2025 University Research Symposium

Illinois State University

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ILLINOIS STATE UNIVERSITY
Illinois' first public university

Welcome to the 2025 University Research Symposium!

The University Research Symposium is ISU's premier showcase for student scholarship. This year's symposium features more than 346 individual, group, oral or poster presentations, an e-poster session for students unable to present on campus, with 77 participants, satellite events for disciplines that push the boundary of the traditional poster presentations, and a showcase of the 2025 Image of Research Competition winners.

Research is integral to ISU's commitment to excellence in teaching, learning, and scholarship. Research ignites curiosity, enriches educational experiences, and supports the creation of new knowledge. For us, research encompasses diverse forms of inquiry, scholarship, and innovation that aim to make an intellectual or creative contribution to a field. We welcome all students to participate in our community of scholars, and are excited in the variety of ways they contribute —such as through course-based projects, independent studies, summer research experiences, as well as through thesis and dissertation projects. Our offices and campus partners are proud to support student research with grants and travel funds, workshops, technical resources, research competitions, and exhibitions. We encourage and enable students to take part in off-campus professional and academic conferences at the regional, national, and international level.

Student research would not be possible without dedicated faculty and staff mentorship. Our teacher-scholars provide subject matter expertise, skill building, and career guidance. They work with students as research partners by co-authoring publications, conference papers, and creative works. They help students grow as professionals, preparing them for future careers in academia, industry, or other fields.

Research encourages interdisciplinary collaboration both within the university and with external partners. This collaboration broadens students' and faculty's perspectives, exposes them to different approaches and creates a stimulating intellectual environment that further enhances teaching and learning. As part of our Symposium, we highlight some of ISU's interdisciplinary centers and other faculty-led projects, including projects with partner organizations and the Advancing Research and Creative Scholarship (ARCS) projects, which are collaborative teams with internal and external stakeholders across disciplines.

Today we celebrate the many forms of research at Illinois State. Congratulations to our student and faculty scholars!

Dr. Craig C. McLauchlan, AVP for Research and Graduate Studies
Dr. Gina Hunter, Director, Office of Student Research
Dr. S. Gavin Weiser, Interim Director, Graduate School

Morning Session Abstracts

AGRICULTURE

THE JOURNEY OF CORN

Presenter(s): Cortina Zanella, Marina, Undergraduate, Agriculture

Mentor: Dr. Iuliia Tetteh

Authorship: Marina Cortina Zanella, Dr. Iuliia Tetteh

Corn is one of the most important crops in the world, playing a crucial role in agriculture, economy, food security and the environment. It is present in everything, varying from livestock feed to syrup, starch and ethanol on all the continents of the world. A little grain that originated in Mesoamerica and domesticated over 9,000 years ago is now a vital component of global food systems, economies, and ecosystems. This study explores the journey of corn, tracing its transformation from seed in the soil to its various end uses in the supply chain highlighting the essential contributions of corn to agriculture, food security, and the global economy. We examine the crop's role in diverse industries, from local ethanol plant near farms in Gibson City to its far-reaching applications in international markets, such as animal feed in China or Mexico. The data for this project was collected through in-person visits with industry experts throughout the corn supply chain and secondary data sources (e.g., USDA ERS, USDA FAS).

IMPACT OF SELECTED COVER CROPS ON SOIL POREWATER N AND P CONTENT

Presenter(s): Hasan, Md. Mahadi, Graduate, Agriculture

Mentor: Dr. Rob Rhykerd

Co-Mentor: Dr. Nicholas Heller

Adoption of winter cover crops in the U.S. Midwest may reduce N and P leaching from the soil, which could reduce the hypoxic zone by reducing N and P entering the Gulf of Mexico. To evaluate the impact of selected winter cover crops, a field study was conducted at the Illinois State University (ISU) Research Farm and the Western Illinois Research Farm. The experimental design was a block experiment with four replications. Cover crop treatments included a winter fallow, wild pennycress (WPC), golden pennycress (GPC), cereal rye (CR), annual ryegrass (AR), and a mix of peas, clover, radish, and oats (PCRO). Soil porewater was collected with lysimeters fitted with a porous ceramic cup at 45 and 90 cm soil depths. Nitrate-nitrogen, ammonia, and dissolved reactive phosphorus (DRP) were analyzed using EPA-certified methods and a Lachat© (Milwaukee, WI) flow injection analysis system. Results from the ISU farm showed a significant reduction in soil porewater nitrate from the WPC, GPC, CR, and AR treatments. Results from WIU showed a significant decrease in soil porewater nitrate from the CR at the 45 cm depth. Soil porewater ammonia was significantly reduced under all cover crop treatments at ISU and only from the AR and CR from the WIU plots. All cover crop treatments reduced DRP in soil porewater at ISU, except for the 45 cm depth from the PCRO mix. Results from WIU showed AR and CR reduced DRP. Winter cover crops show potential to reduce soil porewater N and P, which could help reduce the loss of fertilizer fromagricultural fields and may contribute to reducing the size of the hypoxic zone in the Gulf of Mexico.

EFFORTS TO PROTECT THE GREAT LAKES ECOSYSTEM FROM ASIAN CARP MIGRATION

Presenter(s): Kies, Clay, Undergraduate, Agriculture

Mentor: Maria Boerngen

Asian carp are a threat to the Great Lakes ecosystem that could seriously endanger the food chain, the economy, and recreational activities. At stake is the $7 billion Great Lakes fishing industry. Four species of Asian carp, originating from Asia, were introduced in the United States during the 1970s to control weeds in canal systems plus algae in aquaculture farms. Unfortunately, the Asian carp escaped into the Mississippi River Basin with waterways reaching into 31 states and started to migrate north toward the Great Lakes. In June 2022, the Illinois Department of Natural Resources rebranded the Asian carp as “Copi”. The rebranding was to make the fish more attractive for consumers to eat with an estimated 20-50 million pounds being caught annually in the Illinois River.

Asian carp can rapidly reproduce with females producing millions of eggs each year that would overwhelm other species and outcompete native fish for food. The silver carp pose a danger to boaters and water sport folks as they leap out of the water from being startled from the sound of a motor. Over the past five decades, efforts to prevent the carp from entering the Great Lakes have involved monitoring, barriers, and various control projects. The government has spent over $300 million since 2009 to address the threat of Copi entering the Great Lakes. An additional $15 million was allocated in 2021 to support research, monitoring, and physical barriers such as electric fish barriers in waterways like the Chicago Sanitary and Ship Canal. Numerous state and federal agencies collaborate through the Asian Carp Regional Coordinating Committee, which also includes the Canadian government and non- governmental organizations. Through interviews with stakeholders such as the U.S. Army Corps of Engineers and environmental groups, we will identify the current status of the migration and various mitigation projects.

FARM MANAGEMENT SHAPING ILLINOIS AGRICULTURE

Presenter(s): Koeller, Hattie, Undergraduate, Agriculture
Grant, Connor, Undergraduate, Agriculture
Malone, Molly, Undergraduate, Agriculture
Rappe. Cole, Undergraduate, Agriculture
Robson, Ethan, Undergraduate, Agriculture
Wier, Zander, Undergraduate, Agriculture
Winnans, Toby, Undergraduate, Agriculture

Mentor: Dr. Maria Boerngen

In the state of Illinois, over 50% of the acres are not farmed by the owner; this creates a vital need for good farm management practices. Farm management is a sector of the agriculture industry that bridges the gap between landowners and farmland operators to produce a successful crop. Within our research, we will interview farm managers from Illinois to cover some special problems within agriculture. A specific obstacle we see in the industry is land in Illinois being heavily rented. This places a challenge in communication as many landowners are distant from the farm. Our findings will include farm managers' perspectives on topics such as credibility in the industry, making large business decisions, and challenges they face within agriculture.

BARRIERS TO ACTIVE STUDENT PARTICIPATION IN AGRICULTURE REGISTERED STUDENT ORGANIZATIONS

Presenter(s): McNalis, Maggie, Undergraduate, Agriculture

Mentor: Dr. Jay Solomonson

Co-Mentors: Dr. Michael Barrowclough and Dr. Lucas Maxwell

Authorship: Maggie McNalis, Jay Solomonson, Michael Barrowclough, Lucas Max

Research has shown that active student participation in university registered student organizations (RSOs) has been positively correlated to student academic performance. Students who actively engage in RSOs tend to have higher GPAs, are more likely to have a job offer at graduation, and are more satisfied with their overall collegiate experience. While the benefits of participation in such organizations are numerous, recent research found nearly one-third of students spend no time on extracurriculars weekly. The purpose of our study was to identify current barriers to active participation in department of agriculture RSOs at Illinois State University (ISU). The objectives of our study were to (1) Determine the time ISU agriculture students spend weekly on extracurriculars,(2) Determine student satisfaction levels with campus life beyond the classroom, (3) Identify barriers to participation in RSOs, and (4) Identify factors that may increase participation in RSO activities. Using a census design, we administered an electronic questionnaire to collect data via Qualtrics during the spring 2024 semester to all 362 undergraduate agriculture students. Our efforts yielded a response rate of 22.9% (n = 83). The descriptive data were analyzed using SPSS v.24. Our findings show that an equal number of agriculture students (48.2%) spend zero hours per week and one to five hours per week on activities of their RSOs, while only 3.6% spend more than six hours a week on their extracurriculars. Slightly over half (51.7%) felt satisfied with their overall involvement in campus life beyond the classroom, while only 39.8% felt satisfied with their agriculture RSO involvement. Most students indicated they were neither satisfied nor dissatisfied with their extracurricular involvement. The leading barriers to participation in RSOs included (1) timing or location of events, (2) off campus work, (3) lack of knowledge about activities, (4) not living near campus, and (5) feelings like they do not belong. Respondents indicated that the top factors that could increase their participation would be (1) having meetings time that fit better with their schedules, (2) better advertising of the RSO, (3) less academic work, (4) having a friend in the RSO, and (5) being more aware of the time commitment to participate. The ISU Agriculture Department has a lot to offer students with their RSOs. It is recommended that student leadership in these agriculture RSOs review these findings and make modifications to their schedules and recruitment efforts to yield a higher participation rate for potential members.

THE ROLE OF KEY CHARACTERISTICS IN SPORT HORSES AS VALUED BY BUYERS

Presenter(s): Stiverson, Whitney, Undergraduate, Agriculture

Mentor: Dr. Michelle Kibler

Authorship: Whitney Stiverson, Michelle Kibler, Jennie Ivey, Jada Thompson

The sport horse industry continues to be popular as people compete at various levels in horse sport. To bridge the gap between breeders, sellers, and buyers, relevant buyer preference data must be available. Previous studies have found heterogeneity among buyer preferences for horse attributes of non-racing thoroughbreds and stock-type horses. To understand buyer valuation of sport horse attributes, auction data collected including physical horse attributes, seller information about the horse, and auction information for 3,353 horses listed at online sport horse auctions from 2013-2024. Horses younger than one year old and were excluded from the analysis considering they are purchased on expectations rather than current ability. An ordinary least squares regression was modelled to determine factors contributing to a horse's value, comparing bid price to auction, horse, and geo-temporal factors for 2,382 horses that were older than a year old sold at online auctions from 2013-2024. Summary statistics and hedonic models were estimated in Stata 18 (StataCorp 2023). Robust standard errors were used to adjust for heteroskedasticity in the data. Geldings held the highest premium, with mares discounted $1,789 ($p<0.001$). Chestnut horses had a $738 ($p<0.05$) discount compared to bay/ brown. In comparison to quarter horses, warmblood breeds such as Oldenburg or Dutch Warmblood commanded a premium, $4,007 ($p<0.01$) and $4,169 ($p<0.01$) respectively. In contrast, sport horse buyers discounted Thoroughbred horses in comparison to quarter horses ($2,709; $p<0.01$). A horse's current or prospective training and sport listed did have an impact on price, where horses listed with hunter under saddle training were valued $922 more ($p<0.01$) on average than horses without training listed. In contrast, a horse listed with trail training were valued $1,001 less ($p<0.01$) than those not listed as trail. Determinants vary based on discipline and buyer preference, but overall, breed, color, discipline, and sex preferences impact the selling price, and thus provide a better understanding for seller and buyers in these auctions to more accurately set price expectations.

