND MCF7

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Poster

ABSTRACT:

Imidacloprid (1-(6-chloro-3-pyridylmethyl)-N-nitroimidazolidin-2-ylideneamine) is one of the most widely used insecticides in the world. Imidacloprid functions by specifically binding with high affinity to nicotinergic acetylcholine receptors found in the nervous system of insects. Binding of imidacloprid to nicotinic acetylcholine receptors triggers sustained contractions of muscles (hyper-stimulation) leading to paralysis and death. Imidacloprid is a systemic pesticide designed to enter the plant and move into growing tissues in order to prevent insect herbivory.

As a result of the systemic properties of imidacloprid, it is often applied through seed coating, soil drenching and foliar spraying. These applications provide many routes for imidacloprid exposure. Imidacloprid has been found in fresh and processed vegetables and fruit, as well as water, soil and sediments globally. Imidacloprid is described as more selective for insect nicotinic acetylcholine receptors than mammalian due to critical molecular structure differences between species, though evidence is suggesting there are off target effects on vertebrates by this pesticide. Notably, imidacloprid displays sublethal effects on human cells, such as aneuploidy, DNA damage, lipid accumulation and hormone dysregulation. Importantly, not all of the cell lines tested in these studies were acetylcholine receptor expressing cells, reinforcing the idea that the insecticide may have off target effects. Notably, little is known about the molecular underpinnings of the sublethal effects of imidacloprid in human cells. To fill this gap in knowledge, I have initiated a research project to utilize RNA-seq to examine the effect of five sublethal, environmentally-relevant doses of imidacloprid (0.1uM, 1uM, 10uM, 100uM and 1mM) on the expression of genes in the neuroblastoma cell line SH-SY5Y (express nicotinic acetylcholine receptors) and the breast cancer cell line MCF7 (do not express nicotinic acetylcholine receptors). In this poster, I will detail my experimental design and preliminary results.

ANALYSIS OF MELATONIN'S EFFECTS ON THE HEAD REGENERATION OF *Phagocota gracilis IN PERDIODIC DOSES WITHIN A 14-DAY PERIOD*

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Oral

ABSTRACT:

The planaria species *Phagocata gracilis* has the exceptional ability of regenerating damaged or excised body parts following structural injury to its body. In this study, the chemical factor melatonin was introduced during planarian regeneration. Melatonin is known to function as a mediator of both wound healing and disruptor of regeneration. However, much is still unknown about the mechanism of planaria regeneration and the effects of melatonin. I investigated melatonin's effects by performing a series of 14-day trials consisting of 30 worms divided amongst three treatment groups. Using scoring developed by Beeching and Merritt (2019), groups included a control placed in filtered water, a group placed in 0.25mM of melatonin for the entirety of the experiment, and a pulse treated group placed in 0.25 mM of melatonin for days 4-7. This experiment was designed to explore the possibility of critical periods within head regeneration by using pulse application of melatonin. I found evidence that melatonin, in moderation, can be beneficial in head growth when dosed and exposed properly within the course of a 14-day study.

UTILIZING LIVE CELL IMAGING IN DROSOPHILA MELANOGASTER SALIVARY GLANDS TO DETERMINE IF RESVERATROL TREATMENT ACTIVATES HEAT SHOCK FACTOR DNA BINDING

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Poster

ABSTRACT:

There is great interest in understanding the mechanism of action of antioxidant treatments and their cellular effects. Environmental stresses including high heat and oxidants can disrupt the structure and function of proteins, thereby threatening the viability of organisms. To mitigate this, organisms utilize a highly conserved stress response system called the heat shock response pathway (HSR). This pathway is activated when the transcription factor, heat shock factor (HSF), binds to the Hsp70 gene and triggers the expression of the Hsp70 protein. This protein is a molecular chaperone that refolds misfolded proteins, helping organisms to survive under proteotoxic conditions**.** HSR activation also leads to an increase in reactive oxygen species (ROS), which can damage cellular molecules, including proteins. To combat this, cells utilize endogenous antioxidants to scavenge free radicals through redox reactions. Therefore, we previously examined the impact of feeding an exogenous antioxidant, resveratrol, on the ability of wildtype Drosophila to withstand heat stress. Strikingly, 100uM and 400uM resveratrol increased the ability of the flies to withstand heat stress-induced paralysis. We hypothesize this result is consequence of HSF activating the HSR. To assess this, we examined the impact of resveratrol (100 uM, 200 uM and 400 uM) on HSF-GFP binding at the Hsp70 gene using confocal microscopy. This binding event was imaged using the giant polytene chromosomes of living Drosophila salivary gland cells. The results of these experiments show that resveratrol does not trigger binding of HSF to the Hsp70 gene. Thus, our preliminary data indicates resveratrol treatment does not lead to activation of HSR. To test our hypothesis more directly, we are currently examining the levels of Hsp70 protein in cells treated with resveratrol by western blot analysis.

Chemistry

EFFECTS OF ISOLIQUIRITIGENIN ON MITONEET EXPRESSION IN NEURO 2A CELLS

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Poster

ABSTRACT:

Alzheimer's disease is a neurogenerative disease characterized by the formation of amyloid beta proteins and affects more than 6 million Americans. The slow buildup of these proteins is tied to symptoms including memory loss, increased aggression, and disorientation. There is no definite cause or cure for AD, but there are limited treatments to help relieve symptoms. One approach addresses mitochondrial dysfunction, where the mitochondria release reactive oxidative species that lead to damage and/or changes to tissues, genes, and proteins. MitoNEET is a mitochondrial protein that is thought to have a role in bioenergetics and mitochondrial oxidation capacity. Isoliquiritegenin (ISL) is a cancer treatment that targets mitochondrial dysfunction by inhibiting mitoNEET expression and inducing apoptosis. Fluorescence microscopy was used to evaluate mitoNEET expression using a genetically modified protein, mitoNEET-GFP. Neuro 2A (N2A) cells, a mouse neuroblastoma, was transfected for 24 hours with mitoNEET-GFP at a concentration of 150 ng/μL. The cells were exposed to ISL for 24 hours then imaged. The initial results, measured in fluorescence intensity (au), show a decrease in mitoNEET expression from 235 au to167 au with 0.5 μM, 165 au with 5 μM, and 142 with 50 μM ISL. Further studies will investigate the effect of mitoNEET on cell viability and ROS production.

EVALUATION OF THE EFFECTIVENESS OF PASSIVE TREATMENT SYSTEMS FOR ACID MINE DRAINAGE IN THE SLIPPERY ROCK CREEK WATERSHED, WESTERN PENNSYLVANIA

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Poster

ABSTRACT:

Acid Mine Drainage (AMD) from coal mining has impacted the Slippery Rock Creek Watershed in western Pennsylvania for the past two hundred years. In the late 1990s, a combined group of State agencies, local environmental groups, and universities installed a series of Passive Treatment Systems in the headwaters of Slippery Rock Creek to treat AMD discharges from abandoned coal mines and oil wells. There were multiple goals for these Passive Treatment Systems:

1. Geochemically remove dissolved metals in the AMD.

2. Reduce the acidity and increase the alkalinity of the AMD.

3. Accomplish this within the Passive Treatment Systems before the AMD reaches the receiving stream.

In addition, the system effluent would make the stream more tolerant of untreated AMD discharges that enter it.

Our project's goal was to explore both the overall historical trends and the current state of the water chemistry of the Slippery Rock Creek watershed since the installation of the passive treatment systems. Thirteen sampling points were established in the receiving streams in the late 1990s to monitor the impact of the construction of the Passive Treatment systems. They have been sampled almost thirty times over the past twenty-seven years. We sampled them most recently during the Fall of 2022 and plan to sample them during the spring of 2023. The project will also provide insight into the effectiveness and operational status of the Passive Treatment Systems within the watershed by sampling the sources and outfalls of AMD passive treatment sites. Additionally, the project uses sUAS (small unmanned aerial systems) to detect AMD seeps and complete aerial surveys of Passive Treatment Sites to determine the operational status of the systems.

Civil Engineering

DEWATERING AMD SLUDGE WITH EKG

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Poster

ABSTRACT:

Acid mine drainage (AMD) has been a concerning problem since the industrialization of coal mining. Research has shown that coal-derived AMD contains a significant concentration of Rare Earth Elements (REE). Thus, exploring the coal-derived AMD to generate REE can provide a profitable operation. To prepare the AMD for REE extraction, a substantial dewatering process is necessary. Therefore, this research investigates a cost-effective way to dewater AMD sludge for REE extraction using electro-osmosis. Electro-osmosis is a technique that uses an electric current to induce water movement. In this research, we use an electro-osmosis bench-scale cell to evaluate the effectiveness of the technique to remove water from REE-rich sludge produced from AMD.

Computer Science

EMPLOYING BLOCKCHAIN FOR CROWDSOURCED DATA ANALYTICS

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Poster

ABSTRACT:

As we move towards the new convergent computing platforms, such as, crowd computing and more, along with a paradigm shift in big data applications leveraging on crowdsourcing model, it provides both challenges and opportunities for research community to develop, deliver, support, and prepare a diverse set of solutions utilizing emerging technologies to ensure reliability, management, and security of the crowdsourced data. Moreover, given the security concerns, not all of the crowds participating in problem solving can be granted access to the sensitive and complex datasets, such as data from government laboratory. One of the most significant benefits of the blockchain technology is its inherent resiliency and capability to facilitate digital trust between counterparties. The blockchain technology aids in building tamper-proof digital vaults for protecting connected users/ devices, and in defining access control along with privacy permissions in various systems, such as data crowdsourcing system. This poster presents a decentralized data access and control framework to handle data crowdsourcing from Operations Monitoring and Notification Infrastructure (OMNI) infrastructure at the National Energy Research Scientific Computing Center (NERSC) at Lawrence Berkeley National Laboratory using blockchain technology. Our proposed system will provide a managed and trusted platform for researchers to get an easy access to real-time operations data while managing not only the confidentiality, integrity, and availability (CIA) triad but also the traceability of the crowdsourced information. The proposed framework will be integrated with OMNI infrastructure and will be used to crowdsource operational data to the users external to NERSC or Berkeley Lab.

Dance


fine art
america

AN INVESTIGATION OF RACE, GENDER, AND QUEER THEORIES IN NUMEROUS VARIATIONS OF TCHAIKOVSKY'S *SWAN LAKE*

Tyler Anderson

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Oral

ABSTRACT:

As Western concert dance has evolved to include progressive ideas, bodies of color, and Queer bodies, historic structural barriers remain in place that restrict these bodies from being shown on a proscenium stage. Be it a person's race/ethnicity, gender expression, or sexual orientation, certain individuals have continued to face discrimination in a discipline that promotes self-expression as White, heteronormative bodies have often hoarded the spotlight and program notes. Tchaikovsky's *Swan Lake* has been adapted from Petipa's original choreography by various organizations, such as Les Ballets Trockadero de Monte Carlo and Sir Matthew Bourne's New Adventures, that actively combat traditional notions held throughout the ballet world. Analyzing dance through the lenses of Gender Theory, Queer Theory, and Critical Race Theory shines a light on the ways in which political ideologies and beliefs held off stage affect what is presented on stage and those presenting it. In my essay, I will introduce the concepts of intersectional discrimination and oppression and apply them to one of the most widely recognizable works in classical ballet repertoire, Pyotr Ilyich Tchaikovsky's *Swan* Lake. This examination will support my claim that historically, dance has been a segregated and patriarchal field, yet that has not stopped individuals with marginalized identities from performing, creating, producing, and distributing works to various audiences. Inspirations from the time periods in which the works were created, such as the socialization of women in the late 1800s, will also be dissected to attest to the motivations behind the works and choreographers and how they have been challenged. I will also examine the various stigma management tools utilized by these companies, and further examine who, ultimately, these decisions favor. This synthesis will expose the various ways discriminatory behaviors creep into dance settings, the effect they have on those involved, and the audiences' responses to them.

PAPER WINGS: A CORPOREAL DEMONSTRATION OF FEMINISM

Auriana Carrington, Jordan Allen, Autumn Bulebush-Clouse, Olivia Blankenship, Kali Booker, Jaidin Broody-Walega, Alexandria Capone, Olivia Farmerie, Austin Shaffer, Kaylee Smith, Lily Staib, Tori Steel, and Hayden Summers

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Oral

ABSTRACT:

As part of a Faculty Student Research Grant, Helen Simoneau restaged her work *Paper Wings* on a group of 14 dance majors within the Department of Dance. This piece is grounded in feminist theory, and questions the politics of females taking up space. Students had first-hand experience of working with an established choreographer, underwent the rigger of Simoneau's choreographic aesthetic, and deepened their understanding of themes presented in this work via theoretical research. In this research presentation, dancers from this choreographic residency will share with the SRU community the values of Helen Simoneau Danse and her feminist work *Paper Wings*.

THE MAN WHO COULD DO IT ALL: THE MULTIDISCIPLINARY TALENTS OF GENE KELLY THROUGH *ANCHORS AWEIGH*

Alicea Chludzinski

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Oral

ABSTRACT:

"I wanted to do new things with dance, adapt it to the motion picture medium". Eugene Curran Kelly, better known as Gene Kelly, was a dancer, singer, actor, choreographer, and director who became an American cultural icon for his work in Hollywood with the genre of musical comedies. Some of Kelly's most popular films include *Singin' in the Rain* and *An American in Paris* where he is seen as an outstanding and charismatic performer, but what is lesser known about Kelly is his work behind the scenes for these films and many others. Along with being the lead performer in many films, he also served as the choreographer for the dance sequences and often co-directed or collaborated with other filmmakers to reinvent the American Movie Musical. I argue that Gene Kelly's ability to work both in front and behind the camera contributed to the overall success of the 1945 film *Anchors Aweigh.* In this paper, I will specifically analyze Kelly's work with choreography in relation to the camera and special effects as well as his performance throughout the film.

SUPPORTING GENDER NON-CONFORMING YOUTH IN DANCE EDUCATION BY CREATING A GENDER INCLUSIVE ENVIRONMENT

Grace Larson

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Oral

ABSTRACT:

The dance world is constantly evolving in terms of inclusivity and acceptance of people. There is a shift in the dance field as stigmatization of gender identity diminishes, and the gender binary construct in concert dance is challenged. Because of this change, dance pedagogy in studios should also evolve to support students' gender identities. Numerous dance studios fall into the traditional gender binary approach such as gendered movement vocabulary and gendered costuming. Most dance students are expected to wear costumes and perform movements based on their sex at birth. As children develop and grow, they begin to explore their identity. Many children use their hobbies and interests, like dance, to help define their identity. Dance is an art form that concerns the body and helps people find their self-expression, therefore challenging the gender binary in studio settings is beneficial to the growing youth. It is important for dance educators to facilitate inclusive environments and promote changes in their studios in response to changes in the world. An understanding of gender identities is the first step towards change in dance studios. The next step is relating the gender identity information to youth by analyzing gender identity patterns as they grow and develop. Dance, being an art form that concerns the body and expression, facilitates youth in finding their identity. Therefore, dance educators must recognize the often hidden but present gender constructs in studio dance and find ways to challenge the binary approach: doing so will create an inclusive environment where students can express themselves in an authentic manner. I argue that youth dancers can find their self-proclaimed identity through dance, therefore, creating a gender inclusive environment in dance studios is key in supporting the growth of dancing children.

DANCE AS COMMUNICATION: ACCESSING THE DEEPLY COMMUNICATIVE ABILITIES OF DANCE TO FOSTER UNIVERSAL EMPATHY

Rachel Male

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Oral

ABSTRACT:

Dance fulfills a multitude of roles for humanity. For some, dance is a recreational activity, while for others it is the way they make a living. It has been used as a form of therapy, competition, entertainment, advertisement, exercise, cultural expression, and more. With dance serving such a wide array of purposes, it becomes easy to overlook the capacity dance has to covey meaningful messages that spark empathy, unity, and societal progression amongst humanity. In this presentation, the role of dance as a form of communication is examined, along with what makes it a unique and effective alternative to other mediums. The capacity for dance to convey human emotion with a precise level of accuracy is discussed, supported by the neurological findings that enable these emotions to be perceived. The considerations necessary to effectively communicate through dance and the resulting benefits of doing so are also advocated for. In pursuance of using dance to its fullest potential, dancers, choreographers, audience members, and the general public must recognize the deeply communicative abilities dance has to convey powerful expressions of the human condition. Arguments made in this presentation are all supported by peer reviewed research and published dance books. In response to this research, movement research is also being conducted to create a dance communicating the universal feeling of the buildup of emotion before breaking tough news to someone. This dance will be completed in April, and a video of it may potentially be shown along with the verbal presentation.

CHOREOGRAPHING AND PERFORMING HUAYÑO COCHABAMBINO

Natalia Siles Cohello, Andres Ortiz-Mendoza, Kaylee Smith, Auriana Carrington, Austin Shaffer, Tyler Anderson, Alia Anton, Lia Palermo, Will VanSlander, Lily Staib, JayElle Dunning, Taylor Snyder and Katie Baughn

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Performance

ABSTRACT:

Our main research interest lies in the examination of Huayño Cochabambino, a Bolivian dance that has been practiced for over 500 years in the Andean region of Bolivia. This dance is characterized by presenting a cheerful and picaresque game of seduction between men and women. Male dancers incorporate agile and vigorous stomping as he ascends onto the woman. He proceeds to gently brush his partner with his shoulders as he turns. This dance features a vast amount of footwork and turns. Another important characteristic of this dance is the manipulation of costumes for both men and women. The Huayño Cochabambino was an exclusive dance of indigenous groups from Bolivia which changed the social strata over time. The origin of the Huayño is pre-Hispanic and came to have immense importance in the Inca empire. Its history is partially revealed in the dance, in its movement vocabulary and choreographic patterns.

Through investigation, we have examined the existing connections between the history of the dance and the dance itself. We asked if the dance was a literal reenactment of the story behind it, or instead, an abstract approach with only generalized references of the historic source. This project additionally includes a practical component where we transmitted both the historic and choreographic aspects of the dance to SRU dance majors for performance purposes. In our research, we argued that dances that are closely connected to their culture of origin should be learned and taught considering both their historic and choreographic components.

Elementary Education and Early Childhood

STUDENTS' PERSPECTIVES OF BRITISH FOREST SCHOOL IN RURAL PENNSYLVANIA

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Oral

ABSTRACT:

This project focuses on intertwining crisis preparedness with community relations. The incorporation of two dynamic fields of public relations sets Airbnb apart from similar companies, Along with SRU faculty, we conducted research with a British Forest School located in Meadville, Pennsylvania. Before conducting our study with students attending the forest school, we completed a literature review in which we read about forest schools in the United States and Great Britain. A "forest school" can be described as a child-centered inspirational learning process that offers opportunities for comprehensive growth through regular sessions and hands-on experiences in a natural setting. From there, we collected forest school students' journals and photographs to determine their overall perspectives on forest school. We then took this data and found common themes, examining thematic similarities and differences between age groups. We then presented our findings at the Hawaii International Conference on Education in January, 2023.

PROFESSIONAL IMPACT: INTERDEPARTMENTAL COLLEGIALITY FROM THE UNDERGRADUATE STUDENT PERSPECTIVE

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Poster

ABSTRACT:

Collegiality in the education field is a significant component of professionalism. Research indicates that without proper role models to exemplify collegiality, new teachers may begin their careers at a disadvantage. The ability to be a good colleague can be an important piece to the successful transition of the student to teacher paradigm shift. Additionally, pushing back on traditional societal views of competition, and "every person for themselves" in favor of collective success can have a domino effect as new teachers approach their work with peers in a collaborative fashion.

This poster presentation will focus on one teacher education program in Pennsylvania from the student perspective. Personal experiences that illustrate types of collegiality observed in the department will be shared, how collegiality is exemplified in through class sessions, and connections made between faculty collegiality and our personal development as pre-professional educators.

Through the illustration of research informing practice, discussion on topics such as identifying components of collegiality, how non-collegial behavior can impede professional progress, the complexity of workplace relationships, and how gender can affect these relationships will be encouraged. Discussion points will highlight ways to promote inclusivity in our community through student perspectives.

Collegiality is a topic that has been addressed in educational research, but to a minimal degree, and very little literature exists that makes specific connections between the impact of collegiality in a teacher education program and the students in the program. For example, departments with more positive collegial relationships can collectively advocate for student needs with greater effectiveness.

Through interviews and personal experiences, every professional has different experiences that can be shared. We welcome participants to share their experiences, listen to those of others, and reflect on how collegiality has sustained impact within their teacher education programs.

Exercise Science and Athletic Training

COMPARISON OF MUSCLE ACTIVATION DURING THE PLANK, FARMERS CARRY, FARMERS HOLD, SUITCASE CARRY AND SUITCASE HOLD

Kaitlyn Bergmann, Samuel Ellestad, Thomas Holcomb, Autumn Hultberg, Madison Nehlen, and Jonas Chan

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Poster

ABSTRACT:

The plank is an exercise that activates the core muscles. The 'loaded carry' is a movement pattern where an individual picks up a weight and walks a specific distance. Similar to a plank, carries activate the core muscles, but across multiple movement planes while the body is in motion. 'Holds' are similar to carries, but, like planks, lack a locomotive aspect. Both carries and holds can be completed bilaterally (farmer's carry (FC) and hold (FH)) or unilaterally (suitcase carry (SC) and hold (SH)). A deeper understanding of muscle activation during intensity-matched planks, carries, and holds might improve their application. Healthy, college-aged individuals were recruited and surface electromyography of the rectus abdominis (RA), external oblique (EO), longissimus (LT), and multifidus (MF) was measured bilaterally using standard procedures. Participants completed time- and intensity-matched randomized sets of the plank, FC, FH, SC, and SH separated by 5-minute rests. A one-way ANOVA was utilized to compare core muscle activation across exercises. The plank elicited greater RA activation than both holds and carries ($p < 0.05$), but similar EO activation to the SC and SH (average 25.3±0.95 kg in one dumbbell). The FC (average 50.7±1.9 kg across equally-weighted dumbbells) elicited higher activation bilaterally in the RA, EO, LT, and MF, compared to the FH ($p < 0.05$). There was greater activation bilaterally in the LT and MF during the SC compared to the SH ($p < 0.05$). However, the unweighted side of the SC, the RA and EO displayed greater activation than the SH ($p < 0.05$), but muscle activation was not different in the weighted side ($p > 0.05$). Planks may be promising towards strengthening the RA, whereas the plank or unilateral exercises (SC and SH) increase EO activation. Finally, individuals may see more comprehensive muscle activation in a carry over a hold.