References

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IMPACT OF WINTER COVER CROPS ON CORN YIELD AND SEED QUALITY

Presenter(s): Stockmaster, Ashley, Graduate, Agriculture

Mentor: Dr. Rob Rhykerd

Co-Mentor: Dr. Nicholas Heller

Winter cover crops are being used in the Midwest to reduce nutrient runoff from agricultural fields and show potential to mitigate climate change. However, some have expressed concern that cover crops may reduce summer cash crop yields. This study evaluates the impact of selected cover crops on corn yield and quality. A field study was conducted at the Western Illinois University Research Farm in Macomb, Illinois and Illinois State University Research Farm in Lexington, Illinois. The experimental design was a block design replicated four times at both sites. Winter cover crop treatments consisted of a pea-clover-radish-oat mix, wild pennycress, golden pennycress, cereal rye, annual rye, and a fallow (reference) plot. Corn was the summer cash crop planted in May 2024. After the corn grew throughout the summer and reached maturity, it was harvested in September (WIU) and October (ISU) 2024. To evaluate corn seed quality, ears of corn were harvested by hand from a ten-foot strip of the two center rows of the plots. The number of plants that ears were harvested from in each plot were then counted to determine plant population. To determine yield, corn kernels were removed from the cobs by hand from the ISU samples after the ears had been oven dried. Because WIU samples were harvested for silage rather than grain corn an Excel model was used to estimate WIU yield based on the number of plants collected from that site and yield data from the ISU site. Corn seed samples were then analyzed for indicators of seed quality using a Near Infrared (NIR) Spectrometer. The NIR measured protein, oil, and starch. Results showed that some of the cover crops negatively impacted yield, protein, oil and starch while plant population was not affected. Longer term studies are needed to better show the impact of cover crops on summer cash crop yield and quality.

FEMALE POETS OF THE MODERNIST ERA

Presenter(s): Fox, Cylas, Undergraduate, Art

Mentor: Dr. Melissa Johnson

The modernist era was a time of pushing boundaries and rules when it came to art and creation, this followed into the world of poetry. I set about making a collection of poems written by women during the Modernist era, specifically about the disdain for the role they were seeing women forced to play within society, or that they themselves were forced into. I also created a chapbook with this collection of poems, designing the pages based on a tattoo design style known as “Trash Polka” to go with the “grunge” aesthetic that the poems all seem to invoke with their imagery and their tones. Poets included are Mina Loy, Georgia Douglas Johnson, Alice Moore Dunbar-Nelson, Amy Lowell, Gwendolyn Brooks, Celine Arnauld, Baroness Elsa von Freytag-Loringhoven, and Florine Stetheimer.

THE UNDOMESTICATED SPACE

Presenter(s): Tomlinson, Abigail, Undergraduate, Art

Mentor: Dr. Melissa Johnson

The domestic space is a space that has historically been depicted in art and can create a pleasant visual documentation of what life looks like. Rather than looking into the domestic space and its connections to dada, this research aims to explore the undomesticated interior and how it is defined in art. Looking at works by artists such as Kurt Schwitters, Judy Chicago, Liza Lou, Martha Rosler, and Do Ho Suh. Due to the inspiration of this project coming from Kurt Schwitters and his Merzbau, the first section of this paper is dedicated to the history and significance of the Merzbau and the piece as an undomesticated interior. The second section discusses the undomestic and gendered spaces. I was interested in both the difference in subject matter in undomesticated spaces when created in femininity versus masculinity and in subject matter. The final section of this investigation creates a connection between dada and the undomesticated space. I was asking questions like “What is the undomesticated space?”, “How does the domestic interior act differently than an undomesticated interior?”, “How does the undomesticated space act when created by men versus women?”, and “How does dada connect to the undomesticated space?"

ARABIDOPSIS CELL SHAPE REGULATION: INSIGHTS INTO THE FUNCTIONS OF TRM18 AND TRM33 PROTEINS

Presenter: Abdullah, Abu Habib Md, Graduate, Biological Sciences

Mentor: Dr. Viktor Kirik

Authorship: Abu Habib Md Abdullah, Madison Durbin, Viktor Kirik

Despite lacking centrally organized Microtubule Organizing Centers (MTOCs), plant cells organize microtubules in ordered arrays essential for division, expansion, and shape acquisition. TONNEAU1 (TON1) proteins in plants share homology with the human centrosomal protein Fibroblast growth factor receptor 1 Oncogene Partner (FOP). Both proteins are shown to be involved in the organization of microtubule arrays. The molecular function of the TON1A protein remains elucidated. It was shown to interact with a family of TRM (TONNEAU1-like Recruiter Motif) proteins that include 34 members. Our goal is to reveal the functions of the TRM proteins in the cytoskeletal array organization, cell shape, and cell division. We have found that overexpression of TRM18 with GL2 promoter significantly reduces trichome branching, while TRM33 overexpressed line with GL2 promoter shows minimal trichome under branching. The TRM33-GFP protein is localized in the plasma membrane of cortical cells, while the TRM18-GFP signal is predominantly found on the nuclear envelope. The nuclear envelope and cell cortex are established non- centrosomal MTOCs in animal and plant cells. The localization of the TRM18 protein suggests a hypothesis that it may play a role in microtubule organization at that location. To understand the molecular function of TRM18 and TRM33 protein we are testing the function of their motifs in localization and cell shape.

SUBCELLULAR LOCALIZATION OF CANDIDATE MAGNETORECEPTOR MOLECULES IN *C. ELEGANS*

Presenter(s): Awe, Temitope, Graduate, Biological Sciences

Mentor: Dr. Andres Vidal-Gadea

Authorship: Temitope Awe, Aalimah Akinosho, Adina Fazyl, Wolfgang Stein, Andres Vidal-Gadea

The mechanisms underlying magnetoreception, the ability of organisms to sense the Earth's magnetic field, remain poorly understood. One hypothesis proposes that magnetic iron nanoparticles activate thermosensory receptors via a rotating magnetocaloric effect (RME). We previously demonstrated that the thermosensory AFD neurons mediate magnetic orientation behavior in the nematode C. elegans. Unpublished data from our lab, using reverse genetic screen approaches, have identified several candidate molecules that are required for magnetic orientation behavior in C. elegans. These molecules include the iron-binding proteins FTN-1 and FTN-2, the iron transporter SMF-3, and the temperature-gated channels GCY-8 and GCY-23. To investigate roles of these molecules in the magnetic transduction pathway of C. elegans, we examined their subcellular localization relative to the AFD sensory endings. Specifically, we focused on the location of these proteins relative to the sensory endings which are known to be ensheathed by AMsh glial cells. We found that FTN-2 is present in several tissues, including the AMsh glia. Within the AMsh glia, FTN-2 is localized near the thermosensory channel GCY-23, situated on the AFD sensory ending. Based on these findings, we propose a magnetoreceptor model in C. elegans involving FTN-2, GCY-23, AFD neurons, and AMsh glia. In this model FTN-2 binds iron nanoparticles within the AMsh glia. These nanoparticles, in response to magnetic fields, induce localized temperature changes via the RME, activating GCY-23 and transducing the magnetic signal in the AFD neurons. These findings provide a new insight for understanding the cellular and molecular basis.

MEVALUATING THE USE OF HIGH-FREQUENCY VOCALIZATIONS IN HUMMINGBIRD TERRITORIAL INTERACTIONSECHANISMS OF TEMPERATURE RESILIENCE IN NEURONAL PATTERN GENERATORS

Presenter(s): Baruah, Padmanav, Graduate, Biological Sciences

Mentor: Dr. Fernanda Duque

Authorship: Padmanav Baruah, Fernanda Duque

Birdsong serves to defend territories and/or attract mates. Some hummingbird species sing and display to both conspecific and heterospecific competitors. Such agonism often determines access to food. Some such species produce high-frequency (HF) vocalizations (above 8 kHz), well beyond what birds are known to usually perceive (1-5 kHz). However, it is not known if HF vocalizations are directed only at conspecifics or at other species as well, when defending resources. Boissoneaua flavescens and Adelomyia melanogenys are two species of Andean cloud forest hummingbirds that produce HF vocalizations. Through our pilot studies, we have identified that these HF users engage in agonistic interactions with several other species, including HF users as well as non-users. These HF users use both HF and non-HF vocalizations at feeders when other species are present. However, it is not known if these vocalizations are directed differentially to conspecifics or heterospecifics, based on the capability of HF perception. Thus, the influence of HF vocalizations on maintaining hummingbird social hierarchies remains undetermined. Here, we aim to use video and audio recordings to document agonism between and within species and feeding success. This approach will help us understand the context, directionality, and ecological influences of HF vs non-HF vocalizations. Next, through playback experiments in captivity, we will determine if HF non-users respond to HF vocalizations, even when no other bird is present. We hypothesize that HF vocalizations are more frequently directed at and elicit more intense aggressive responses from HF users than non-users because the latter cannot perceive HF sounds. Altogether, our project seeks to uncover whether social dynamics and resource competition in hummingbird communities are influenced by the evolution of HF vocal production in some hummingbird species.

INVESTIGATING A GENE DRIVER IN *NEUROSPORA CRASSA*

Presenter(s): Batula, Shadiyat, Undergraduate, Biological Sciences

Mentor: Dr. Tom Hammond

Authorship: Shadiyat Batula, Tom Hammond

Gene drivers are genetic elements that bias their transmission to offspring, making them potential tools for controlling harmful organisms. In *Neurospora* fungi, the gene drive partners *rsk* and *rfk-1* work together within a selfish genetic element called *Sk-2* to increase their chance of being inherited by offspring. Likewise, *rsk* also works with a gene in a related genetic element called *Sk-3*, but the identity of this gene is unknown. Previous studies have found that *rsk(Sk-3)* gene drive fails when a critical DNA interval, *i350*, is deleted. In this study we are examining the role of DNA intervals *i372* and *i403* in gene drive. Our findings will help identify *rsk(Sk-3)'s* partner gene and aid the development of synthetic gene drivers for use in the control of harmful organisms.

DEVELOPING NOVEL PROTEIN INTERACTION ASSAY FOR ARABIDOPSIS AND N. BENTHEMANIA

Presenter(s): Block, Mary, Undergraduate, Biological Sciences
Draper, Olivia, Graduate, Biological Sciences

Mentor: Dr. Viktor Kirik

Authorship: Mary Block, Olivia Draper, Viktor Kirik

Protein-protein interactions (PPI) are fundamental to elucidate molecular functions driving developmental and cellular processes. Development of a novel Plant Two-Hybrid (P2H) assay will facilitate PPI testing and will provide a plant cell based alternative to the Yeast Two-Hybrid (Y2H) assay. Similar to Y2H, the P2H assay is based on the principle of the reconstitution of a transcription factor in the event of protein-protein interaction. The Gal4 DNA binding domain (DBD) and the VP16 activation domain (AD) are used as two parts of a transcription factor which induces the expression of the nuclear reporter gene Histone-EGFP. To validate the feasibility of the P2H, GL3 and Myb23 proteins, which have been previously shown to interact in a Y2H assay, will be used as a positive control. The expression of these proteins is driven by trichome specific promoters for easy screening. The construction of a universal P2H system will facilitate the quantification of PPI in plant cells using the intensity of the reporter gene expression. This assay can be performed both endogenously in *Arabidopsis* and transiently in *N. benthemania* to confirm positive protein-protein interactions *in planta*. Transient expression in *N. benthemania* provides researchers with a quick screen for positive interactions. In addition, FLIM-FRET microscopy will be used independently to validate P2H. The combination of proximity-based interaction data obtained with FLIM-FRET, and a visualization of positive interactions by P2H will allow researchers to robustly detect PPI *in planta*.

THERAPEUTIC POTENTIAL OF SHORT DYSTROPHIN ISOFORMS IN DUCHENNE MUSCULAR DYSTROPHY

Presenter(s): Annabelle Dunaway, Undergraduate, Biological Sciences

Mentor: Dr. Andrés Vidal-Gadea

Authorship: Annabelle Dunaway, Adina Fazyl, Shifat Niha, Andrés Vidal-Gadea

Duchenne muscular dystrophy (DMD) is a severe genetic disorder caused by mutations in the dystrophin gene (*dys-1*), leading to the loss of its protective function in muscle cells. The absence of dystrophin results in elevated intracellular calcium levels, muscle fiber damage, and progressive mechanical dysfunction. While the full-length dystrophin isoform is primarily expressed in skeletal muscle, several short dystrophin isoforms are generated through alternative splicing and promoter variation. These shorter isoforms may offer therapeutic potential by partially compensating for dystrophin loss.

This study investigates whether short dystrophin isoforms (*dys-1B* and *dys-1E*) can mitigate motor deficits in dystrophic *Caenorhabditis elegans*. We aim to assess the impact of these isoforms on muscle function by modulating their expression in dystrophic nematodes. qPCR will be used to quantify isoform expression levels, while the TIERPSY system will track and analyze crawling and swimming kinematics to evaluate motor performance. We hypothesize that overexpression of *dys-1E* will significantly improve locomotor output in dystrophic animals compared to both control groups and *dys-1B* overexpression models.