THE EFFECT OF LOW-INTENSITY BLOOD FLOW RESTRICTION EXERCISE ON CARDIOVASCULAR FUNCTION IN COLLEGE-AGED MALES

Sarah Hess, Sarah Davidson, Riley Goerner, Erin Moyer, Lindsay Jones, Jacob Jedry, Ella McDonald, Emily Opfer and Abigail Williamson

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Oral

Low-intensity, blood flow restricted (BFR-LI) training is becoming a popular rehabilitation and sport performance methodology that aims to produce a similar result as high-intensity resistance training. By occluding blood flow from the muscle, a smaller workload can be used in individuals who may have issues with high-load training. Previous research has investigated pre- and post-surgery differences in muscle fiber growth utilizing BFR-LI, and reported its efficacy as a rehabilitative protocol. However, there is contradictory evidence, regarding the concurrent use of exercise and blood flow restriction, and it appears to be intensity- and occlusion-pressure dependent. Therefore, the purpose of our study is to determine the effect of an acute bout of BFR-LI on blood pressure and hemodynamics in normotensive, college-aged males. Apparently-healthy college-aged males will be recruited to participate in our study. Participants will complete a 3-5 repetition maximum (RM) test to estimate their 1RM on a leg extension machine. Participants will attend three volume-matched training sessions, completing one of the following protocols: 4 sets each of 1) high intensity- 70% 1RM for 8 reps; 2) low intensity- 35% 1RM for 16 reps, 3) BFR-LI- 35% 1RM with 50% venous occlusion for 16 reps. Sessions will be assigned randomly, and a 5-minute light-intensity treadmill warmup will precede each session. Sets will be separated by one-minute rest periods. Cardiovascular response variables, including bilateral blood pressure (SunTech Tango) and non-invasive hemodynamic measures (Physioflow) will be taken pre-exercise, after each set, and 2 minutes post-exercise.

CHANGES IN LOADED CARRY MAGNITUDE AND ITS EFFECT ON STRIDE LENGTH AND CORE MUSCLE ACTIVATION

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Poster

ABSTRACT:

Loaded carries is a movement pattern where an individual picks up a weight and walks for a specific distance. Because of the rigor loaded carries have become a popular form of resistance exercise and training. Exercises like the farmers carry, where the weight is held in both hands, have been shown to activate the core muscles across multiple planes of movement. However, with regard to application by clinical and fitness practitioners we found little research on the implications of simple changes in loaded carries in being used to meet the needs of clients to achieve training goals. This study will fill this research void by examining how changing the load of a farmers carry affects muscle activity and stride length. Healthy, college-aged individuals will be recruited and their body composition (i.e., %fat, fat-free mass (FFM)) will be measured. Surface electromyography (EMG) procedures will be used to measure the level of muscle activation of important core muscles (rectus abdominis, external oblique, longissimus, multifidus). Participants will be videotaped and fitted with inertial measurement units (IMU) to capture joint kinematics while completing randomized trials of a 20-meter walk with: 1) no external load, 2) 75% FFM, 3) 100% FFM, and 4) 125% FFM. Inferential statistics will be used to analyze differences in muscle activation (EMG activity) and stride length within the participant trials. The results of the study will lead to an improved understanding of the implications of load carry on human movement patterns.

THE USE OF TART CHERRY JUICE FOR MUSCLE RECOVERY IN FEMALES

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Oral

ABSTRACT:

Exercise can cause muscle damage due to an increase in inflammation and oxidative stress within the body, with a greater intensity of exercise contributing to severity. Symptoms associated with exercise-induced muscle damage include muscle soreness, swelling, and pain, and these may limit future exercise participation. Tart cherry juice (TCJ) may alleviate some of the symptoms mentioned above, due to its potent antioxidant and anti-inflammatory properties. Research has suggested that TCJ may promote muscle recovery following intense exercise, though data on females are lacking. Therefore, we are currently in the process of conducting a randomized, counterbalanced protocol to assess the effects of TCJ supplementation on muscle recovery and inflammation following intense resistance training exercise in young, healthy females. We hope that this work may contribute to the conversation regarding recovery in sport, rehabilitation, and leisure exercise participation.

Finance

BREAKING THROUGH BARRIERS: WOMEN IN FINANCE

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Poster

ABSTRACT:

Recent pushes for gender equality have helped to shrink gender gaps across the world. Despite these efforts for equity and inclusion, the financial sector is still heavily dominated by men. This disparity is increasingly visible while moving up the industry ladder. Looking at banking, women make up over half of the entry level workforce, but when progressing towards C-suite positions, the number of women that make up the workforce continues to decrease (Ellingrud et al.). In banking, women make up less than one third of the workforce at the SVP and C-suite level (Ellingrud et al.). Discrepancies like this can raise questions as to why, at a time when gender gaps around the world are closing, the finance industry's remains so large. To better understand the gender gap, an analysis will be performed on the factors that contribute to the gender inequity. Also, we will examine how increasing the number of women in the workforce can improve business performance. Through the utilization of peer reviewed journals and scholarly articles, the purpose of this research is to examine the existing gender gap and demonstrate the importance in reducing it.

Geography, Geology and the Environment

CHARACTERIZATION OF AEOLIAN SEDIMENTS AT SEVERAL LOCALITIES IN THE WHITE RIVER BADLANDS

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Poster

ABSTRACT:

As part of our first geological field work, we sampled and described four stratigraphic sections of wind transported sediments, aeolian, deposited upon tables in the lower prairie of badlands proximal to the White River, in South Dakota. Our Fieldwork revolved around the locality we call Skull Table, which lies just south of SD 44 near Imlay. Our objectives include gaining insight into provenance, determining the timing of deposition, and, potentially, correlating with intervals of aeolian activity and pedogenesis at other localities across the northern Great Plains. By comparing our samples to other localities geochemically, we can find the origin of the sediments that were deposited at skull table. Across the White River Badlands, mesas are typically called tables, while sod tables are smaller remnants of dissected pediments that lie adjacent to the larger tables. Exposures at this locality allow easy access to past depositional environments and correlated fossilized soil layers, paleosols, with previously collected samples. These exposures reveal 8-12 m of aeolian cliff-top deposits on the northern, windward edge of the table, thinning to 2-3 m at the leeward edge. At each locality, silt and sand beds were measured, described, and sampled for particle size analyses, and, for a subset, radiocarbon dating of bulk humate. Radiocarbon ages show deposition at the transition from Pleistocene to Holocene Epochs. Particle size analyses were completed for the Skull Table samples which show abundances of sand, silt, and clay. The results show sand abundances with an average of 61%, silt with an average of 31%, and clay with an average value of 5%. Through these ongoing investigations of the White River Badlands, we seek to document significant intervals of aeolian and fluvial deposition, with effort to understand their paleoclimatic causalities.

History

JULY 3rd, 1863 – ONE WRONG CHARGE TO CHANGE THE COURSE OF HISTORY

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Poster

ABSTRACT:

Many who study history could question to what extent would we follow someone blindly into disaster. To try to answer this, one could question why General Robert E. Lee was held to a high standard that his troops would charge into the open battle field of Gettysburg without expressing their concerns and making sure their voices were heard. "Pickett's Charge", a military strategy performed by the Confederate Army under General Lee's command at the Battle of Gettysburg showed the power that one's loyalty to their leader can have and still has on us today. Pickett's Charge was the poorly planned operation for the Confederate Army to charge the Union Army's center line in one last attempt to take Gettysburg, Pennsylvania as the first southern base in the North during the American Civil War.

By using letters from General Pickett and General Longstreet, interviews with General Lee, and Newspaper articles from this time period, this study argues that even though labeled a "Military Genius" General Lee ignored the warning signs of the disaster his men were marching into. One account shows that General Longstreet was so torn with obeying orders or stopping what he could see would be the end, he wrote to General Pickett that he could not give the order for the charge to begin, instead giving that job to General Alexander to give the final order. With pride and not a second though, the Confederate Army would begin their march across the open field in plain sight against their enemy's heavy artillery. In just under an hour of fighting, over 6,000 Confederate troops lost their lives, marking the Battle of Gettysburg one of the bloodiest battles and the turning point to the American Civil War.

Languages, Literatures, Cultures and Writing

THRIVING: SHOWCASING UNDERGRADUATE WRITERS IN THE COMMUNITY

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Oral

ABSTRACT:

How do undergraduate writers find and nurture creative communities during college and re-emerge from the isolation of the pandemic classroom? Creating off-campus artistic/writing communities and residencies working with underserved populations—adults in recovery, students in high schools—all offer deeply rewarding experiences. Two undergraduate creative writers who participated in off-campus writing residencies serving adults in recovery and high school students will discuss their experiences, play excerpts from gathered oral histories, and showcase the resulting anthology by the writers. They will discuss these off-campus experiences both in terms of successes (and challenges) in moving students beyond the classroom.

DEAR, READER

Isabella Jones

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Oral

ABSTRACT:

Objectives of this Project: This literacy program titled *Dear, Reader* aims to engage with the community through civic activity and foster a love of reading through YA texts. In 2002 the international *Reading for Change* report found that students who read for pleasure tended to score higher on literacy exams, and researchers Bussiere et al. noted the same results for Canadian students on the international PISA test for reading, regardless of their socioeconomic status. Vivian Howard, a researcher with Dalhousie University, noted these results in her own study where she confirmed that indeed, pleasure reading has academic, social and emotional benefits, helping teenagers in "the transition from childhood to adulthood" (*JoLiS,* 2011). The objective of this project is to put this research into practice by offering the materials and space for pleasure reading.

Purpose: To collaborate with a regional high school (McDowell High School in Erie, PA) and one of their dedicated in-service teachers to offer free, personal copies of age appropriate and engaging Young Adult novels as well as activities and discussion questions to dive deeper into the text.

Methodology: To promote the program in the school prior to its initial start date in which students will have the chance to sign up for *Dear, Reader*. Take this count of students and order the appropriate number of books. Each student, regardless of what is covered in allotted time for the program, will receive all five books by the end of *Dear, Reader*.

Outcome: The outcomes of this project are still unknown as we have yet to start; our presentation for the symposium will include the many hurdles we faced in getting this program started, and possible reasonings as to why.

MEDIA SCAPE-GOATING OF MONICA LEWINSKY

Jenna Lubinski

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Poster

ABSTRACT:

Scope: This presentation gathers political cartoons and satirical performances from the late 1990s to the early 2000s which scape-goated Monica Lewinsky for the former President Clinton's predatory sexual abuse.

Means/Methodology: Close reading political cartoons and satirical performances distributed by mainstream news and entertainment sources, I apply a structural approach to understanding victim blaming in high profile sexual harassment cases like Lewinsky's to perpetuate a culture where victims were afraid to report.

Results: Professional women who are involved in scandals with men in high positions of authority tend to become the scapegoat for powerful men's wrongdoings, especially those of a sexual nature. An iconic example is former President Bill Clinton's coercive affair with the young intern Monica Lewinsky and the media scrutiny she received. This presentation will connect the patriarchal abuses in the executive office and workplace with media representation of women in highly publicized sex scandals through the offensive and brutal political cartoons and social satire television skits that made Monica Lewinsky a scapegoat for the affair and generated profit for multimedia corporations. The cartoons and stills of television programs demonstrate how the media dismantled her character and reputation. Lewinsky's defamation preceded the #metoo movement which highlights the suppressed voices of women who are the victims of sexual harassment in the workplace and how common the experiences are. Lewinsky is only one example of maligned women who were victims but bullied by the media, a common narrative that literature by and about women portrays.