This research provides critical insights into the functional contributions of short dystrophin isoforms and their potential role in therapeutic strategies for DMD. By exploring how endogenous dystrophin isoforms modulate muscle function, we aim to inform novel treatment approaches that leverage these naturally occurring variants to restore partial dystrophin function in DMD patients.

ADAPTIVE RESILIENCE AGAINST SPREADING DEPOLARIZATION IN MIGRAINE DISORDERS

Presenter(s): Galvan, Pedro, Undergraduate, Biological Sciences
Nelson, Ella, Undergraduate, Biological Sciences
Spena, Abigail, Undergraduate, Biological Sciences

Mentor: Dr. Wolfgang Stein

Co-Mentor: Dr. Allison Harris

Authorship: Pedro Galvan, Ella Nelson, Abigail Spena

Spreading depolarization (SD) is a slowly propagating wave of neuronal hyperexcitability that travels across large areas of the cortex in disorders such as ischemia, stroke, and traumatic brain injury. Accompanied by swelling of neurons, large changes in ion homeostasis, and neuronal inactivity (spreading depression), SD can have debilitating consequences even in otherwise healthy brains. Its effects are probably best known for causing visual auras that precede the headache pain in about 30% of all migraineurs.

While SD propagation has been studied for decades, key questions about its initiation remain, including whether there are similarities or differences in how SD is elicited between individuals, whether repeated SD events facilitate or diminish the likelihood of subsequent SD events, and whether SD originates from a singular location or multiple sites. To address these questions, we have developed a high-throughput assay using fluorescent calcium imaging of SD in adult and larval fruit flies (drosophila melanogaster). Rapid cooling from room temperature to 0oC reliably elicited SD in adult brains and larval nervous systems. On average, SD occurred at 4.6±2.9°C (N=8) in adults and at 3.2±2.0°C (N=30) in larvae. However, there was substantial inter-animal variability in the temperature at which SD was elicited (range: 1.7 - 9.7°C in adults, 0.2 - 9.3°C in larvae). Inter-individual differences were directly tested in a paired approach that measured the temperature of SD occurrence in several (3 - 6) L2 larvae under identical conditions. We found a significant interaction between SD temperature and animal identity ($P<0.001$, One Way RM Anova), suggesting that inter-individual differences in resilience against SD exist.

Through repeated coolings that elicited SD, we found that increasingly colder temperatures were required to elicit subsequent SD events ($P<0.001$, RM Anova on Ranks, $\chi 2 = 31.22$). For example, the first SD event occurred on average at 3.2±2.0°C (N=30), while the fifth repetition required cooling to 0.4±1.0°C (N=10). The need for a significantly stronger temperature perturbation suggests that repeated SD events may make the nervous system more resilient against future SD events.

Finally, by tracking SD spread in adult brains, we found that SD was on average elicited at 3.5 distinct initiation sites per animal (N=6). The location of the leading initiation point varied across animals, suggesting that SD initiation is individualized.

Overall, our results demonstrate that SD provides adaptive resilience against future SD events and originates in multiple brain areas that vary between animals.

INVESTIGATING THE ROLE OF BIOFILM GENES IN UROPATHOGENIC Escherichia COLI

Presenter(s): Jacobson, Grady, Undergraduate, Chemistry

Mentor: Dr. Jan Dahl

Uropathogenic Escherichia coli (UPEC) is the most common cause of urinary tract infections (UTI) in the United States today. These bacteria exist harmlessly in the gut but can turn into serious pathogens upon entering the urinary tract, where they must resist host defense mechanisms before colonizing the epithelial cells. Among those may be the ability to withstand reactive chlorine species, which are highly antimicrobial oxidants produced by innate immune cells. Our lab has shown that UPEC's increased RCS defense is linked to the RcrR regulon, a UPEC specific gene cluster absent in non-pathogenic and intestinal E. coli. The RcrR regulon consists of the three genes rcrR, rcrB, and rcrA. RcrB has been characterized by graduate research students in our lab, but less is known about rcrA. Based on sequence comparisons we hypothesized that RcrA plays a role in biofilm formation, which is one of protective mechanisms utilized by UPEC to colonize and survive in the bladder. Along with RcrA, there are two other genes outside of the rcrR regulon believed to play roles in biofilm formation, which have structural and genetic similarities with RcrR. I utilized in vitro and in vivo assays to determine the role of RcrA, along with those of the other two orthologs. My data show that UPEC strains lacking rcrA or ycfR have are less pathogenic in a Galleria melonella infection model compared to wildtype-infected larvae, however, when both genes were deleted, UPEC becomes more pathogenic. Characterizing the roles of these genes will allow greater understanding of the defense mechanisms utilized by UPEC, and will elucidate ways to combat the pathogen.

CAN ANTIOXIDANTS PREVENT THE NEGATIVE EFFECTS OF THERMAL STRESS ON EMBRYONIC DEVELOPMENT?

Presenter(s): King, Lilly, Undergraduate, Biological Sciences

Mentor: Dr. Ryan Paitz

Authorship: Lilly King, Ryan Paitz

As climate change continues to increase the frequency of heat waves, it is important to understand how developing embryos respond to heat exposure. We hypothesized that embryos are more sensitive to heat exposure early in development. To test this, we divided chicken eggs into 3 treatment groups exposed to heat (102°F) at different times of development. We then dissected and weighed the embryos. These results did show a difference in the average survival, as the embryos exposed to 102 degrees during the first week of development had a lower survival rate than the embryos exposed to 102 degrees at week two. From these results we understand that exposure to high temperatures at different points affects gestational development differently. We then tested the hypothesis that early heat exposure results in reduced growth and survival due to oxidative damage. To test this, we injected eggs with Trolox, a known antioxidant, to potentially prevent the detrimental effects of heat exposure during the first week of development. Trolox is a water-soluble vitamin E derivative, in previous studies Trolox has been demonstrated to protect the embryos against oxidative stress. We divided the eggs into two groups, one which contained eggs injected with Trolox and exposed both groups to 102 degrees during week one of development. After dissecting and weighing the embryos, our results did not show any significant differences in the survival of chicken embryos. Therefore, exposure to 102 degrees during the first week of development is detrimental to the embryo despite the antioxidant.

INVESTIGATING SPORE SACS AND *SK-3*-BASED SPORE KILLING AFTER DELETION OF *NEUROSPORA CRASSA* DNA INTERVALS *i382* and *i400*

Presenter(s): Klann, Makenna, Undergraduate, Biological Sciences

Mentor: Dr. Tom Hammond

Authorship: Makenna Klann, Tom Hammond

Neurospora crassa is a genus of fungus found in climates that consist of tropical, subtropical, and temperate environments, and serves as a model organism for genetic research. *N. crassa* is well known as a useful model for eukaryotic molecular genetics. In *N. crassa*, meiotic drive can be observed in fungal spore killing. *Spore killer-3 (Sk-3)* is a selfish genetic element transmitted to offspring through spore killing, and in *N. crassa,* it is located on Chromosome III. *Sk-3* is thought to contain two principal components: a killer (poison) gene and a resistance (antidote) gene. While the resistance gene (*rsk*) has been identified, the killer gene remains unknown. The focus of this study is to refine the location of the killer gene through deletion analysis of DNA intervals *i382* and *i400*. Previous research suggests that these intervals are near or within a region of Chromosome III that is required for spore killing. Here, I present the current results of my research. My results will be used to precisely define the location of the *Sk-3* killer gene, which is a critical step towards understanding processes that allow for the evolution of *Sk-3*-type selfish genetic elements.

MANAGED VERSUS UNMANAGED LAND USE AND ORB-WEAVING SPIDER BIODIVERSITY

Presenter(s): Long, Brenna, Undergraduate, Biological Sciences

Mentor: Dr. Ben Sadd

Co-Mentor: Dr. Rachel Bowden

Authorship: Brenna Long, Austin Calhoun, Rachel M. Bowden, Ben M. Sadd

Understanding biodiversity change is important for making conservation-conscious land management decisions, with variation affected by environmental conditions and management intensity. Often, management is considered detrimental to biodiversity, but this may depend upon context and disturbance intensity. Due to rapid succession in the neotropics, disturbances in managed areas may create microhabitats supporting more biodiversity than unmanaged areas. Diversity can be compared using alpha diversity within sites, including species richness, abundance, and evenness, and beta diversity between sites, indicating community distinctness. Bioindicator taxa, such as orb-weaving spiders, are useful to assess biodiversity due to their sensitivity to environmental and trophic changes. We hypothesize land management strategy will affect orb-weaver alpha and beta diversity due to regular habitat disturbance associated with management. We predict that managed will have greater alpha diversity than unmanaged land, and beta diversity will be lowest, or have most similar communities, between sites of the same management type and highest, or most different, between management types. Four areas at La Selva Biological Station, Costa Rica, were selected to assess orb-weaver diversity, including managed (Successional Plots and Arboretum) and unmanaged areas (Old-growth Forest and Abandoned Plantation). Methodical sampling was conducted three times per site, with morphospecies identified. Alpha diversity (richness, abundance, and Shannon diversity) was higher in managed versus unmanaged sites. Moreover, as predicted, beta diversity was lower within management types than between them. This work adds to our understanding of how land management intensity affects biodiversity of animal communities, which is vital for making conservation and management strategies decisions.

INVESTIGATING THE MECHANISM OF RFK-1-BASED SPORE KILLING IN NEUROSPORA

Presenter(s): Mahmud, Shahriar, Graduate, Biological Sciences

Mentor: Dr. Tom Hammond

Authorship: Shahriar Mahmud, Gabriela Mendoza-Rangel, Nick Rhoades, Tom Hammond

Meiotic drives are selfish genetic elements that bias their own transmission during meiosis at the expense of competing alleles. In the sexual life cycle of *Neurospora crassa*, each ascus typically produces eight black ascospores. However, crosses between heterozygous strains—where one parent carries the spore killer element *Sk-2* and the other lacks it—result in complete segregation distortion, yielding asci containing four viable black ascospores and four inviable white or dead ascospores. The *Sk-2* element, originally identified in *N. intermedia*, has been introgressed into *N. crassa* to study meiotic drive mechanisms in sexual tissues. Our research has identified a critical gene within *Sk-2*, designated as *rfk-1* (required for killing). The *rfk-1* gene contains three introns and four exons, with the first intron exhibiting unusual features, including a length of 46–48 base pairs, seven repetitive sequences, and two in-frame stop codons. This study aims to identify the minimal functional version of *rfk-1*. To address this, we employed PCR-based deletion of non- coding intervals and generated strains with combinatorial differences in introns and exons. We also examined the effect of four synonymous codon modifications. These rfk-*1*variants exhibited varying toxicity levels in vegetative tissues, with some strains showing pronounced toxicity and others minimal effects. We also investigated epitope tagged versions of RFK-1. Our preliminary results suggest that placing the FLAG tag at either the N- or C-terminus of RFK-1 disrupts its function.

LIGHT-INDUCIBLE CONTROL OF RSK EXPRESSION: A NOVEL SYSTEM FOR STUDYING SPORE KILLER RESISTANCE IN NEUROSPORA

Presenter(s): Mendoza-Rangel, Grabriela J., Graduate, Biological Sciences

Mentor: Dr. Thomas Hammond

The resistance to spore killer gene (*rsk*) is responsible for protecting ascospores in Neurospora against a phenomenon known as spore killing. Spore killers are a type of selfish genetic elements that increase their own transmission to the next generation by taking advantage of other genes or mechanisms such as meiosis. In Neurospora, four of the eight ascospores produced are killed by the killer gene rfk-1, and four survive due to the effect of *rsk*. How *rsk* protects ascospores against the killer is not well understood. Moreover, the *rsk* gene does not have recognizable domains and seems to be specific to fungi. Here, I show a system for identifying domains and studying RSK function in vegetative cells. In this system, I demonstrate that *rsk* expression can be controlled with light by using the light-inducible *vvd* promoter. The system allows for precise temporal control or specific tissue control of *rsk* expression.