LIFELONG BENEFITS OF LEARNING ANOTHER LANGUAGE: CURRENT VIEWS & PERSPECTIVES

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Oral

ABSTRACT:

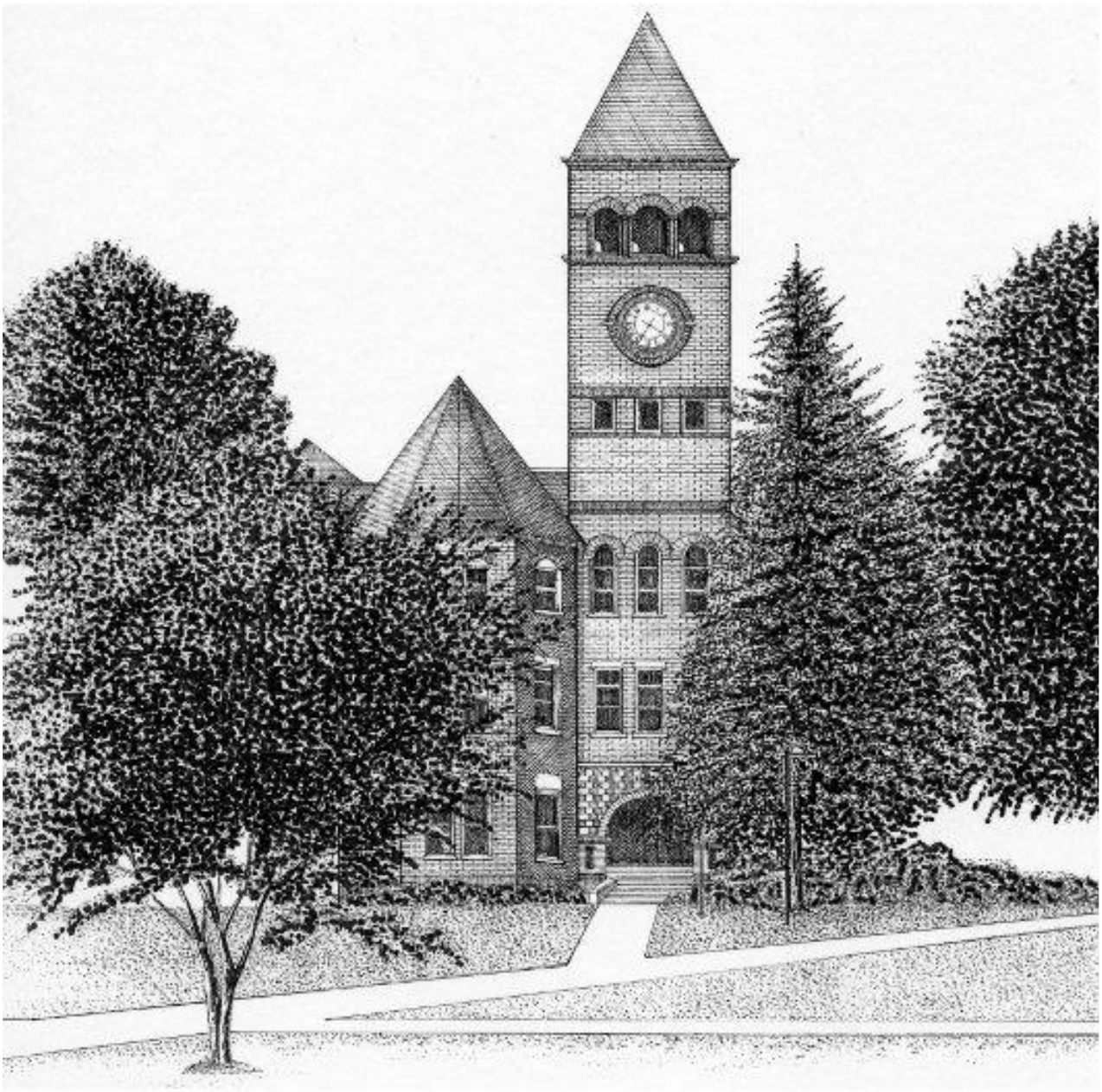
The research stems from my personal observation that a number of students from various levels of college are neither taking nor appreciating the value of another language. The goal of this research is to understand students' views of foreign languages, as well as those of professionals who recently retired. The research involved a 12-question survey and personal interviews of faculty and current/retired professionals and was completed in the fall of 2022 involving roughly 200 respondents.

While a total of 57% of respondents indicated an interest in learning another language and 30% expressed the possibility of learning another language, only 25% of the respondent experienced a foreign language at a collegiate level. Also, the data revealed that 97% of respondents have indicated that they have met a person who speaks another language.

According to the survey, 57% of the respondents indicated that they are interested in learning another language, however they have not taken a language yet. Given the established lifelong benefits of a second language, my research shows that the majority of students do not appear to recognize/integrate that as they pursue college education.

Even though students are now enrolled in college or people are retired from a lifelong career, it is not too late for anyone to learn another language because of the nature of the benefits of foreign languages, students should consider a second language as they start their college experience.

Mathematics and Statistics



CONSTRUCTING MANIFOLDS FROM THE BIPYRAMID

Elijah Saesan

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Oral

ABSTRACT:

We introduce face pairings, starting with 2 dimensions and then building to 3-dimensional space. Then we explore face pairings on a bipyramid and consider which combinations of subdivisions and twists can be used to create a closed 3-dimensional manifold. We go on to consider the different types of geometries these manifolds can take on, and present new examples of hyperbolic 3-manifolds discovered through our analysis. The computational software program Regina is used throughout our analysis.

Mechanical Engineering

DEVELOPMENT OF AN AUTONOMOUS LOW-COST ADDITIVE MANUFACTURING PRODUCTION LINE

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Poster

ABSTRACT:

Additive manufacturing (AM) has been developed to create complex structures that a common manufacturing processes cannot easily achieve. However, mass production is still one of the challenges in additive manufacturing due to print size constraints, material constraints, and manual printing removal processes. This relationship is known as quantity vs. variety and is a major problem in classical manufacturing processes.

The goal of this research is to integrate separate systems such as a 3D printer, conveyer belt, and a robotic arm to achieve a more efficient manufacturing process. This system should be capable of attaining both quantity and variety by using this method. The 3D printed parts peel off from the bed, trigger a sensor, are retrieved by the robotic arm, and sorted into designated bins on the conveyer.

The results of the research achieved a 90% success rate in the goal to automatically relocate and sort parts. This provides a strong indication that this process is capable, if tweaked, to be reliable enough to achieve mass production with a large part variety. The importance of additive manufacturing for use in this process cannot be overlooked due to the capability of one machine that is able to produce parts with varying materials, colors, sizes, shapes, etc.

Following this research, future works would include installing AMS systems, increasing quantity further, and achieving a flow of raw material to finished goods with no human interaction while maintaining a high variety of parts. The drawbacks to this system would be the lack of capability to produce high strength engineering materials as well as metal parts. However, the integration of systems to achieve autonomous production could be applied to more expensive additive manufacturing processes and yield similar results!

Music

BARRIERS TO HIRING MUSIC THERAPISTS IN WESTERN PENNSYLVANIA

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Poster

ABSTRACT:

Despite music therapy having a significant amount of research and evidence of its effectiveness with older adults, music therapy is one of the most underutilized forms of musical engagement with older adults. The purpose of this project was to determine what barriers there are in hiring music therapists in eldercare facilities throughout western Pennsylvania and how to best advocate for music therapy services in this setting. In this research survey, I share the responses of 21 administrators, directors, and other decision-makers of eldercare facilities in western PA and their experience of having or not having music therapy at their facility. Surveys were sent to assisted living (n=6), skilled nursing (n=6), memory care (n=7), home health (n=1), independent living (n=3) personal care (n=4) and hospice (n=7) facilities (some responses were for multiple facility types). The four barriers identified to hiring music therapists include in order or prevalence: budget restrictions (53%), availability of volunteers to provide music therapy (23%), lack of music therapists in their area (15%), and cost of music therapy services (8%). For those facilities that have music therapy services, the most prevalent reason for hiring a music therapist was the recognized benefits of music therapy services. One notable finding from the study was that of the facilities who identified as having a music therapy program at their facility, 36.35% of them do not have a board-certified music therapist providing music therapy services. Based on the results of this research, more education needs to be done in the community and the healthcare field regarding accessibility and affordability of music therapy services. There also needs to be more advocacy for hiring board-certified music therapists in these facilities, education about what music therapy is, and who is qualified to provide music therapy services.

Nonprofit Management, Empowerment and Diversity Studies

AN ASSESSMENT OF THE 2025 NONPROFIT WORKFORCE NEEDS

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Poster

ABSTRACT:

For over a decade, headlines have claimed that there is an impending crisis in nonprofit leadership due to the retirement of the baby boomers. While previous economic downturns have delayed retirements, the pandemic related recession accelerated people leaving the workforce (Fry 2021). Given these changes, it is critical to understand the current and projected needs of nonprofit organizations. These include anticipated staffing changes, along with the types of skills that are valued in prospective employees. This information can be used to update or create curriculum for university degree programs along with professional development. Using a survey of nonprofit organizations, focus groups and interviews, we have gathered information that identifies where the largest anticipated gaps are expected, along with the general and specific skillsets that nonprofits are looking for both now and in the future.

Occupational Therapy

THE EFFICACY OF UTILIZING THE GROUP MODE OF TREATMENT DELIVERY IN OCCUPATIONAL THERAPY FOR SKILLED NURSING FACILITY SETTINGS

Katie Ashbaugh, Amber Bowser, Emily Campisi, Byron Heinbach, Morgan Gleixner and Allison Snak

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Poster

ABSTRACT:

Purpose: A new payment model enables occupational therapists (OTs) working in skilled nursing facilities (SNFs) to provide up to 25% of treatment in group settings despite limited research in this area. Researchers inquired, will patients participating in individual and group treatment sessions in SNFs have the same/better or worse functional outcomes than those receiving only individualized OT? Are patients satisfied with this approach?

Design: This quasi-experimental, two-tailed research study recruited patients with orders for group and individualized OT sessions in six SNFs. Data mining enabled formation of a comparison group with similar baseline characteristics receiving only 1:1 treatment.

Methods: A priori power analysis revealed a need for 74-148 participants to achieve data saturation. Six researchers developed an evidence-based group protocol which they provided up to 1x/week for a maximum of 10 weeks. Researchers extracted CARE Item Set data from 85 experimental participants' OT evaluation and discharge reports and administered a Likert-based satisfaction survey to the experimental group after an individual and group session. Researchers analyzed data using a two-tailed t-test.

Results: N=85 (24 males, 61 females; age range 51-96 y/o). CARE Item scores showed a statistically significant improvement in self-care (p-value=0.0069) and a nonsignificant improvement in functional mobility (p-value=0.5887) for experimental versus comparison group. Experimental group: 60% of participants satisfied with 1:1 76% satisfied with group session**.**

Conclusion: Replacing one 1:1 treatment session per week with an evidence-based OT group session yielded same or better improvements in self-care performance when compared to those receiving only 1:1 treatment. Group participants reported better satisfaction with group treatment. OTs may use findings to make informed clinical decisions about using groups in SNF settings with patients possessing similar characteristics to participants in this study.

INVESTIGATING PERSONAL STRESSORS OF OCCUPATIONAL THERAPY STUDENTS ON FIELDWORK

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Poster

ABSTRACT:

Occupational therapy students complete two 12-week fieldwork experiences following their didactic coursework. These are full time experiences that prepare the student to become entry-level occupational therapists upon completion. During these clinical experiences, stress can reduce students' effectiveness and productivity (Andonian, 2017; Ariel Chiang et al., 2012; Rezaee et al., 2014). Stressors that can affect students' performance include Covid -19 exposure, maintaining a healthy lifestyle, clinical-life balance, and maintaining a job. However, limited research exists in identifying these stressors and how to accommodate for them during fieldwork experiences. The purpose of this capstone project is to answer the evidence-based question, "What are the internal stressors that Occupational Therapy students experience on their Level IIA Fieldwork?" This project is a single subject design in which quantitative and qualitative date are collected from participants who complete a survey after finishing their first level II fieldwork experience. The participants in the project include individuals who are master's or doctorate level occupational therapy students, enrolled in an accredited program, and completed their Level IIA Fieldwork during the Fall of 2022. The project aims to explore sources of internal stressors that occupational therapy students endure during their fieldwork experience. By surveying the participants, the information gathered will investigate whether the association between internal stressors and completion of their fieldwork experience impact overall professional performance. The significance of this project would result in foundational knowledge and potentially creating resources for students to implement during their fieldwork for an improved overall experience.

IMPROVING SELF-REGULATION IN PRESCHOOLERS USING MINDFULNESS APPROACHES

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Poster

ABSTRACT:

Self-regulation skills serve as reliable predictors of school readiness, peer acceptance, and social and emotional competence (Flook et al., 2015). To enhance self-regulatory skills, one may utilize mindfulness interventions, such as yoga, meditation, journal writing, and kindness curriculums (Sun et al., 2021). These interventions promote self-regulatory skills, including prosocial behavior, executive functions, mindfulness-control, attention, improved social skills, increased emotional well-being, and overall caring for others (Viglas & Perlman, 2017). Even though evidence highlights the importance of self-regulatory skills to determine success in school and life in general, most early childhood education settings do not teach these skills (Flook et al., 2015). The following literature review aims to answer the question: What are the most effective mindfulness interventions used for increasing self-regulatory skills in preschool children three-to-five years of age? Four scholarly databases identified ten relevant articles pertaining to mindfulness interventions, self-regulation skills, and preschoolers to provide the best evidence available. Three themes emerged from the review of the literature: mindful awareness strategies to promote prosocial behavior, yoga interventions to enhance focus and attention in the classroom, and applicable assessments commonly used to measure self-regulation skills. This poster provides evidence-based ideas and explores effective mindfulness interventions such as meditation, journal writing, breathing exercises, yoga, and kindness curriculums. Mindful awareness practices fit appropriately within the OT Framework in categories that pertain to the individual including their performance patterns, and their specific mental functions (AOTA, 2020). Implementing mindfulness-based interventions for preschool-aged children in practice may lead to improving their self-regulation skills. Significant evidence shows the effectiveness of mindfulness-based interventions to improve self-regulation skills in preschool-aged children and implementing a combination of mindful awareness strategies with yoga interventions may ensure that children receive the most effective, evidence-based, and meaningful interventions possible.

Physical and Health Education

CAN WE IMPROVE SOCCER? AN EXAMINATION OF THE STRATEGY OF HEADING THE SOCCER BALL

Tonnie Craft

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Poster

ABSTRACT:

Soccer is the most popular sport in the world with over 256 million players worldwide. Repeat sub-concussive blows to the head from heading the ball have been linked to brain injury; however, there is a lack of data supporting the use of heading from a strategic standpoint. The purpose of this study is to analyze the relationship between heading, touches on the soccer ball, and scoring opportunities. Data was collected by watching soccer match replays from the top professional leagues in the world (English Premier League, German Bundesliga, Spanish LaLiga) and the top professional league in America, Major League Soccer (MLS). Matches were watched independently by two researchers to count headers, touches and scoring opportunities, who reconvened to discuss each match for accuracy. Preliminary data collected from watching five soccer matches (n=10 teams) shows a correlation between the number of touches and scoring opportunities ($R^2 = 0.8094,\ p = 0.002$). Ball possession appears to be higher amongst teams who headed the ball the least (1392 touches ± 241) compared with teams who headed the ball the most (839 touches ± 188); however, more teams may need to be included in this research to show a significant difference. Future research should include more teams to improve the statistical power of this analysis.

THE EFFECTS OF MUSCULAR POWER VS MUSCULAR STRENGTH TRAINING FOR UPPER BODY STRENGTH OF COLLEGE AGED STUDENTS

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Poster

ABSTRACT:

PURPOSE: The purpose of this research was to examine the effects of velocity-based bench press (BP) training compared to traditional high-resistance powerlifting BP training on maximal strength and muscular power developments. Numerous studies examined the relationship between the resistance and the barbell velocity in maximal-effort propulsive BP exercises (e.g., Argus [2014], Bevan [2010], García-Ramos [2016 and 2021]). Loturco (2020) revealed that 80% of the 1RM regular BP can be considered as 100% resistance for the propulsive BP exercise. While competitive powerlifters have incorporated velocity-based propulsive BP with 75-85% of their 1RM into their training programs, no studies investigated the effect of velocity-based training in this resistance range on the actual 1RM performance.

METHODS: A six-week, three workouts per week program was administered. Eighteen college-aged participants were randomized into two groups with different training focuses: muscular strength (MS) or muscular power (MP). MS used 85-100% 1RM resistances and 1-5 repetitions, while MP used 75-85% 1RM for 2-5 repetitions. Pre- and post-tests were conducted on 1RM bench press, four-repetitions dynamic BP for velocity (4RV), four consecutive ballistic push-ups for height (BPU), and incline seated medicine ball toss for distance (MBT).

RESULTS: Within-group comparisons showed that MS improved significantly ($p<0.05$) in 1RM from 201.0±53.8 to 214.5±54.3, and in 4RV from 0.525±0.102 to 0.626±0.108 m/s. No improvements were detected in BPU or MBT for the MS group. MP showed improvement in three test exercises: 1RM from 183.7±79.1 to 196.2±79.2 lbs., 4RV from 0.607±0.119 to 0.673±0.168 m/s, and MBT from 19.12±5.74 to 19.87±5.2 ft.

CONCLUSION: Both groups improved in 1RM and 4RV bench press. Further comparison between the groups revealed that only MP improved in MBT. The principle of specificity seemed to be overwritten by the principle of transfer between maximal strength and muscular power in our study.

Physical Therapy

SRU PHYSICAL THERAPY PLASTIC BOTTLE REDUCTION INITIATIVE

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Poster

ABSTRACT:

Introduction: Humans have developed an intimate relationship with plastics, largely due to the durability and convenience associated with 'disposable' plastic products such as water bottles. Increased consumption of single-use plastics has led to growing environmental and health issues and begs the need for education and intervention to curb this wasteful behavior. **Purpose:** To examine behaviors, attitudes, and knowledge regarding disposable drink-related plastics before and after educational interventions. **Methods:** Students and faculty members of SRU's Doctor of Physical Therapy (DPT) program conducted a six-week plastic bottle reduction initiative during the fall semester of 2022. This initiative was two-fold: (1) distribution of a high-quality, customized drink bottle to each participant; and (2) weekly educational emails on the negative environmental and health impacts of disposable plastics, and ways to reduce these impacts. Initial and concluding surveys gauged participants' perceptions and behaviors regarding water bottles and other disposable plastics. **Results:** Researchers invited 100 students and 20 faculty and staff associated with SRU's DPT program to participate; 94 individuals submitted the initial survey, and 86 completed the concluding survey. A comparison of initial and concluding survey results suggested an overall reduction in disposable plastic drink container usage and increased awareness of environmental sustainability. Overall, single-use bottled water decreased from 18.3% (17 participants) to 5.8% (5 participants) coupled with an increased use of filtered tap water from 49.5% (46 participants) to 65.1% (56 participants). The number of participants who reported, on average, using a disposable plastic drink container >2 times per week decreased from 45.1% (42 participants) to 19.7% (17 participants). A limitation of these findings is the lack of a control group. **Conclusion:** Based on survey data, this small-scale initiative appears to have helped reduce disposable plastic consumption. Researchers gratefully acknowledge grant support from SRU's Green Fund.

PHYSICAL THERAPY STUDENTS TEACH PHYSIOTHERAPISTS IN RWANDA AND GHANA

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Poster

ABSTRACT:

Introduction: Despite the effects of COVID-19 on the healthcare field, two third-year Doctor of Physical Therapy students delivered 12 presentations to physiotherapists in Ghana and Rwanda, Africa. A former SRU physical therapy professor facilitated intercultural communication and relationships through collaboration with individuals in both countries and Health Volunteers Overseas, a non-governmental organization. Students presented lessons to enhance understanding of prevalent patient conditions that present a challenge to physiotherapists every day.

Methods: Participants and instructors in different time zones required the use of an online videoconferencing platform (Zoom) for lectures. Multiple physiotherapists from Ghana and Rwanda attended each weekly seminar. Sessions were recorded for participants unable to attend live sessions. Students requested participants complete a pretest and a posttest for each presentation and actively participate during the discussion sections of the presentations. Participants could ask questions after each presentation and discuss material and resources using a group discussion application ('WhatsApp').

Discussion: We had varying levels of live participation throughout the timeframe of the presentations, and some participants viewed recorded sessions. Participants expressed appreciation for the learning opportunities and international connections. Presenters expanded their teaching skills and abilities to present challenging content. They were also able to review and critique their public speaking skills.

Conclusions: We anticipate that a continuation of presentations and further development of the networking connections will result in an in-person meeting to solidify these intercultural relationships. Further analysis of data will provide more details on the results and implications of this project.

Physician Assistant Studies

SENSORY INTERVENTION TO DECREASE ANXIETY IN ASD CHILDREN

Brandon Hoxworth

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Poster

ABSTRACT:

Slippery Rock University's Physician Assistant program has a special population theme that educates students about the medical needs of special populations, which is a broad term, and includes children diagnosed with autism. Autism spectrum disorder is a neurodevelopmental disorder effecting 1 in 40 children that includes social, communication, and behavioral symptoms (Thom et al., 2020). During Summer 2021, Jennifer Salamon, Director of Communication and Outreach at Autism Connection of Pennsylvania, spoke to our didactic class about taking care of autistic children. Clinicians find themselves struggling with the behavior of autistic children during the visit, minimizing treatment time (Piller & Barimo, 2019). Mrs. Salamon mentioned having sensory items in the medical office and places of admission (ED) to help distract and decrease the agitation an autistic child may experience when out of their normal environment. When an autistic child experiences stimulation overload, like being in a doctor's office, it can cause decreased attention and increase the frustration level of the child (Piller & Barimo, 2019). When an autistic child is admitted to a hospital, there is an abundance of new stimulation that may agitate and distract the child including, loud machines, new smells, wearing a hospital bracelet and hospital gown (Thom et al., 2020). She mentioned items like noise-canceling headphones, weighted blanket, pop-its, and fidget spinners can calm the child and allow the provider to conduct their exam. Autistic children experience their highest level of agitation and distress during medical admission (Thom et al., 2020). It's usually the responsibility of the parent or guardian to calm the child. Medical offices may be unprepared to help with sensory items. Fortunately, with our kits, medical offices can be prepared to help calm the child in the office. We are hopeful that sensory kits will soon become a new standard in all medical offices.