TEMPERATURE AND CORTICOSTERONE INTERACTIONS: EFFECTS ON CHICKEN EMBRYONIC GROWTH AND DEVELOPMENT

Presenters: Montalbano, Caitlin, Undergraduate, Biological Sciences

Mentor: Prof. Ryan Paitz

Environmental factors such as temperature play a critical role in embryonic development. Small variations in incubation temperature have profound effects, such as directly affecting hatchling size and survival rate**.** Furthermore, corticosterone is known to hinder embryonic growth. In this study we were interested in examining how incubation temperature affected growth and survival in chicken embryos and whether corticosterone, a stress hormone, altered the effect of temperature on developing embryos. We hypothesized the embryonic response to temperature would change when embryos were exposed to corticosterone. To test this hypothesis two experiments were conducted. In the first experiment, eggs were incubated at 96°F, 98°F, and 100°F to assess how temperature alone influences development. Our results showed embryos incubated at 100°F had the greatest mass, those at 98°F had intermediate growth, and those at 96°F had the smallest growth. In the second experiment, eggs were incubated at 98°F, 100°F, or 102°F. Half of the eggs received corticosterone injections. Our results revealed that corticosterone did not affect growth at 98°F, but growth was reduced at 100°F and 102°F. Moreover, 102°F negatively affected embryonic growth regardless of corticosterone exposure; indicating this temperature may be beyond the optimal incubation temperature. These results suggest that the embryonic response to temperature is dependent upon corticosterone levels in the egg. Results from this study provide insight into how environmental stressors interact during early embryonic development.

REFINING THE LOCATION OF A KILLER GENE IN NEUROSPORA CRASSA

Presenter(s): Paulikas, Paulina, Undergraduate, Biological Sciences
Sands, Julia, Undergraduate, Biological Sciences
Paeth, Mollie, Undergraduate, Biological Sciences,
Rimmey, Allison.Undergraduate, Biological Sciences
Mentor: Dr. Tom Hammond
Authorship: Paulina Paulikas, Julia Sands, Mollie Paeth, Allison Rimmey, and Tom Hammond

Neurospora is a genus of fungus found in a wide range of living conditions. There are five species of Neurospora, the genetic model being *Neurospora crassa*. All five species produce spores, which can be either asexual or sexual. Sexual spores are produced during mating by meiosis and are called ascospores. When *N. crassa* undergoes sexual development, it proceeds through many developmental phases to eventually produce spore sacs called asci. The expected result is that each ascus should contain eight black viable ascospores. However, there are selfish genetic elements in Neurospora called Spore killers, and when a strain carrying a Spore killer mates with a Spore killer susceptible strain, asci contain four black viable ascospores and four white inviable ascospores. We are investigating the *Sk-3* Spore killer. *Sk-3* is thought to require a killing (poison) gene and a resistance (antidote) gene. The *Sk-3* resistance gene (*rsk*) has been identified, but the killer gene is unknown. The purpose of this study is to help identify the killer gene. To do this, we have deleted two DNA intervals (*i383* and *i385*) and determined that deletion of *i383* but not *i385* correlates with loss of spore killing. We are currently examining four additional intervals (*i358, i394, i395,* and *i405)* and our results will be used to refine the location of the killer gene.

EFFECTS OF INCUBATION TEMPERATURE AND ESTROGEN TREATMENT ON THE EXPRESSION OF HEAT-SHOCK PROTEINS IN EARLY TURTLE EMBRYOS

Presenter(s): Rollins, Jacob, Undergraduate, Biological Sciences

Mentor: Dr. Rachel Bowden

Co-mentor: Dr. Ryan Paitz

Authorship: Jacob Rollins, Madison B. Wilken, Clinton Warren, Rachel M. Bowden, Ryan T. Paitz

Vertebrates, such as turtles, are highly sensitive to incubation temperatures during embryonic development. Embryos must be able to withstand extreme conditions such as high heat. Heat- shock proteins (HSP) are a well-studied mechanism that may safeguard the embryo's cellular proteins from denaturing when exposed to extreme temperatures. However, the response of HSP in embryos is not well-studied and it remains unknown how incubation temperatures affect their HSP response to transient heat or how steroidal hormones deposited in the yolk, such as maternal estrogens, would affect the induction of HSP. In our current study, we investigated the effects of estrogen treatment, developmental time (6, 12, and 18 days), and consistent exposure to cool (26±3°C) or warm (31±3°C) incubation temperatures on HSP expression early in the development of red-eared slider turtles. We found that the expression of some HSPs, such as *HSPH1* and *HSP70A5*, were not significantly influenced by either incubation or estrogen treatment. However, *HSPH1* did exhibit a steady decline in expression across this early window of development regardless of temperature or estrogen treatment. Meanwhile, incubation temperature had pronounced effects on the expression of other HSPs. For example, *HSP90AA1* and *HSP70A8* diverged in expression between cool and warm incubation treatments by days 12 and 18, respectively, in which their expression was surprisingly higher under the cool incubation treatment. Finally, we observed complex interactive effects involving temperature, incubation day, and estrogen treatment for *HSP90B1*. In conclusion, our findings suggest that incubation temperature and (to a lesser extent) exposure to maternal estrogens, might moderate developmental changes in HSP expression in red-eared slider turtle embryos.

ASSESSING SPATIAL NAVIGATION AND BRAIN PLASTICITY AS A RESPONSE TO URANIZED LANSCAPES IN *MUS MUSCULUS*

Presenter(s): Romps, Sydney, Graduate, Biological Sciences

Mentor: Dr. Javier delBarco-Trillo

Authorship: Sydney Romps, Javier delBarco-Trillo

An animal's ability to encounter a novel environment and successfully identify food, conspecifics, and threats is essential for an individual's survival and reproductive success. In a rapidly urbanized world, animals must respond to environmental changes quickly. Previous work has shown that urbanization can increase boldness, aggression, stress, and depression in urban animals. However, studies on spatial navigation in an urban environment are relatively scant and have mainly focused on human spatial navigation. I am conducting a project in which I will take an interdisciplinary approach to investigate the impact of urbanization on the spatial navigation and the underlying neural mechanism of a wild animal: Mus musculus, or the house mouse. The house mouse has evolved to live in close proximity to humans, thriving in urban environments. By comparing spatial navigation tasks and neuron cell densities between urban and rural house mice, I will determine the scope and flexibility of a wild animal's behavioral response to urban environments and some basic information about the brain areas involved in such response. For this project, individual mice will be trained on the radial maze and tested to remember baited arms. Comparisons between urban and rural mice will determine any differences in behavioral responses to urban environments. To provide basic information about brain areas involved in the behavioral response, neuron cell densities will be calculated from a random subsample of mice in regions of the hippocampus, which is a brain region associated with memory and learning. The methods proposed here will be repeated for at least one generation produced from the sampled populations to determine whether spatial navigation responses are due to phenotypic plasticity or evolutionary adaptations. The overall project aims to provide foundational information to determine how well a wild animal may respond to the rapid development of human-dominated landscapes, especially as habitat fragmentation continues to be a growing threat for biodiversity worldwide.

SIGNAL TRANSMISSION OF BAY WREN DUETS AND SOLO SONGS

Presenter(s): Schinzler, Rachel, Graduate, Biological Sciences

Mentor: Dr. Carlos Rodríguez-Saltos

Authorship: Rachel Schinzler, Carlos Rodríguez-Saltos

Duets are cooperative vocal signals that may be used for joint territory and resource defense, mate guarding, reproductive pair synchrony, or pair bond maintenance. Neotropical wrens perform duets that involve both a male and a female. Bay Wrens (*Cantorchilus nigricapillus*) also perform solos, albeit not as frequently as duets. In this study, we evaluated the acoustic transmission of solos and duets of Bay Wrens in their habitat, the tropical rainforest. We found that compared to solos, duets experience lower attenuation in the forest, defined as the decrease in signal-to-noise ratio. This result suggests that duets are better adapted for long-range transmission and may explain why Bay Wrens use duets more frequently than solos. The decreased transmissibility of solo songs may imply an evolutionary trade-off between individual and cooperative singing in wrens.

MECHANISMS OF TEMPERATURE RESILIENCE IN NEURONAL PATTERN GENERATORS

Presenter(s): Steiger, Charlotte, Graduate, Biological Sciences

Mentor: Dr. Wolfgang Stein

Authorship: Charlotte Steiger, Wolfgang Stein

Rapidly changing temperatures are a major challenge to neuronal function. This can cause an imbalance of ionic conductances that are key to normal neuronal and synaptic activity. This is a threat for ectothermic species that experience rapid environmental temperature fluctuations, like natural and climate-change related weather extremes. Nevertheless, some species possess physiological mechanisms that can mitigate the effects of temperature changes in the nervous system and as a result withstand a wide range of temperatures. Our lab has previous data that suggest that the regulation of ionic currents in the nervous system enables temperature robustness by improving neuronal excitability. I am testing this hypothesis by investigating the effects of acclimation on neuronal excitability in the stomatogastric nervous system of Green crabs (*Carcinus maenas*). I acclimate adult green crabs to 10°C and 20°C and compare neuronal responses to a temperature challenge between them. For this, I dissect the stomatogastric nervous system and use extracellular nerve recordings to determine its rhythmic activity before and after acclimation. In addition, I will intracellularly from the pyloric dilator (PD) neuron - the main pacemaker neuron that drives the rhythm to determine whether its excitability is altered by acclimation. My preliminary data shows that after acclimation, the rhythmic activity of the PD neuron remained regular at higher temperatures than the control trials, suggesting that acclimation to new temperature habitats shifts neuronal responses to better fit the new temperature conditions. I am currently using current injections into the PD neuron to measure membrane excitability before and after acclimation, and I will measure ionic conductances known to underlie rhythmic neuronal activity such as the transient outward K+ current (I_A) and the hyperpolarization-activated inward current (I_h).

THE LINK BETWEEN MALE AGGRESSION AND IMMUNITY: A CRITICAL BUT NEGELCTED LIFE-HISTORY TRADE-OFF

Presenter(s): Szwed, Sydney, Graduate, Biological Sciences

Mentor: Dr. Ben Sadd

Co-Mentor: Dr. Scott Sakaluk

Life-history theory posits that organisms distribute limited resources among growth, maintenance, and reproduction. Across many species, male aggression determines access to females and hence reproductive success, whereas immunity contributes to maintenance, ensuring survival and future mating. We hypothesize that there is a trade-off between investment in aggression and immunity. This trade-off could be realized through one of two non-mutually exclusive routes, with immune investment determined by either an intrinsic difference in male investment in aggression and immunity, independent of their deployment, or through direct costs of competitive interactions. This study investigates the nuances of the aggression-immunity trade-off in male field crickets, *Gryllus assimilis*, to determine, (i) whether the outcome of aggressive interactions is associated with baseline immune investment, and (ii) how engaging in aggression affects future immunity. Male aggression is being quantified and combined with assays of cellular and humoral immunity. We predict lower baseline immunity in subsequently dominant males compared with subordinate males, demonstrating an intrinsic cost of investing in aggression. Additionally, we predict that engaging in aggression will decrease immunity relative to control males, with the reduction more pronounced in higher investing, dominant males. This work will provide important insights into a frequently assumed, but understudied, trade-off between aggression and immunity. An integrative assessment of this trade-off will contribute to our understanding of factors maintaining variation in immunity and other life history traits.

THE IMPACT OF URBANIZATION ON THE ULTRASONIC VOCALIZATIONS OF WILD HOUSE MICE (M. MUSCULUS)

Presenter(s): Thomas, Lydia, Graduate, Biological Sciences

Mentor: Dr. Javier delBarco-Trillo

Authorship: Lydia Thomas, Javier delBarco-Trillo

Urbanization is a source of great concern regarding its influence on surrounding wildlife. Anthropogenic activity in urban areas has been found to affect many aspects of wildlife ecology, including physiology, demography, morphology, and behavior. The impact of increased anthropogenic noise on acoustic communication among urban animals has been a subject of particular interest. This has been studied in a wide array of taxa, including birds, prairie dogs, and crickets. The influence of urbanization on vocalizations that are outside the range of human hearing (greater than 20 kHz), however, has not been rigorously investigated. House mice (Mus musculus) produce these vocalizations, known as ultrasonic vocalizations, or USVs. House mice use USVs in three main social contexts: courtship and mating, competition or territoriality, and maternal care. These vocalizations have been thoroughly characterized in laboratory mice; however, little work has been done on wild mice. The proposed project will analyze the USVs of urban and rural house mice within the courtship, competitive, and maternal care contexts. Mice will be trapped in highly urban and highly rural areas within the locales of Chicago, IL and Bloomington-Normal, IL. Further analysis of additional generations bred in captivity will illuminate the degree to which these vocalizations are plastic, as well as the impact of environmental input on their characteristics. The results from this study will add to the literature regarding the effects of urbanization on wildlife behavior, in addition to informing efforts for the mitigation of human-wildlife conflict in the future.