Physics and Engineering

PEERING INTO THE PAST WITH JWST

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Poster

ABSTRACT:

Our universe is enormous, and we are still only beginning to explore it. Despite its vastness, however, we have been able to discover quite a bit with the help of instruments like telescopes, satellites, and, more recently, unmanned spacecraft. One of the newest and most advanced is the James Webb Space Telescope (JWST). JWST is capable of detecting celestial objects entirely in the infrared spectrum. Due to the expansion of the universe, the light from stars and galaxies that formed initially after the Big Bang, have been stretched to longer wavelengths. Operating at the Infrared portion of the Electromagnetic Spectrum it enables JWST to detect objects as far back as 13. 6 billion light years away. In contrast the Hubble Space Telescope can view objects at a distance of approximately 13 billion light years away. In our project, we are studying how the instruments on JWST work and how they can penetrate deep into space through gas clouds to give us a glimpse of the universe when it was very young. The other objective is to examine how JWST will discover and identify nearby objects like Exoplanets and determine their physical properties such as chemical compounds within their atmosphere. JWST will provide answers to how different these first stars or galaxies were compared to the ones we see nearby.

TESTS OF GENERAL RELATIVITY AROUND GALACTIC BLACK HOLE

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Poster

ABSTRACT:

Super massive black holes grow in almost all centers of galaxies. In 2018, astronomers had a unique opportunity to study the effects of the Milky Way's central black hole, known as Sagittarius A (Sgr A*) on the nearby star S0-2 (S2). The observations would allow them to test certain aspects of Einstein's General Relativity (GR). In our project, we are studying the observations that confirmed Einstein's predictions of observed redshift in an orbiting star [S2] at its closest approach to a black hole [Sgr A*]. Continual observation of S2 for nearly two decades confirmed the Schwarzschild Precession of S2, another prediction of general relativity. This is the phenomenon of celestial objects orbiting in a strong gravitational field that changes the location of the closest point to the black hole after every orbit. We are studying the literature on S2 to learn how the perturbation in S2's orbit, and its high velocity at pericenter has expanded our knowledge of the environment close to Sgr A*.

SATELLITE GALAXIES OF THE MILKY WAY

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Poster

ABSTRACT:

The Milky Way Galaxy is a 13.6 Billion years old spiral galaxy. It spans 100,000 light years across while being 1,000 light years thick. The Andromeda Galaxy is the closest neighboring spiral galaxy but there are two satellite structures that are even closer and stand out much more, the Large and Small Magellanic Clouds. The Magellanic Clouds are irregular galaxies. The Milky Way has many satellite galaxies that are gravitationally bound to it. These smaller galaxies are part of what is known as the Milky Way subgroup, which is also part of the larger galaxy cluster known as the Local Group. Most of the satellite galaxies are in the Dwarf Spheroidal class. One of them the Sagittarius Dwarf Spheroidal galaxy will be passing through our Galaxy in 100 million years. The proximity of the satellite galaxy has tidally stripped a stream of stars from the small galaxy and created the Sagittarius Stream that wrap around the Milky Way.

The objective of my research is to study the interaction between the satellite galaxies and the Milky Way Galaxy to understand the evolution of both galaxies. By studying the Sagittarius and Virgo Stream, I want to determine the fate of the satellite galaxies. I am also researching the cause of the Magellanic stream of gas trail that resulted in an interaction of the Small Magellanic Cloud and the Milky Way Galaxy.

DESIGN AN AUDITORIUM ADDITION FOR MACOSKEY CENTER

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Oral

ABSTRACT:

The Macoskey Center for Sustainability Education & Research was founded in the 1990's, the center's goal is to create an environmentally, socially, and economically sustainable and just future through education. However, there is currently only one classroom at the Macoskey Center that holds at most 36 students.

An extension to the current Macoskey house was the proposed solution, the extension would include a large classroom space, two restrooms, and an incorporated sustainable feature. When designing the extension, ADA guidelines were followed. The space will hold 50 students in an auditorium fashion.

The project was conceptualized and made into proposed plans by Autocad. The three options were tweaked per client recommendation until one was chosen. Once the design was finalized Revit and RISA3D were utilized to develop the 3D models.
The structure itself will use materials with low embodied energy, where the energy used throughout the materials life is recorded. The structure will also utilize south facing windows to allow heat to be naturally generated.

In conclusion the extension will increase the number of students that can attend class at the Macoskey Center, while continuing to promote sustainability.

EXPERIMENTAL AIR HEATING SYSTEM FOR INTERNAL CONVECTIVE HEAT TRANSFER RESEARCH

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Poster

ABSTRACT:

Heat transfer from fluid flow through channels, called internal convection, is a widely employed method of heat dissipation in engineering applications, especially in turbomachinery internal cooling. However, internal convection is difficult to characterize as the equipment required to do so is expensive and limits the geometry or material makeup of channels used for study. The purpose of this research is to design and produce a device that will enable research into the characterization of internal convection via a wall calorimeter technique and a FLIR A700 thermal imaging camera. The testing apparatus will be able precisely control and measure the mass flow rate and temperature of air flowing through the device. Knowing the mass flow rate, the air temperature, and outer wall temperature, heat transfer principles will be used to determine the cooling passages effect on internal convection and evaluate the novel geometries effectiveness. This apparatus must also be able to accommodate test sections of various geometries and materials as well as interface with a vacuum tank. The device, once completed, will enable easy testing of novel, internal convection heat exchanger designs including complex geometries created with the university's metal 3D printer. The testing performed with this device can be used to inform the design of novel cooling passages within gas turbines and greater understand the heat transfer capacity of compressible, turbulent flow.

ATOMIC FORCE MICROSCOPE CONTROLLER

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ABSTRACT:

This talk will discuss recent developments in the field of quantum materials and the need for new local imaging techniques to investigate physics at the atomic scale. To make this research accessible to small colleges and high school students, we will design a low-cost, portable atomic force microscope (AFM) suitable for scanning probe techniques on quantum materials and devices. Our prototype uses 3D printed parts and a Raspberry Pi attached to a custom-made printed circuit board for control. The AFM uses PID control systems and voltage to a piezoelectric tube to approach samples with height information from the cantilever. The first application of this microscope will be to image electron flow in two-dimensional materials such as graphene at liquid nitrogen temperatures. Our future plans include condensing the AFM systems into a single FPGA chip and using a homemade cantilever chip to enhance sensitivity, making it more affordable and easier to use.

EXOPLANET DISCOVERY AND CHARACTERIZATION

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Poster

ABSTRACT:

Exoplanets have captivated astronomers, since the discovery of the first one, 51 Pegasi b, in 1995. It was long believed that exoplanets existed, although the optics and techniques to be able to detect them were not good enough until the mid-1990s. Telescopes like Kepler and TESS, have applied multiple methods to discover exoplanets using the radial velocity technique, transits and occultations, microlensing, and direct imaging. With over 4,000 exoplanets being discovered in the past two decades, researchers are beginning to move from detection to focusing on characterization of exoplanets. Characterization of exoplanets includes understanding not just characteristics like orbital period, semi-major axis, eccentricity, and rotational period, but also their geological and atmospheric compositions. This is a relatively new movement, due to the implementation of more complex instruments on JWST allowing for space scientists to gather more information on the physical properties of exoplanets. The main emphasis of this endeavor is to find exoplanets that are habitable, or able to support life as we know it. The purpose of my research is two-fold; first to review the papers published from the Kepler and TESS mission and describe the methods and instruments scientists have used to discover and portray exoplanets. Secondly, I want to examine the data from JWST to understand how scientists are able to detect biosignatures from atmospheres of exoplanets.

CAMPUS EXPANSION PROJECT: NEW ENGINEERING BUILDING

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Oral

ABSTRACT:

Slippery Rock University (SRU) was founded in 1889. At that time, it included just a few buildings. As programs expanded, additional structures were built across the campus. SRU began offering undergraduate degrees in Petroleum and Industrial Engineering in fall of 2016. The program expanded to include Civil and Mechanical Engineering just three years later. As the engineering program continues to expand, there is a significant need to develop an engineering school on campus.

It was a proposed that a new education building was needed to house the engineering classes, laboratories, and administration for the current majors and potential expansion of the engineering program. To create an effective structural plan, the needs of the client were developed into the scope of the project. The scope was then used to create several two-dimensional plans incorporating different layouts of a proposed building. These plans were developed by researching industry codes to determine classroom sizes in relation to students as well as building codes. Architectural designs were transformed from 2D AutoCAD into 3D software, such as RISA and Revit, that were used to create models and calculate structural design loads.

This capstone project developed an engineering school using AutoCAD on SRU main campus. It included 24 administrative offices, 21 classrooms and 16 laboratories that could accommodate up to 1,000 students. Conference rooms, lounge space, and an auditorium space are also included in the design. This new campus building will ensure that all current and future SRU engineering majors have the space needed to succeed.

NITROGEN VACANCY CENTERS IN DIAMONDS TO STUDY THEIR MAGNETIC FIELD EFFECTS

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ABSTRACT:

The setup is based on Nitrogen Vacancy (NV) center in a diamond. The negatively charged state of the NV center in diamond consists of a nitrogen atom replacing the carbon atom next to a vacancy with spin state of 1. When exposed to a 532 nm laser, the luminosity of the NV center is at 637 nm. The intensity depends on the spin state of the NV center before the laser light is shown by using a sequence of laser and microwave pulses and measuring the intensity, a highly sensitive magnetometer probe can be built.

FUTURE OF GRAVITATIONAL WAVE DETECTORS

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Poster

ABSTRACT:

There are many phenomena that both the naked eye and many of the telescopes astronomers have built cannot detect. Sizeable collisions of black holes and neutron stars that occur billions of lightyears away from Earth are impossible to detect naturally, but the gravitational waves that are generated from these large-scale events provide readable information. Almost hundred years after Einstein's prediction of gravitational waves, humans now have the ability to observe and analyze these gravitational waves with detectors such as the Laser Interferometer Gravitational-Wave Observatory (LIGO) and VIRGO. These observatories sense gravitational waves in the 10 to 10^3 Hz frequency range, detecting collisions of neutron stars and black holes with a mass of about 5 to 80 times that of the sun. They however lack the ability to detect lower frequency gravitational waves.

To detect more massive celestial bodies, new detection methods are being developed. The current Pulsar Timing Array (PTA) and the future space-based Laser Interferometer Space Antenna (LISA) would be able to detect gravitational waves with frequencies less than 1 Hz to nanohertz (10^{-9} Hz) range. Objects that produce gravitational waves at this extremely low frequency are Supermassive Black Holes (SMBH) with masses as high as 10^9 times that of our sun. We are researching the literature on PTA and LISA, studying the method of detection of the large gravitational waves, the technical challenges they will face and the discoveries they will make. The continued study of gravitational waves allows us to study the characteristics of the SMBH when they were formed billions of years ago and furthers our understanding of how the universe we inhabit operates.

THE OLDEST MEMBER OF OUR GALAXY

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Poster

ABSTRACT:

Globular clusters are the oldest members of the Milky Way Galaxy. They are comprised of densely packed stars that are gravitationally bound and are distributed spherically around the Galactic center. The largest globular cluster in our Galaxy is Omega Centauri located 16,000 light years away. It hosts nearly ten million stars and can be seen with the unaided eye in the Southern Hemisphere. The purpose of this project is to discuss the importance of globular clusters in understanding the aging process of stars, how they paved the way to helping position our solar system in the Milky Way, to research their formation, and determine if they formed from collision between dwarf galaxies and our Galaxy. By researching papers on these ancient celestial objects, I hope to give insight on the theories behind both globular clusters and our Galaxy formation via the collision of dwarf galaxies.