SOCIAL RESURRECTION: EXPLORING IF SOCIAL INTERACTIONS RESTORE DISTURBED BENEFICIAL MICROBIAL COMMUNITIES OF BUMBLE BEES

Presenter(s): Timsina, Ravi, Graduate, Biological Sciences
Emmert, Paul, Undergraduate, Biological Sciences
Rehberger, Jade, Undergraduate, Biological Sciences
Mentor: Prof. Ben Sadd
Authorship: Ravi Timsina, Paul Emmert, Jade Rehberger, Ben Sadd

Eusociality represents a major evolutionary transition. Eusociality, and social living more generally, have several associated benefits but also counter costs, affecting their evolution. The ecological dominance of eusocial insects suggests advantages of group living; benefits including reduced predation risk, better resource utilization, and increased tolerance of adverse conditions. Conversely, costs include greater likelihood of pathogen transmission due to individual proximity and high relatedness. However, little attention has been given to the transfer of beneficial microbes among group individuals as an additional benefit of sociality. Both intrinsic, including host immunity, and extrinsic factors, including infection and antibiotic exposure, can disrupt the structure and functioning of a beneficial microbiota, leading to dysbiosis. We hypothesize that sociality can maintain a healthy gut microbiota, with social interactions facilitating the spread of beneficial microbes or resurrecting beneficial microbial communities following dysbiosis. Using the bumble bee *Bombus impatiens*, we will test this hypothesis by disturbing a focal individual's gut microbiota through a stimulation of host immunity or antibiotic treatment, and subsequently expose these individuals to solitary or social settings. Subsequently, we will assess gut microbiota structure and health effects of focal individuals. We predict that dysbiotic gut microbial communities will be resurrected by social interactions, accompanied by associated health benefits. This work will further our understanding of host-microbiota relationships, including how social transmission of beneficial microbes may favor the evolution of social living.

WHERE ART THOU SK-3 SPORE KILLING GENE? REFINING THE LOCATION OF A FUNGAL SPORE KILLING GENE THROUGH DNA DELETION ANALYSIS

Presenter(s): Tobin, Ellana, Undergraduate, Biological Sciences
Kedzierzawski, Tim, Undergraduate, Biological Sciences
Spriggs, Alexandra, Undergraduate, Biological Sciences
Aguado, Danielle, Undergraduate, Biological Sciences

Mentor: Dr. Tom Hammond

Authorship: Ellana Tobin, Tim Kedzierzawski, Alexandra Spriggs, Danielle Aguado, Tom Hammond

Neurospora crassa, a genetic model of fungal research, produces sexual spores called ascospores. It was discovered that ascospore maturation can be inhibited by Spore killers that are encoded within the genome, with the three known Neurospora spore killers being Sk-1, Sk-2, and Sk-3. Spore killing occurs when a killer strain mates with a sensitive strain, and through killing, the Spore killer strain ensures that all surviving offspring inherit its genetic content rather than that of the sensitive strain. The offspring that survive also inherit a resistance gene from the Spore killer strain. This gene is called called rsk and it allows the offspring to survive the killing process. However, the offspring also inherit one or more killer genes. The identities of these genes are unknown. In this study, we are seeking to refine the location of a gene that controls spore killing. By deleting various DNA intervals (i396, i401, i402, and i407) that are thought to be located near or within a gene required for spore killing, we hope to help precisely map where this gene is located.

EFFECTS OF EARLY HEAT EXPOSURE ON HEAT-SHOCK PROTEIN RESPONSIVENESS IN TURTLE EMBRYOS

Presenter(s): Warren, Clinton, Graduate, Biological Sciences

Mentor: Dr. Rachel Bowden

Co-Mentor: Dr. Ryan Paitz|

Authorship: Clinton Warren, Madison Wilken, Ryan Paitz, Rachel Bowden

The induction of heat-shock proteins (HSP) during the development of oviparous ectothermic vertebrates, such as turtles, may be an important compensatory response during exposures to transient heat. However, it is not well known when the embryos of such species develop the capacity to induce HSPs in response to heat or how early incubation temperatures might affect their responsiveness to subsequent exposures. From a recent study using red-eared slider turtles (Trachemys scripta), we have observed that the expression of several HSP genes in the trunks of embryos markedly declined during early development at both control (no transient heat) temperatures and those repeatedly exposed to transient heat. Surprisingly, the rate of this decline in HSP expression appeared to be faster in embryos exposed to transient heat which may be tied to an increase in their developmental rate. In our current study, we expand upon these findings by examining HSP expression following different heat exposures (0, 1, 2, or 3 exposures to transient heat) and extending sampling to later in development to better characterize ontogenetic changes. Our results over the two study years suggest that the effects of transient heat on HSP expression depend on when in development the exposure occurs and whether it is novel or recurring. We conclude that the expression of HSPs early in T. scripta development is dynamic and thermally responsive, with most declining naturally with the progression of development, yet many experiencing an accelerated decline and/or temporary induction in response to transient heat exposures.

IDENTIFYING A CRUSTACEAN TACHYKININ RELATED PEPTIDE RECEPTOR THAT CONTRIBUTES TO NEURONAL TEMPERATURE RESILIENCE

Presenter(s): Whittington, Lily, Undergraduate, Biological Sciences

Mentor: Prof. Wolfgang Stein

Authorship: Lily Whittington, Mackenzie Seymour, Wolfgang Stein

Global warming and the associated changing environmental temperature conditions pose a severe threat to animals and the survival of whole species. Invertebrates, and in particular aquatic species, are more sensitive to environmental temperature changes than other animals but have also evolved many strategies to regulate their response to changes in their environment. The nervous system is at the core of these responses as it controls all behaviors and is responsible for internal communication of these changes, thus allowing for adequate responses. Recently, a class of neuromodulators called tachykinin-related peptides - chemical signals that the brain uses to alter neuronal responses - have been found to dramatically improve temperature robustness in crustacean neurons. While their cellular actions are well understood, the receptors that bind these neuropeptides and mediate those responses are currently unknown. Tachykinin- related peptides are a family of neuropeptides that are typically expressed in the brain and gut of vertebrates and invertebrates. They modulate various physiological processes, including the excitability of neurons and their ability to respond to synaptic communication in the nervous system. Identifying their receptors is thus a necessary step in understanding how they mediate neuronal function and successfully regulate animal responses to provide thermal protection to the nervous system. This project aims to identify the tachykinin-related peptide receptor underlying temperature resilience in crustacean neurons, specifically in the green crabs, *Carcinus maenas*. We hypothesize that the identified receptor sequences will bind to decapod crustacean tachykinin-related peptides using an established frog oocyte gene expression system. We will express the putative receptors and test their binding ability to tachykinin- related peptides using state-of-the-art electrophysiology.

ROLE OF DYSTROPHIN ISOFORMS IN SMOOTH MUSCLE FUNCTION DURING DUCHENNE MUSCULAR DYSTROPHY

Presenter(s): Wilderman, Rene, Undergraduate, Biological Sciences

Mentor: Dr. Andrés Vidal-Gadea

Authorship: Rene Wilderman, Adina Fazyl, Andrés Vidal-Gadea

The structural protein dystrophin is essential to muscle function by providing stability and protection from mechanical stress such as muscle contraction. Many studies have investigated the role of dystrophin in striated muscles, particularly in diseases such as Duchenne Muscular Dystrophy (DMD). However, dystrophic diseases affect more than just striated muscle tissue. Smooth muscle is crucial for many involuntary movements in tissues such as the esophagus, stomach, uterus and more, yet the effects of the structural protein dystrophin and related dystrophic diseases remain understudied in this tissue type. Caenorhabditis elegans (C. Elegans) act as a strong model system for studying dystrophin function having multiple dystrophin isoforms corresponding to different tissue types, including dystrophin E present in uterine smooth muscle. Investigating dystrophin function in the smooth muscle of C. Elegans contributes to the understanding of how muscle-wasting diseases such as DMD would impact smooth muscle function in humans.

In this study we investigate the impact of dystrophin proteins in smooth muscle by the measuring of egg- laying behavior in C. elegans. We compare wild-type control nematodes with dystrophic (dys-1 mutant) nematodes and two dystrophin rescue strains. Dystrophin E is expressed in uterine smooth tissue, while dystrophin B is not. Dystrophic nematodes exhibited a significantly lower egg laying frequency compared to the wild type indicating smooth muscle impairment in the uterine tissue when dystrophin is dysfunctional. Rescue with dystrophin E increased egg-laying frequency supporting the hypothesis that dystrophin E has an important presence in uterine smooth muscle. Rescue with dystrophin B gene did not increase egg laying frequencies. Further, confocal imaging of uterine muscles displayed abnormalities in smooth muscle structure in dystrophic nematodes which were also present in dystrophin B rescues nematodes. Imaging of dystrophin E rescue nematodes exhibited significantly less structural defects.

This study provides insight into the importance of dystrophin isoform E in the function of smooth muscle. Identifying tissue-specific isoforms of dystrophin relating to certain functions contributes to the understanding of dystrophic diseases such as DMD. Additionally, investigating the potential of rescue strategies with different dystrophin isoform genes helps inform future therapeutic approaches aimed at alleviating symptoms. Future studies may explore co-expression of multiple isoforms in specific tissue types or examine other smooth muscle functions impacted by muscular dystrophy.

CHEMISTRY

A SUPRISING REARRANGEMENT OF PYRONE-AMIDES

Presenter(s): Alende, Joy, Graduate, Chemistry

Mentor: Dr. Andy Mitchell

Authorship: Joy Alende, Andy Mitchell

Cycloaddition reactions, a cornerstone of organic synthesis, typically involve a concerted mechanism, as exemplified by the renowned Diels-Alder [4+2] reaction. However, the less explored [5+2] cycloadditions featuring oxidopyrylium intermediates demonstrate a fascinating divergence from this norm. Depending on the nature of the tethers attached to the oxidopyrylium, these reactions can deviate from a concerted pathway and instead proceed through stepwise mechanisms. Intriguingly, our investigation utilizing a di- carbonyl amide tether on the oxidopyrylium system unexpectedly yielded a rearrangement product rather than the anticipated cycloaddition adduct. We propose a mechanistic pathway for this transformation, encompassing a conjugate addition, a retro-electrocyclization, and a subsequent intramolecular aldol reaction. We have optimized the conditions for this novel rearrangement reaction, and are currently exploring the scope and limitations.

DEVELOPING A SUBSTRATE SPRAY MASS SPECTROMETRY-BASED METHOD FOR PROCESSING FINGERNAIL SCRAPING EVIDENCE FOR EXOGENOUS CHEMICAL SCREENING

Presenter(s): Anderson, Madelynn, Undergraduate, Chemistry

Mentor: Dr. Christopher Mulligan

Authorship: Madelynn G. Anderson, Makenna S. Klann, Emily J. Wiggins, Christopher C. Mulligan

Studies have shown that modified electrospray ionization-mass spectrometry (ESI-MS) can be performed with many different substrates (such as wood, paper, etc.), allowing for the analysis of target analytes, such as drugs of abuse. Here, we investigate the capabilities of a commonly-available toothpick used for its rigidity and porosity, allowing for fingernail scraping applications in forensic applications.

A toothpick is employed for its ability to directly sample under the hyponychium region of the nail. Toothpick optimization included balancing sampling efficiency and spray dynamics. Native contaminants were removed from the toothpick pre-sampling via a pre-soak process that also provides the benefit of improved analyte transfer. A sampling surface is produced by a mannequin hand with replaceable acrylic fingernails. Analytes in this study were common tactile drugs of abuse (eg. cocaine, methamphetamine, fentanyl, etc.). Spectral data was collected on a Thermo Q Exactive HRMS after depositing spray solvent.

In this study, we investigate a scrape-and-shoot approach with various substrates employed for exogenous chemical screening from tactile exposure events. Method optimization was performed by investigating ideal substrates, pre-soaking solution, spray solvent composition, voltage, and toothpick position relative to the MS inlet. Such parameter optimization is shown in this poster. Mock fingernail samplings were conducted and results showed that residual drugs down to the nanogram level can be reproducibly transferred and detected, demonstrated from repeated scrapes from the sample fingernail (up to 8 samplings) and after significant hand washing. Tertiary transfers, where analyte was deposited onto a surface and then scraped at with the mannequin hand before fingernail sampling, were also detectable.