TELESCOPES OF THE FUTURE

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Poster

ABSTRACT:

This research's purpose is to show the importance and the differences between the ground-based telescopes of the future and the current ones both on Earth and in space. We are reviewing information from journals and different observatories related to these telescopes, focusing on how ground-based telescopes can be built bigger, more easily repairable, and upgradable than telescopes that are in space. The large optical telescopes that will be compared in this study are the Giant Magellan Telescope, the Extremely Large Telescope, and the Vera Rubin Telescope all located in Chile, and the Thirty Meter Telescope in the Northern Hemisphere. We are also researching two radio telescopes the Square Kilometer Array, in S. Africa and Australia, and the Daocheng Solar Radio Telescope in China. Looking at the variety of these telescopes, we can see how Optical and Radio Telescopes differ and what they can reveal about the universe.

GELATION OF IN-SITU GEL IN POROUS MEDIA DURING DUAL-FLUID DUAL-INJECTION PROCESS

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Oral

ABSTRACT:

Hydrogels as plugging agents have been applied in many oil/gas reservoirs to control fluid flow in channels/fractures and divert fluid to target zones/areas. They have been extensively and successfully used in the oil and gas industry to enhance recovery. Hydrogels have superior injectivity and can penetrate deeply in fractures to form sufficient in-depth plugging. However, due to high mobility, gels may flow into both large and small fractures simultaneously if using the traditional single well injection method, which can cause near-wellbore damage. To overcome the near-wellbore damage problem and improve in-depth deliverability, we propose using a dual-fluid dual-well injection method to place in-situ gel into the in-depth.

MACOSKEY CENTER CLASSROOM EXPANSION

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ABSTRACT:

The Macoskey Center for sustainability education and research was established in 1990 on 83-acres of Slippery Rock University in Slippery Rock, Pennsylvania. The primary structure of the Macoskey Center is the Harmony House which was renovated from a farmhouse and has a capacity of approximately thirty students.

The purpose and objective of this project was to design a classroom addition to the Harmony House. Currently, the Harmony House only has one classroom that can hold about 25 students. Space is at premium and the proposed classroom addition will increase student capacity by 60 students.

The design team utilized Revit along with RISA3D create an architectural and structural plan. The client was given three design options to fit a list of needs. Multiple predesign site visits were conducted for surveying the design area and elevation points. Research on materials, building codes, and architecture allowed the design team to collect sufficient data for the design. Meetings were held to ensure that the final product would be suitable for the client.

The final design includes a vaulted ceiling auditorium space that seats up to 60 students. The design also includes lab space, utilities vault, along with space for a geothermal regulator. There will be a living wall and teaching demonstration on the western wall of the addition. The addition will be directly attached to the eastern side of Harmony House and feature large windows giving professors the option to utilize outdoor examples in their lectures without having to endure inclement weather.

In conclusion, the design for a Macoskey Center Expansion will increase the number of classes that can be held at the Macoskey Center. Materials chosen will feature a sustainability aspect and promote green structures.

CHEMICAL FLOODING IN HEAVY OIL RESERVOIRS

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ABSTRACT:

Typically, conventional oil recovery techniques, such as waterflooding and gravity drainage, can only produce up to 35% of original oil in place (OOIP). To further improve the percentage of oil recovered, another technique must be used, which is known as enhanced oil recovery (EOR). One type of enhanced oil recovery is chemical flooding, which can be used to increase water viscosity or alter permeability. Chemical EOR is proposed to be especially useful when dealing with reservoirs that contain highly viscous oil, or heavy oil reservoirs. Since the oil within these reservoirs is so viscous, primary and secondary oil recovery strategies are usually unsuitable for these conditions. Due to chemical flooding being a relatively new method of oil recovery, thorough research must be conducted on both lab studies and field data. This research will be used to determine if chemical enhanced oil recovery is in fact beneficial when dealing with heavy oil reservoirs.

MACOSKEY CENTER PARKING LOTS DESIGN

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ABSTRACT:

In 1990, the Macoskey Center at Slippery Rock University was founded with the vision of creating an environmentally, socially, and economically sustainable future. For many years, the Macoskey Center has struggled with existing parking lots which are currently constructed of gravel and have limited parking spaces. The parking lots require constant maintenance which is caused by daily traffic and stormwater erosion. The objective of this project was to design a parking lot at the facility and a parking lot (Lot E) directly across Harmony Road from the Macoskey Center. The Macoskey Center is a known resource for sustainability education and demonstration. Therefore, the goal of this project was to design a sustainable, safe, and environmentally friendly parking lot that also increased the capacity of the center. Based on the clients' needs, the design for buses, heavy equipment, ADA accessibility, as well as providing enough spaces for large events, such as Earth Fest, were considered. Additionally, a crosswalk was designed to ensure pedestrians can cross Harmony Road safely. The design team considered different approaches to address these issues: each space was surveyed, multiple pavement materials were researched, and three designs were created to meet current needs, as well as anticipate future needs of the facility.

As a result, the pavement design and detailed plans were completed using a sustainable pavement material called TrueGrid. This material is made of 100% recycled high-density polyethylene and will have enough structure to support all the loads placed on each parking lot. In, addition this pavement material features a 100% infiltration rate, effectively reducing all stormwater runoff, and eliminating pollution into the environment. In conclusion, after proposing three designs for each parking lot, a design was chosen that provided the client with a safe, reliable, compliant, and sustainable product that will last for years to come.

SYNTHESIS AND STRUCTURAL CHARACTERIZATION OF MOLYBDENUM CARBONITRIDE NANOPLATES

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ABSTRACT:

Molybdenum carbide (MoC/Mo_2C) in bulk is chemically stable, corrosion resistant, metallic, and superconducting. Due to the advance in the nanotechnology field and synthesis procedures, single crystal Mo_2C in a nanoplate morphology has been fabricated and retains the properties of bulk down to a few nanometers in thickness. Further tuning the electronic properties of this nanomaterial could potentially be achieved by alloying with nitrogen through ammonolysis. Nonetheless, to confirm the alloy transformation, a careful structural characterization tied to the ammonolysis treatment must be undertaken to obtain single crystalline molybdenum carbonitride (MoCN). A two-step procedure was implemented: Mo_2C was synthesized through chemical vapor deposition (CVD) then converted from single crystal Mo_2C to MoCN by ammonolysis. Ammonolysis temperature and time were varied to study the conversion process. Optical microscopy and scanning electron microscopy (SEM) were used to analyze the morphology of the nanoplates. Transmission electron microscopy (TEM) and X-ray diffraction (XRD) were used to evaluate the crystallinity of the obtained material. We established that high temperatures and longer durations cause rapid diffusion of nitrogen, leading to a polycrystalline structure. Future work includes further optimizing the parameters of the ammonolysis treatment and characterizing the electronic and superconductive properties of single crystal MoCN.

Psychology

PROBLEMATIC DRUG USE IN THE LGBTQ+ COMMUNITY

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ABSTRACT:

The LGBTQ+ community often experiences discrimination and judgement from society, suggesting that LGBTQ+ individuals may be at increased risk for problematic drug use. This project examined whether there is an association between sexual orientation and problematic drug use through a secondary analysis of deidentified data from Wave IV of The National Longitudinal Study of Adolescent to Adult Health (Add Health). The sample included 5085 adults (20 to 32 years) grouped according to their sexual orientation (100% heterosexual; mostly heterosexual; bisexual; mostly homosexual; 100% homosexual; asexual). Problematic drug use was measured with 7 questions about use of a favorite drug. An Analysis of Variance (ANOVA) revealed a significant difference in the amount of problematic drug use among the six sexual orientations, F (5,5080) = 20, p <.001. Participants who identified as 100% heterosexual (M = .292, SD = 1.15) reported significantly less problematic drug use than participants who identified as mostly heterosexual (M = .84, SD = 1.84), p < 05. However, there were no significant differences between the 100% heterosexual group and asexual participants (M = 0, SD = 0), mostly homosexual participants (M = *.225, SD = .91*), bisexual participants (M = .63, SD = 1.58), or 100% homosexual participants (M = .72, SD = 1.73). The results show that young adults who identified as “mostly heterosexual” reported higher rates of drug use than those who identified as 100% heterosexual, but other groups within the LGBTQ+ community did not differ from heterosexual adults. Future research should focus on characteristics of young adults who identify as “mostly heterosexual” that may underlie this finding with a goal of promoting healthy and positive development among all groups in the LGBTQ+ community.

PSYCHOSOCIAL EFFECTS OF INTERSEX CONDITIONS

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ABSTRACT:

Intersex individuals are those with genetic differences in sexual development resulting in chromosomal or hormonal differences. Of the vast number of possible differences in sexual development, those prioritized in this paper are congenital adrenal hyperplasia, androgen insensitivity syndrome, and 5AR deficiency. Androgen insensitivity syndrome (AIS) results when an XY individual has either an inactivated or partially inactivated SRY gene, this results in the insensitivity to androgens that assist in typical male sexual development, thus these individuals present either female or androgynously (Krupp et al., 2014). Congenital adrenal hyperplasia occurs with overactive adrenal glands producing excess hormones resulting in differing sexual characteristics (Kerry, 2011). 5AR deficiency is a deficiency of 5 alpha reductase that fails to convert androgens, thus resulting again in ambiguous sexual presentation (Pritsini et al., 2017). These individuals, despite not being predisposed to mental illness due to the nature of these biological or hormonal differences, experience significantly higher rates of mental illness and suicide (Rosenwohl-Mack et al., 2020; Wisniewski & Mazur, 2009). This is found to be the result of social isolation, familial rejection, and discrimination in both medicine and social standing. The proposed poster will discuss three types of intersex conditions and the biopsychosocial consequences of each. This project fulfills honor's program credit for Developmental Psychology.

THE EFFECT OF CAFFEINE ON TERRESTRIAL HERMIT CRABS

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ABSTRACT:

Research shows that human pharmaceuticals have negative implications on aquatic organisms, ranging from growth inhibition to mortality (Blaise et al., 2006). The purpose of this study was to determine the effects of caffeine on *Coenobita clypeatus* (terrestrial hermit crabs). Caffeine has been shown to increase behavioral movement (Ball & Poplawsky, 2011). The hypothesis was that caffeine would increase hermit crab activity. Hermit crab activity was defined as movement of antennae, walking around aquariums, and pinching of claws. Two hermit crabs were removed from their habitat and placed in a plastic traditional sized rodent cage. Hermit crabs were acclimated to the environment for 30 minutes prior to being soaked in a caffeine solution or plain water, respectively. There was 501mg/L of caffeine in the experimental solution. Hermit crab activity was subjectively measured through magnitude of antenna movement, duration of movement, and pinching of claws. The results show that administration of caffeine was correlated with increased activity in the hermit crab. The hermit crab who was soaked in the caffeine solution showed greater antennae movement, greater claw movement, and longer overall duration of movement. The results are consistent with the observed effects of caffeine on other organisms (Ball & Poplawsky, 2011). These results indicate that the behavioral effects of caffeine are conserved across species.

HABITUATION TO AUDITORY AND PHYSICAL STIMULI IN HERMIT CRABS

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Poster

ABSTRACT:

Previous research has shown that crustaceans are able to habituate to physical and auditory stimuli and diminish the initial "fear-reflex" that occurs when being presented to new stimuli (Fink, 1941). Habituation is the process in which a stimulus is presented consistently in order to decrease a fear reflex or an emotional, instinctual reaction to the stimulus. Data have shown that hermit crabs can become habituated to auditory white noise if it is presented consistently (Stahlman et al, 2011). These articles show that hermit crabs have a natural tendency to withdraw into their shells after being presented with new auditory or physical stimuli that may be considered threatening. The current study will examine if habituation can occur in hermit crabs that are consistently presented with a buzzer that produces a physical vibration and auditory sound. The research shows that the learning process of habituation can occur even among lower order species and can transfer to higher order species as well. Our hypothesis is that the hermit crab will become habituated to the buzzer vibration and sound after repeatedly being exposed to it.

PERCEPTIONS OF BELONGING AMONG MINORITY COLLEGE STUDENTS

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ABSTRACT:

Lack of minority representation on college campuses is associated with lower grades, low psychological well-being, and lower feelings of safety (Weiher, 2000; Byrd & McKinney, 2012; Ben-Ari & Gil, 2004). The aim of the present study is to examine the effects that student organization membership may have on the psychological well-being and feelings of belonging of minority students on campus. It is hypothesized that minority groups with more representation on campus will report higher feelings of psychological well-being and belonging. Membership in a minority student organization is predicted to be a significant factor related to belongingness and well-being. Data (N = ~100) will be collected via the Qualtrics online platform from students who are members and non-members of minority student organizations at Slippery Rock University during the Spring 2023 semester. The participants will complete a demographics form, General Well Being Schedule (Dupuy, 1977) and The College Student Experience Questionnaire (Pace & Kuh, 1998) to measure students' subjective well-being and sense of belonging. Data will be analyzed using correlational and regression analyses. ANOVA analysis of subjective well-being and sense of belonging between members of minority student organizations and non-members will be analyzed. The results of this study may provide insight as to what groups are being represented well in which minoritized students feel a sense of belonging, and which one may need representation or improve on their visibility and/or access. These findings could aid future decisions to diversity, equity, and inclusion initiatives, and improve student quality of life, which could lead to increased student retention rates. The data will be collected, analyzed, and ready for presentation in time for the SRU Symposium.

CREATING DEVELOPMENTAL PSYCHOLOGY LAB ASSIGNMENTS USING ARCHIVED RESEARCH VIDEOS FROM DATABRARY.ORG

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Oral

ABSTRACT:

Opportunities to engage in research greatly enhance student learning in psychology classes. Although direct engagement with research participants is one type of valuable experience, students can learn research skills and greater understanding of research methods using archived research videos when direct interaction is not possible. One situation in which access is often not available is research with infants and young children. This project involves reviewing archived videos from Databrary.org to develop lab activities and a lab manual for developmental psychology courses. We plan to develop 3-5 lab activities, centered around physical, cognitive and socioemotional milestones in infancy and early childhood, by the end of the semester. These will include activities related to different developmental achievements of infants and children and involving different research designs.

Databrary includes video segments associated with over eight-hundred research studies. The studies address a wide variety of research questions related to physical, cognitive and socioemotional development from infancy through middle childhood. In this talk, we will describe our work developing two labs: 1) Strange Situation: This lab introduces students to the classic research paradigm, the Strange Situation, which measures attachment security in infancy. This lab will help students to understand the difference between naturalistic and structured observation and provide experience coding behavior. 2) Self Concept: This lab introduces students to recent research on the effect of language on self-concept and behavior in early childhood. Students will gain skill in identifying independent and dependent variables in structured observations. Descriptions of the labs will include learning objectives, the video to be used and activities included in the lab. Discussion will include the challenges encountered in developing the labs and reflection on what we learned about children's development and research methods in the field of developmental psychology.

ETHANOL INDUCED CONDITIONED PLACE AVERSION IN FEMALE JAPANESE QUAIL

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ABSTRACT:

Addiction is a deadly epidemic that takes nearly 88,000 lives a year, with less than seven percent of people struggling seeking treatment (Caron Treatment Centers, 2019). Previous literature primarily focuses on physical positioning cues in rodents (Bardo et al., 1995), while the current research focuses on discrete visual cues in female Japanese quail. Additionally, there is limited research with female quail using the conditioned place preference (CPP) method (e.g., Gill et al., 2016). The present study aims to use female avian subjects to measure preference of a discrete visual cue paired with ethanol. 19 quail received a drug (ethanol) or placebo (water), alternating for 8 days. Drug and placebo were administered via gavage at 0.75 g/kg per quail. Following the experiment, birds were given free access to either chamber. Preference was measured by beak to discrete visual cue (light) orientation. The current results show that there was not a significant difference between the control and experiment groups' time spent near the alcohol paired light, $F(2,18) = 1.539$, $p = .245$. However, this may be due to a small sample size. Investigating the behavior of the treatment group in the post-test shows a possible aversion to ethanol. Birds given ethanol spent less time after conditioning (post-test) with the ethanol light ($M = 10.04$, SEM=2.01) compared to the pre-test time spent with the ethanol light ($M = 47.41$. SEM=20.09).

This study is a first step in developing a visual model of discrete cue CPP using female quail. This has the potential to aid in future pharmacological and psychological treatments for those who suffer from alcohol use disorders and specifically may be affected by visual cues.

EXPLORING SELF-COMPASSION & BODY IMAGE IN NON-BINARY & GENDERQUEER INDIVIDUALS

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ABSTRACT:

Introduction: Gender diversity adds complexity to body image as Western culture continues to reinforce cisgender and gender-conforming beauty standards. There is currently limited research that analyzes the levels of self-compassion as a potential protective factor against negative body image in NGBQ individuals as well as transgender binary individuals. The objective of this study is to examine the effects of perceived sociocultural pressures and gender identity and expression on body shame and to explore how self-compassion may moderate the effects of perceived sociocultural pressures to have a thin body.

Methods: Participants (*N*=223) consisted of 50 cisgender women, 50 cisgender men, 28 transgender men, 17 transgender women, and 78 nonbinary individuals were 18-78 years old (*M* = 30 years, *SD* = 10.9 years) undergraduate college students and members of the community who completed a survey as part of a larger study. Community members were recruited from Akron Pride festival and the crowdsourcing website, Prolific.

Results: Preliminary data analysis found that nonbinary individuals experience higher levels of perceived sociocultural pressures (*M* = 2.23, *SD* = .88) compared to transgender men (*M* =1.68, *SD* = .73), transgender women (*M*= 1.75, *SD*= .97), cisgender men (*M*= 1.84, *SD*= .80), and cisgender women (*M*= 2.07, *SD*=.79), but were not statistically significant *p*= .006. Cisgender women had the highest body shame levels (*M*=3.85, *SD*= 1.28) and transgender men had the lowest body shame levels (*M*=2.66, *SD*= .97). Nonbinary individuals had the lowest levels of self-compassion (*M*=2.94, *SD*= .78), *p*= <.001.

Discussion: NBGQ individuals experience higher perceived sociocultural pressures and lower self-compassion than binary transgender or cisgender individuals. Further data analysis will explore the role of self-compassion as a moderator of perceived sociocultural pressures and higher levels of body shame.

BODY IMAGE COMPARISONS OF NONBINARY AND CISGENDER MEN AND WOMEN

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Poster

ABSTRACT:

Research of LGBTQ+ individuals started with the study of gay men and has evolved into studies of all who fall under the LGBTQ+ umbrella. Non-binary individuals are those who are considered to fall outside or in-between the binary (i.e., male or female; Abrams & Ferguson, 2022). However, with this comes the struggle of dealing with genderism, body image issues, and the longing to be who they are without judgement. The purpose of the present study is to examine the relationships between cisgender and non-binary individuals regarding others perception of their gender role appearance and behaviors, body shame and surveillance, and what they would change about their bodies if they could. The data is from an existing data set from the PRIDE II study and will include a subset of the full data set. Participants will be 50 cisgender men, 50 cisgender women, and 47 nonbinary individuals. The measures included a demographic questionnaire, the shame and surveillance subscales of the Objectified Body Consciousness Scale (McKinley & Hyde, 1996), an appearance scale (Keener et al., unpublished), and the Gender Expression Scale (Austin et al., 2010). It is predicted that non-binary individuals will perceive others as categorizing them as more androgynous in their gender roles as compared to cisgendered individuals. Nonbinary participants also will want to change their appearance in their chest, genitals, and facial features than their cisgendered counterparts. Lastly, it is predicted that nonbinary participants will report more body shame and surveillance than cisgendered males and females. Correlations and ANOVAs will be used to analyze the predicted outcomes. The implication of the project is to provide more understanding of the nonbinary population which may lead to the development of gender identity affirming intervention programs. The data and poster will be completed for presentation at the symposium.

Safety Management

EVALUATION OF NOISE EXPOSURE AT INDOOR SPORTING EVENTS

Hannah Roberts, Andrew Lukitsch, Ashley Collura, Jacob Brand, Sophia Naugle, Antonio Mitchell, Ashton Goodin, Brody Powell, Devin Sims, Ethan Presloid, Jennie Stiefel, Micaela Golub, Nathan Belack, Sean Northcott and Thomas Koraido

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ABSTRACT:

Loud noise is a hazard in the workplace. The Occupational Safety and Health Administration (OSHA) action level for noise is 85 decibels and the OSHA Permissible Exposure Limit (PEL) for noise is 90 decibels for an 8-hour Time Weighted Average (TWA) (Hearing Conservation, 2023). When exposed to noise levels at the action level, employers are required to conduct annual hearing tests. Noise exposures greater than 90dBA are associated with hearing loss. This research project investigated the noise levels at indoor sporting events. The researchers used NoiseCHEK SKC personal noise dosimeters to record noise levels at six basketball games at SRU (three men's and three women's basketball games). Researchers sat in the same locations for each game and the noise levels were recorded and compared. The data indicated that the men's games had a higher noise level than the women's games, and that all games were below the PEL set by the Occupational Safety and Health Administration. After evaluating the data, the researchers concluded that the exposure to these levels of noise at this duration, and at this venue are not likely to cause hearing loss. Although the results for this project showed the noise levels were below the action level and PEL, it is prudent for avid attendees of indoor sporting events to be mindful of the potential exposure.

Strategic Communication & Media

GOOD OR BAD FOR YOU? A SECONDARY RESEARCH ANALYSIS OF THE MENTAL HEALTH EFFECTS OF SOCIAL MEDIA USE

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ABSTRACT:

Research regarding the mental health effects of social media use is mixed. On one hand, research indicates that social and digital technologies have profound and positive effects on emotion regulation processes, thereby impacting a host of mental health variables (e.g., Akram et al., 2020; Wadley et al., 2020). On the other hand, research also suggests that social media platforms have negative effects on mental health variables including self-esteem (e.g., Steinsbekk et al., 2021) And depression (e.g., Barry et al., 2017).

While there is a breadth of research on the topic of social media and mental health, these inconsistent results generate many questions regarding the effects of social media use on mental health. The current study presents results of a secondary research study in which a host of self-related variables, and their relationships with social media use and mental health are discussed. Specifically discussed are: how active and passive social media use, social comparison, personality variables may impact the social media-mental health relationship.

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