SITE-SPECIFIC MONOCLONAL ANTIBODY MODIFICATION VIA MICROBIAL TRANSGLUTAMINASE TO IMPROVE ADSORPTION ONTO GOLD NANOPARTICLES

Presenter(s): Beitello, Emily, Graduate, Chemistry

Mentor: Dr. Jon Friesen

Co-Mentor: Jeremy D. Driskell

Authorship: Emily Beitello, Kwame Osei, Trent Kobulnicky, Jon Friesen, Jeremy Driskell

Gold nanoparticle (AuNP) antibody bioconjugates are being explored in the expanding research areas of drug delivery systems, imaging, and immunoassays. Currently, many methodologies are utilized to create AuNP-antibody bioconjugates; however, these mostly result in random orientation of the antibody which can lead to decreased activity. Previous studies have established that localized charges and free thiol functional groups aid in the orientation and affinity of proteins adsorbed to AuNPs. This research explores site-specific modification of antibodies to produce robust and oriented bioconjugates. Microbial transglutaminase (mTG) conjugates primary amines to the highly conserved Q295 residue on the Fc fragment of monoclonal antibodies. Here we investigate mTG-mediate conjugation of polypeptide sequences of lysine and cysteine to add additional positive charges and free thiols. Site-specific conjugation is confirmed through gel electrophoresis and western blots, and we establish the approach can be universally applied to a variety of antibodies and peptide sequences. Adsorption of native and modified antibodies onto AuNPs is confirmed through UV-vis spectroscopy and dynamic light scattering. Additionally, an anti-horseradish peroxidase (anti-HRP) monoclonal antibody was modified with a biotin linker via mTG conjugation. This model system takes advantage of biotin to immobilize the antibody on a streptavidin coated surface and a colorimetric HRP assay to quantify antigen binding. Using streptavidin coated well plates and streptavidin functionalized AuNPs, we compare the immobilization, orientation, and antigen-binding capacity of random and mTG-mediated biotinylated antibodies. These results demonstrate the universality of mTG conjugation on different antibody host species using a variety of amine targets and can be easily expanded to other antibody systems and immobilization chemistries to control orientation.

GRAPH-BASED ANALYSIS OF CID SIMULATION DATA OF PROTONATED PEPTIDES: A CASE STUDY OF PROTONATED THREONINE AND PHOSPHO-THREONINE

Presenter(s): Boafo, Emmanuel, Graduate, Chemistry
Mentor: Dr. George L. Barnes
Authorship: Emmanuel Amoah Boafo, Trent A. Kobulnicky, George L. Barnes

Direct dynamics simulations of molecular systems yield atomic positions and velocities, which allow for mechanistic insight into the collision-induced dissociation (CID) of peptides in tandem mass spectrometry. However, the volume of data generated can present significant challenges for manual analysis. A graph- theory-based approach is introduced to automate the identification of dissociation mechanisms from an ensemble of direct dynamic simulation data. A modified adjacency matrix, termed an augmented adjacency matrix, is employed to incorporate chemical properties into the graph analysis. Application of this technique to protonated threonine and protonated phospho-threonine automatically revealed the most important dissociation pathways found in simulations and emphasize the changes in mechanism that take place upon phosphorylation. Significant peaks at m/z 102, 74, and 56 consistent with the experimentally observed peaks were elucidated, along with additional peaks at m/z 76, 58, and 45 for threonine-H^+. Notably, an $H4PO4^+$ ion (m/z 99) was captured as a major peak, attributed to a roaming mechanism. This indirect decomposition pathway involves internal reactivity within a short-lived ion-neutral complex. The finding highlights the significance of post-translational modifications in CID processes.

EXPLORING MUTAGENESIS AS A METHOD TO MODIFY HRP FOR ENHANCED ACTIVITY AND ADSORPTION TO GOLD NANOPARTICLES

Presenter(s): Breausche, Faith E., Graduate, Chemistry

Mentor: Jeremy Driskell

Authorship: Faith Breausche, Somerlot, Annelise, Jason Walder, Jon A. Friesen, and Jeremy D. Driskell

Gold nanoparticle (AuNPs) conjugation has been widely reported to advance bioanalytical methods and emerging biotechnologies. Various studies propose to alter conjugation through modification of the AuNP surface chemistry. Conversely, this research aims to investigate the effects of protein modification, specifically through the addition of sulfhydryl groups, on the immobilization to the AuNP surface. Previous research conducted in our lab, showed a greater loading capacity, improved robustness, and increased stability on AuNPs upon thiol installation to the model enzyme horseradish peroxidase (HRP). This, however, was observed by chemical alteration of the enzyme with Traut's reagent, which limited thiolation to lysine residues. Protein mutagenesis offers a more flexible and site- specific approach to further improve the conjugation between thiolated HRP (THRP) and citrate-capped AuNPs. The pET45b vector containing the HRP gene is expressed in Arctic Express *E. coli* cells for an increased yield of enzyme. The kinetics of HRP and HRP-AuNPs is quantified through analysis of its catalytic activity with the substrate 2,2'-azinobis [3-ethylbenzothiazoline-6-sulfonic acid]-diammonium salt (ABTS). Thorough analysis of kinetics can provide information regarding efficiency, stability, and robustness. Moreover, effects of thiolation via mutagenesis on the HRP gene can be compared to native and chemical modified [T]HRP. Mutagenesis allows for alteration of the HRP gene sequence to select amino acids to be exchanged for cysteine. The sulfhydryl groups on cysteine may drive or alter the aforementioned characteristics of the mutated HRP bioconjugate. Thus, comparison between the bioconjugates with chemically thiolated HRP and mutated HRP may generate an optimized HRP-AuNP bioconjugate. The outcome of this study may shed light on the benefits of protein-AuNP bioconjugate on biosensing, imaging, novel drug delivery systems, biomedical therapies, and immunoassays.

PREPARING FOR THE BASE-MEDIATED REARRANGEMENT REACTION

Presenter(s): Ervin, Quentin, Undergraduate, Chemistry

Mentor: Dr. Andy Mitchell

The purpose of these experiments was to synthesize various maltol-based compounds with different R- groups to analyze the Base-Mediated Rearrangement Reaction. Some of the R-groups that were chosen to be synthesized include: tert-butyl, PMB, methyl, primary, and tosyl. The reactions performed during the synthesis of the Base-Mediated Rearranged Product include Protection of Maltol, Bromination, Aminations with various amines, and Acylations with methyl malonyl chloride, all culminating in the Base-Mediated Rearrangement. Techniques used to monitor, purify, and characterize the compounds include Thin Layer Chromatography (TLC), Flash Column Chromatography, 1H and 13C NMR Spectroscopy, and Mass Spectrometry. These reactions provided practice for optimizing reactions and provided starting material that could be used for the Base-Mediated Rearrangement.

TOWARDS THE SYNTHESIS OF AN ANTIMALARIA AGENT VIA THE ASYMMETRIC GLYCOLATE ALDOL ADDITION REACTION AND A CONVERGENT TRANSAMIDATION STRATEGY

Presenter(s): Kimsey, Alexandria, Undergraduate, Chemistry
Affram, Kweku Amaning, Graduate, Chemistry

Mentor: Dr. Shawn R. Hitchcock

According to the Centers for Disease Control, Malaria is a disease of major significance that is primarily found in countries in sub-Saharan Africa, South America, Southeast Asia, and the Middle East. In 2023, The World Health Organization estimated that there were 263 million cases of malaria infection and that there was an 8% mortality rate. This translates to an estimated total of 597,000 fatalities around the world. There are numerous medicinal agents available in the fight against malaria, but these medicinal treatments often involve side effects or reduced efficacy. Therefore, there is an increasing need for effective medicinal agents for the treatment of malaria. A number of researchers have developed medicinal agents for this purpose and there is promise for the recent development of a potent vaccine. In this context, Ghosh and coworkers recently developed a series of novel antiplasmodial compounds that have shown much promise in terms of having positive pharmacokinetic properties. Other research groups are also working in the pursuit of such lifesaving drugs as well. We became interested in synthesizing an antimalaria compound employing our asymmetric glycolate aldol addition chemistry. This poster will summarize the efforts to have taken place thus far in terms of achieving the asymmetric synthesis of a potent antimalarial agent.

N–O TETHER-ENABLED NET INTERMOLECULAR [5+2] CYCLOADDITION: A PRELIMINARY STUDY

Presenter(s): Oluborode, Joseph, Graduate, Chemistry

Mentor: Dr. Andy Mitchell

Authorship: Joseph Oluborode, Andy Mitchell

Intermolecular cycloadditions provide an efficient route to complex three-dimensional (3D) structures; however, entropic factors often pose significant challenges in achieving high regio and stereoselectivity. An effective approach to overcoming this limitation involves the use of a temporary tether, which can be cleaved after the successful formation of the cycloadduct, thereby improving reaction efficiency and selectivity.

Hydroxylamine-based tethers allow favorable assembly of new cycloadducts, with the potential for controlled modification of the resulting alkoxyamine structure. This transformation can be efficiently achieved via N–O bond cleavage using zinc in acetic acid, as well as through alternative methods such as catalytic hydrogenation (H_2/Pd in methanol) and reduction with Raney nickel. Very recent initial data for this concept using a Boc-protected alkoxyamine afforded a promising initial result with a 68% yield of the cycloadduct. Additionally, alkoxyamines have been suggested as potential drug precursors for cancer therapy, demonstrating promising applications in brain tumor treatment due to their unique chemical reactivity and biological relevance.

COORDINATION OF BENZYL CONTAINING PHOSPHINE LIGANDS TO RUTHENIUM (II)

Presenter(s): Sloan, Mia, Undergraduate, Chemistry

Mentor: Dr. Lisa Szczepura

Authorship: Mia Sloan, Lisa Szczepura

During the summer of 2024 and the 2024-2025 academic year, research efforts have been focused on the synthesis and characterization of the two transition metal complexes $[Ru(bpy)_2(PBnPh_2)Cl](PF_6)$ and $[Ru(bpy)_2(PBn_3)Cl](PF_6)$. Similar complexes with different R groups on the phosphorous have been synthesized, but these specific complexes have not yet been synthesized and characterized. Procedures for $[Ru(bpy)_2(PBnPh_2)Cl](PF_6)$ have been completed and involved synthesis of the crude product, purification, and analysis using ^{1}H and ^{31}P NMR spectroscopy, elemental analysis, UV-VIS spectroscopy, and mass spectrometry. Metathesis with sodium tetrakis(3,5-bis(trifluoromethyl)phenyl) borate (NaBARF) was used to exchange the PF_6 counter anion with the BARF anion. Single crystal x-ray diffraction studies of $[Ru(bpy)_2(PBnPh_2)Cl](BARF)$ allowed us to determine the structure of this compound. Similar efforts are currently underway for $[Ru(bpy)_2(PBn_3)Cl](PF_6)$.

TEMPERATURE DEPENDENCE OF LISTERIA MONOCYTOGENES AND SULFOLOBUS ISLANDICUS GLYCEROL KINASE AND CHARACTERIZATION OF LISTERIA MONOCYTOGENES GLYCEROL KINASE

Presenter(s): Walis, Sara, Undergraduate, Chemistry

Mentor: Dr. Jon Friesen

Authorship: Sara Walis, Jon Friesen

Listeria monocytogenes is a bacterium that causes the food-borne illness listeriosis. This pathogenic bacterium survives in high salt and bile conditions, and in colder environments. *Sulfolobus islandicus* is another organism that exists in high salt conditions along with high temperature and low pH environments. This extremophilic archaea is utilized as a model system by many scientists to understand cellular processes. Comprehension of the molecular processes of bacteria and archaea could lead to further development of treatments of illnesses. Organisms such as *Listeria* and *Sulfolobus* have a lipid membrane that serves as structure for the cell and is a site for molecular transport and signaling. A class of lipids, known as glycerophospholipids contain glycerol 3-phosphate in their structure. The ATP dependent enzyme, glycerol kinase catalyzes glycerol to glycerol 3-phosphate.

The gene that encodes *Listeria monocytogenes* glycerol kinase (LmGK) and *Sulfolobus islandicus* glycerol kinase (SiGK) were isolated, and the recombinant proteins were expressed and purified. Activity as a function of temperature was measured on glycerol kinase from both organisms utilizing phosphorus-31 NMR. Comparing the two graphs yielded opposing results that corresponded to the natural environment of the organism. Circular dichroism (CD) was utilized to visually determine potential structural changes in glycerol kinase at various temperatures and determine Tm values. The CD data of glycerol kinase also corresponded to the natural environment of the organism.

LmGK was further kinetically characterized and the optimal, pH, divalent cation, dNTP, glycerol concentration, and magnesium concentration were determined. Future research includes discovering structural determinants for binding and enzymatic activity of LmGK and performing site-directed mutagenesis. Upon alteration, the mutated enzyme can be kinetically characterized to determine the effects of the mutated amino acid on the catalytic activity.

RAPID, DIRECT SCREENING OF OPIOIDS FROM UNWASHED POPPY SEEDS WITH 3D-PRINTED CONE SPRAY IONIZATION-MASS SPECTROMETRY (3D-PCSI-MS)

Presenter(s): Wiggins, Emily, Graduate, Chemistry

Mentor: Dr. Christopher Mulligan

Authorship: Emily Wiggins, Blaise Jones, Kinsley, Nwaiwu, Jamie R. Wieland, Christopher C. Mulligan

Papaver somniferum (poppy plant) is the origin of several natural products (e.g. poppy seeds, oils, opium, etc.) that have found widespread use in the modern world. The poppy seed, specifically, is a common ingredient that is used in food and drink, and while the seed itself does not possess appreciable opioid content, the latex exudate found in the seedpod contains high levels of opium alkaloids (e.g. morphine, noscapine, papaverine). Correspondingly, improperly washed poppy seeds can leave high level residues potentially yielding positive drug tests even from legal products. This work reports a rapid screening method for poppy seed quality assessment, allowing for improperly washed seeds to be semi-quantitatively discriminated via 3D-printed cone spray ionization-mass spectrometry (3D-PCSI-MS). Through the use of 3D-printed cones made from a conductive polymer filament, samples can be directly collected (either through direct filling or scooping of the sample) and analyzed via MS in their native state with minimal sample preparation. For quantitative studies, calibration curves were generated for target opioids utilizing a heroin standard reference material as an internal standard (IS). Linearity across the studies ranged from R^2 values of 0.9643 to 0.9999 and processed quality control standards produced accuracies sufficient for semi-quantitative screening of target opioids. The overall analysis time, including sampling, MS analysis, and data interpretation, is approximately 5 minutes per sample, showing the high-throughput capabilities of this technique. Future work of interest includes detection limits for target opioids, repeatability across various operator experience levels, and reliability via a blinded error rate study. Overall, this work demonstrates proof-of-principle for a novel, direct analysis method for effective quality control assessment of poppy seed consumer products.

THE ROLE OF INTERNAL PUBLIC RELATIONS IN FACILITATING EMPLOYEE ENGAGEMENT IN CSR: A CASE EXAMPLE OF DELOITTE'S EMPLOYEE VOLUNTEERISM INITIATIVES

Presenter(s): Anani, Janet Laadi, Graduate, Communication
Mentor: Dr. Pete Smudde
Authorship: Janet Laadi Anani

This paper explores how internal public relations (PR) helps organizations to engage employees in corporate social responsibility (CSR) initiatives, using Deloitte's volunteerism programs as a case example. Drawing on social exchange theory (SET) and Carroll's CSR pyramid, the study highlights how organizations can create meaningful, reciprocal relationships with employees by aligning CSR initiatives with personal and professional goals. Through qualitative content analysis of publicly available materials, the research identifies key themes of reciprocity, mutual benefits, and commitment, showcasing how Deloitte communicates the value of CSR participation to employees. The findings show that Deloitte emphasizes opportunities for skill development, recognition, and personal fulfillment, while strengthening its corporate image and advancing social impact goals. This study provides insights for internal PR professionals, demonstrating how well-planned CSR communication can build trust, enhance employee satisfaction, and foster long-term commitment. Limitations of the study and recommendations for future research are also discussed.

Keywords: corporate social responsibility, internal public relations, employee participation, social exchange theory

NAVIGATING LEADERSHIP TRANSITIONS: THE ROLE OF INTERNAL PUBLIC RELATIONS IN MICROSOFT'S 2014 CEO CHANGE

Presenter(s): Asare, Margaret Nana Yaa, Graduate, Communication
Mentor: Dr. Pete Smudde
Authorship: Margaret Nana Yaa Asare

Leadership transitions significantly impact an organization's stability, employee morale, and corporate culture, requiring effective internal public relations (iPR) strategies to ensure success. This study examines Microsoft's 2014 chief executive officer (CEO) transition from Steve Ballmer to Satya Nadella, analyzing the role of iPR through the lens of the change management model (CMM). Using qualitative content analysis of public statements, memos, and interview transcripts, the research explores iPR's contributions during the unfreezing, implementation, and refreezing stages of the transition. Findings emphasize the importance of transparent communication, two-way engagement, and consistent reinforcement of cultural values in reducing resistance and aligning employees with new leadership visions. The study also highlights the strategic use of secure internal digital platforms like Yammer to foster inclusivity and real-time interaction, which enhanced employee trust and collaboration. By integrating model frameworks with real-world application, the research advances understanding of iPR's role in managing organizational change and provides actionable insights for practitioners navigating leadership transitions. Future research should consider employee perspectives, cross- industry comparisons, and the influence of emerging technologies on internal communication during such pivotal moments.

Keywords: internal public relations, leadership transitions, organizational change, change management model, employee engagement, corporate culture

CULTURAL IDENTITY, MENTAL HEALTH STIGMA AND HELP SEEKING BEHAVIOURS AMONG AFRICAN INTERNATIONAL STUDENTS IN THE USA

Presenter(s): Asirifi, Mark Ofosu, Graduate, Communication

Mentor: Dr. John Baldwin

Authorship: Mark Ofosu Asirifi

African students in the United States face significant cultural adjustment challenges that impact their mental health and help-seeking behaviors. Research shows underutilization of university counseling services among this population despite high levels of psychological distress. The Communication Theory of Identity (CTI) provides a useful framework for understanding how cultural identity orientations and the acculturation process influence mental health stigma perceptions and barriers to accessing support. This paper seeks to discuss the challenges related to African students' cultural backgrounds, evolving identities during cross-cultural transitions, mental illness stigma attitudes, and intentions to seek professional psychological help. The paper analyzes variables including cultural identity, mental health stigma, language barriers and help-seeking self-efficacy, all derived from existing research, to provide empirical insights into the cultural and psychosocial factors underlying counseling service underutilization among African international students. This paper will provide applications for culturally competent outreach strategies to support this underserved group's wellbeing in institutions of higher education and university health services.

TO INFORM, OR *DIS*INFORM: THE HIDDEN AGENDA OF YOUR LOCAL MEDIA'S "WATCHDOG" AND HOW TO NOT FALL INTO THE DEPTHS OF DISINFORMATION

Presenter(s): Carrillo, Yasmin, Graduate, Communication
Mentor: Dr. Megan Hopper
Co-Mentor: Dr. Fernando Severino
Authorship: Yasmin Carrillo

Due to the decline in local journalism, smaller communities across Illinois do not receive the same access to information as other communities do. This then leads to an increase in political polarization, political corruption and the spread of misinformation and disinformation. Media literacy skills are crucial in order to identify and dissect the media individuals are exposed to both willingly and unwillingly. The Local Government Information Services (LGIS) labels itself as an independent form of journalism and considers itself a media watchdog. Since its first fake-local news recording in 2012, the super PAC funded organization has worked to publish stolen and AI altered stories to push a conservative agenda. With 36 digital websites and 11 newspapers, the LGIS targets small communities in Illinois to spread disinformation. Disinformation deliberately attempts to mislead and conceal information to disrupt, divide, confuse, or damage audiences' understanding or political cohesion. In a thematic analysis, following the Society of Professional Journalist code of ethics, several themes arise in the LGIS publications about the 2024 local elections in the state of Illinois. Themes include: lack of authorship, ethical justification, transparency and credibility, plagiarism, violation of privacy, just to name a few. These findings show stories published by the LGIS are not watchdog journalism, and with how stories are put together and published, a new skill set is developed to identify disinformation in the media, and how to not be easily deceived.

PARENT-CHILD COMMUNICATION ABOUT MONEY

Presenter(s): Delorto, Hannah, Graduate, Communication

Mentor: Dr. Lindsey Thomas

Parental communication plays a crucial role in a young person's development of financial knowledge and behaviors, such as budgeting, saving, investing, retirement preparation, consumer skills, and avoiding excessive debt. This research focuses on emerging young adults aged 18-25, who are a vulnerable group of spenders. Participants shared memorable messages they received about money and rated the messages for positive or negative affect. Then, they answered questions measuring their financial literacy, financial wellbeing, attitude about the importance of money. The findings of these correlations could help inform future financial education and support for emerging young adults. Future research should extend this and examine the impact of parent-child communication about money on one's interpersonal conversations with others, such as their spouses or siblings.

TRANS* STUDENT EXPERIENCES WITH PRONOUN DISCLOSURE IN THE HIGHER EDUCATION CLASSROOM

Presenter(s): Foltz, Ellanore, Graduate, Communication

Mentor: Dr. John Baldwin

Authorship: Ellanore Foltz

With a growing number of trans* students in the higher education classroom, educators are still grappling with how to best support their trans* students. Previous literature has utilized Communication Privacy Management (CPM) to analyze self-disclosures of private information. While transgendered pronouns occupy a unique middle ground between private and public information, trans* students utilize elements of CPM such as contextual and risk and and benefit criteria when deciding how to navigate pronoun disclose and continue to upkeep these disclosures through inevitable misgendering. Through in-depth interviews with six trans* college students, this study found that participants considered contextualized identity, risks and benefits, and navigating misgendering when disclosing pronouns in an academic context.

LOVE BEYOND COLOR: EXAMINING HOW THE 'BLACK WIFE EFFECT' TIKTOK TRENDS PERPETUATES POST-RACIAL IDEOLOGY

Presenter(s): Gyamfi, Emmanuella Ama, Graduate, Communication

Mentor: Dr. Stephen Rahko

Authorship: Emmanuella Ama Gyamfi

The study explores how the "Black Wife Effect" TikTok trend perpetuates post-racial ideology while seemingly celebrating interracial relationships and diversity. The trend features non-Black creators, mostly men, who show off how their personal transformation as result of dating Black women. By closing analyzing viral TikTok videos by Canadian creator, Kolter Bouchard, the study looks at how racial inequalities in digital spaces can be challenged and reinforced through social media trends. In particular, the study looks at how humor functions as a rhetorical strategy to address complex racial dynamics while making controversial topics more accessible to digital audiences.

The study identifies four main strategies used in these videos. First, creators use humor as a rhetorical tool to make racial commentary more appropriate, often using self-deprecating jokes and pop culture references. Second, they frame personal transformation as scientifically valid by combining comedy with pseudo-academic language. Third, they commodify the Black identity through metaphors of consumption and transaction, suggesting that Blackness can be acquired through proximity. Fourth, they appropriate Black cultural elements while acknowledging but not fully respecting cultural boundaries.

A key finding of the study indicates that these trends simultaneously celebrate and problematizes interracial relationships. While appearing to promote racial harmony and unity, the videos tend to reduce Black identity to a set of transferable attributes that can be learnt or acquired. This is indicative of broader patterns in social media where assertions of racial progress mask persistent inequalities. The study demonstrates how entertainment- focused content can facilitate discussions about race while reinforcing problematic assumptions about racial identity and transformation. Therefore, the study suggests that meaningful change in digital racial discourse requires moving beyond surface-level celebrations of diversity to address deeper patterns of racial hierarchy and commodification.

THE ROLE OF COMMUNICATION IN WOMEN'S HEALTH ISSUES: FACTORS INFLUENCING FEMALE INTERNATIONAL STUDENTS' HEALTH-SEEKING BEHAVIOR AND HEALTH DECISIONS

Presenter(s): Senu, Getrude, Graduate, Communication

Mentor: Dr. John Baldwin

Authorship: Getrude Senu

This study explores the role of communication in women's health issues among female international students, examining key factors influencing their healthcare experiences. Through qualitative research using open-ended questionnaires, the study investigates language barriers, cultural influences, gender dynamics, social support networks, and digital health technologies that impact health-seeking behaviors. The findings reveal significant challenges, including communication difficulties with healthcare providers, cultural differences in health perceptions, and systemic barriers to accessing care. These findings highlight the relationship between cultural background, communication strategies, and healthcare utilization. The study identifies critical areas for improvement, including the need for culturally sensitive healthcare approaches, language support services, and targeted interventions that address the unique needs of female international students. The research contributes to developing more inclusive healthcare communication strategies for this diverse population.

NAVIGATING EMOTIONAL UNCERTAINTY: A STUDY ON ANXIETY AND MENTAL HEALTH CHALLENGES OF INTERNATIONAL MARRIED STUDENTS LIVING APART FROM THEIR SPOUSES

Presenter(s): Turkson, Vera, Graduate, Communication

Mentor: Dr. John Baldwin

Long-distance marriage among international students during postgraduate studies presents significant emotional and mental health challenges to students during postgraduate studies yet remains an understudied phenomenon. This study investigates the lived experiences of six married international students (three females and three males) at Illinois State University, focusing on the emotional toll of separation, its impact on academic and social well-being, and their coping mechanisms for dealing with it. The findings highlight the importance of attachment figures for emotional stability, suggesting that the absence of a spouse creates an emotional void that can lead to heightened stress. The study calls for universities to develop culturally sensitive counselling services, peer support groups, and technological interventions to support married international students. By exploring the unique challenges faced by this group, the research contributes to the understanding of mental health in the context of global student mobility and provides practical recommendations for institutional support systems.

Keywords: coping mechanisms, university support systems, loneliness, digital communication

COMMUNICATION SCIENCES AND DISORDERS

ASSESSING THE AVAILABILITY OF MOBILE HEARING HEALTH SERVICES IN ILLINOIS: FINDINGS FROM A STATEWIDE PROVIDER SURVEY

Presenter(s): Canales, Allysa, Undergraduate, Communication Sciences & Disorders
Holthaus, Jayden, Undergraduate, Communication Sciences & Disorders
Ferzacca, Olivia, Undergraduate, Interdisciplinary Studies
Clay, Taylor, Graduate, Communication Sciences & Disorders
Whitcomb, Molly, Graduate, Communication Sciences & Disorders

Mentor: Dr. Antony Joseph

Authorship: Allysa Canales, Jayden Holthaus, Olivia Ferzacca, Taylor Clay, Molly Whitcomb, Antony Joseph

As hearing loss prevalence rises and audiologist shortages persist, access to mobile hearing health services is critical in ensuring equitable care. This study examines the availability of mobile hearing services in Illinois through a comprehensive phone survey of 656 hearing healthcare locations, including audiologists, hearing instrument specialists (HIS), and otolaryngologists (ENTs). A total of 91 locations reported offering mobile hearing services, staffed by 149 HIS, 96 audiologists, and 6 ENTs. The survey also analyzed provider distribution using key demographic and healthcare variables, including county population, age distribution, healthcare facility presence, and regional classification. Survey responses revealed disparities in service availability, highlighting gaps in mobile hearing healthcare coverage across Illinois.

A literature review of hearing healthcare workforce data identified significant discrepancies between reports from ASHA, the U.S. Bureau of Labor Statistics (BLS), and other databases, emphasizing the need for standardized reporting methods. The response rate for the survey was 63.1%, with challenges such as clinic closures (9%), uncooperative respondents (6.9%), and unreachable locations (17%). Findings suggest a growing demand for mobile hearing health services, yet inconsistencies in workforce data hinder accurate assessments of provider availability. This study underscores the need for improved data collection strategies to guide healthcare planning and address access disparities. Future research should explore patient accessibility to mobile services and develop solutions for expanding hearing healthcare to underserved regions.

HEARING HEALTH ACCESS IN ILLINOIS: PREDICTING PROVIDER AVAILABILITY THROUGH A STATEWIDE SURVEY

Presenter(s): Holthaus, Jayden, Undergraduate, Communication Sciences & Disorders
Canales, Allysa, Undergraduate, Communication Sciences & Disorders
Ferzacca, Olivia, Undergraduate, Interdisciplinary Studies
Clay, Taylor, Graduate, Communication Sciences & Disorders
Whitcomb, Molly, Graduate, Communication Sciences & Disorders

Mentor: Dr. Antony Joseph

Authorship: Jayden Holthaus, Allysa Canales, Olivia Ferzacca, Taylor Clay, Molly Whitcomb, Antony Joseph

Hearing loss affects over 21.7% of U.S. adults, yet access to hearing healthcare remains a challenge, particularly in rural areas. The shortage of audiologists, hearing instrument specialists (HIS), and otolaryngologists (ENTs) further limits timely patient care. This study used a statewide phone survey of 656 Illinois hearing healthcare locations to determine provider availability and estimate gaps in service coverage. Survey responses identified 445 HIS, 542 audiologists, and 391 ENTs actively practicing, with estimates adjusting those figures to 609 HIS, 742 audiologists, and 535 ENTs based on non-response rates. Additional analysis included population demographics, income levels, healthcare facility availability, and regional classification. Results indicate 66% of HIS practice without audiologists, potentially affecting service quality. Comparison with licensure data from the Illinois Department of Financial and Professional Regulation (IDFPR) suggests estimation errors as low as 6%, validating the survey's predictive accuracy.

Findings align with national trends, where hearing healthcare shortages disproportionately impact rural and lower-income communities. Literature review data confirm that 56.6% of U.S. counties lack an audiologist, leading to increased disparities in hearing health outcomes. The results highlight an urgent need for workforce expansion and strategic provider distribution to improve accessibility. Future research should focus on evaluating patient experiences in underserved areas and developing policy recommendations to address disparities in hearing healthcare access. This study provides a critical foundation for ongoing efforts to improve hearing healthcare services across Illinois and beyond.

EVALUATION OF THICKENED LIQUID PERCEPTION AND SUBMENTAL MUSCLE ACTIVITY IN NORMAL INDIVIDUALS

Presenter(s): Keating, Aleah, Undergraduate, Communication Sciences & Disorders

Mentor: Dr. Taeok Park

Authorship: Aleah Keating, Taeok Park

Purpose: Dietary modification such as using thickened liquid plays a significant and central role in dysphagia management, allowing those with impaired swallowing to safely improve their ease of oral intake and consumption of foods and liquids and decrease the risk of aspiration. Meanwhile, there was a lack of research on the thickened liquid. This project aims to identify and quantify perception, level of effort to swallow, and acceptance/acceptability levels on the different levels of liquid consistency through feedback from the normal population.

Methods: 35 participants aged 18-22 participated in this study. Participants consumed each liquid three times, including their own saliva, water, nectar-thick, honey-thick, and apple-flavored nectar-thick liquids before completing a survey. While consuming liquids, the participant's peak amplitude of submental muscle activity was measured by surface electromyography (sEMG). The survey responses were analyzed by descriptive analysis, and the peak amplitude of submental muscle activity was analyzed by one-way ANOVA ($p<.05$).

Results: Participants thought the nectar-thickened liquid (91%) and honey-thickened liquid (94%) would change the taste of the liquid compared to regular water. Participants also felt different textures in nectar-thickened liquid (88%), honey-thickened liquid (91%), and flavored-thickened liquid (74%). There is a higher level of satisfaction with the quality of flavored-thickened liquid (60%) than nectar-thickened liquid (11%) and honey-thickened liquid (8%). A higher percentage of participants thought swallowing nectar- thickened liquids (74%) and honey-thickened liquids (88%) required more effort than flavored-thickened liquids (45%). If participants in everyday life needed to drink a thickened liquid instead of regular water due to a swallowing problem, 69% of participants are likely to drink flavored-thickened liquid. The results of sEMG showed a significant difference between water and nectar-thickened liquid ($p=.04$). Nectar- thickened liquid required higher muscle activation than water.

Conclusion: Thickened liquids' texture and flavor influenced participants' perceptions and experiences. Despite the thicker consistency, participants reported greater satisfaction with flavored-thickened liquid quality than unflavored-thickened liquids. Many participants found swallowing the flavored nectar-thickened liquid easier than the unflavored nectar-thickened liquid; however, the submental muscle activation did not differ between the flavored and nonflavored thickened liquid. This suggests that perceptions and physical effort might differ when swallowing flavored and nonflavored thickened liquids. Regarding preference for daily consumption, participants would be more likely to drink flavored-thickened liquid than unflavored- thickened liquids if they had a swallowing problem. Overall, flavor and texture play crucial roles in the perceived acceptability of thickened liquids, with flavored options being more favorable than unflavored- thickened liquids.

CSD4ME: A STUDENT-LED INITIATIVE TO RECRUIT AND ENGAGE FUTURE COMMUNICATION SCIENCES AND DISORDERS PROFESSIONALS

Presenter(s): Larsen, Abigayle, Graduate, Communication Sciences & Disorders
Mentor: Dr. Antony Joseph
Co-Mentor: Dr. McLoddy Kadyamusuma
Authorship: Abigayle Larsen, Anthony Joseph, McLoddy Kadyamusuma

Recruiting students into Communication Sciences and Disorders (CSD) programs is essential for the field's continued growth. The *CSD4Me* Initiative, which was developed through the Academic Recruitment Program (ARP) at Illinois State University, aims to increase enrollment in undergraduate and graduate CSD programs through student-led outreach. Over 18 months, the program evolved through two phases: (1) Year 1 focused on establishing recruitment materials, developing marketing strategies, and training student presenters; (2) Year 2 expanded recruitment by creating the Ambassador Program, a structured initiative to train student representatives. Through 190 presentations at high schools and junior colleges across Illinois, 50 student ambassadors engaged with 3,180 prospective students, contributing to over 23,000 social media engagements.

Presenters were trained via an ambassador orientation and maintained ongoing communication through Microsoft Teams platform, email and shared Microsoft folder. Data tracking ensured the efficient distribution of marketing materials and captured audience engagement through QR code scans using Beaconstack. Our preliminary findings suggest that student-led recruitment fosters engagement, strengthens interest in CSD careers, and increases accessibility to information about audiology and speech-language pathology. Challenges included maintaining consistent participation and refining marketing strategies. Future directions involve assessing long-term recruitment trends, expanding virtual outreach and use of automation, and strengthening retention strategies. By empowering students as ambassadors, *CSD4Me* is a model for sustainable recruitment efforts in higher education.

RECRUITMENT OF COMMUNICATION SCIENCES AND DISORDERS STUDENTS: A QUALITATIVE ANALYSIS OF KEY FACTORS

Presenter(s): Larsen, Abigayle, Graduate, Communication Sciences & Disorders
Mentor: Dr. Antony Joseph
Co-Mentor: Dr. McLoddy Kadyamusuma
Authorship: Abigayle Larsen, Anthony Joseph, McLoddy Kadyamusuma

Recruiting students into Communication Sciences and Disorders (CSD) programs is essential for the field's continued growth. The *CSD4Me* Initiative, which was developed through the Academic Recruitment Program (ARP) at Illinois State University, aims to increase enrollment in undergraduate and graduate CSD programs through student-led outreach. Over 18 months, the program evolved through two phases: (1) Year 1 focused on establishing recruitment materials, developing marketing strategies, and training student presenters; (2) Year 2 expanded recruitment by creating the Ambassador Program, a structured initiative to train student representatives. Through 190 presentations at high schools and junior colleges across Illinois, 50 student ambassadors engaged with 3,180 prospective students, contributing to over 23,000 social media engagements. Presenters were trained via an ambassador orientation and maintained ongoing communication through Microsoft Teams platform, email and shared Microsoft folder. Data tracking ensured the efficient distribution of marketing materials and captured audience engagement through QR code scans using Beaconstack. Our preliminary findings suggest that student-led recruitment fosters engagement, strengthens interest in CSD careers, and increases accessibility to information about audiology and speech-language pathology. Challenges included maintaining consistent participation and refining marketing strategies. Future directions involve assessing long-term recruitment trends, expanding virtual outreach and use of automation, and strengthening retention strategies. By empowering students as ambassadors, CSD4Me is a model for sustainable recruitment efforts in higher education.

AUDIOLOGY STUDENTS' KNOWLEDGE OF COGNITION AND SELF-EFFICACY IN CONDUCTING COGNITIVE SCREENINGS

Presenter(s): Manoj, Mukta, Undergraduate, Communication Sciences & Disorders
Colula, Sophia, Undergraduate, Communication Sciences & Disorders
Hedge, Jenna, Graduate, Communication Sciences & Disorders
Welsh, Caitlyn, Graduate, Communication Sciences & Disorders
Cunningham, Derian, Graduate, Communication Sciences & Disorders

Mentor: Dr. Shraddha Shende

Hearing loss is a modifiable risk factor for dementia, making it essential for audiologists to be equipped with knowledge to identify cognitive decline in their patients. Although it is imperative that audiology students obtain foundational knowledge of cognition and appropriately administer cognitive screenings, many graduate programs often lack direct instruction on the topic. The aim of this study is to examine audiology students' self-perceived understanding of cognition and their self-efficacy in conducting cognitive screenings. This study included 22 graduate-level audiology students who participated in a four-week lecture series and responded to two in-house developed surveys, administered before and after the lecture series. Additionally, students were instructed to complete online training to administer the Montreal Cognitive Assessment (MoCA) to supplement learning. The results from the surveys are currently being analyzed. It is hypothesized that knowledge of cognition and self-efficacy in conducting cognitive screenings will improve post-lecture series.

CRIMINAL JUSTICE SCIENCES

PUBLIC PERCEPTION OF PAIRING ARTIFICIAL INTELLIGENCE WITH BODY-WORN CAMERAS

Presenter(s): Angelo, Braden, Graduate, Criminal Justice Sciences

Mentor: Dr. Jessie Krienert

Authorship: Braden Angelo

Background: Body-worn cameras (BWCs) are used in law enforcement to improve accountability, transparency, and trustworthiness. Recently, artificial intelligence (AI) has been paired with BWCs with the aim of increasing officer efficiency and accountability. AI has been used to analyze BWC footage and assess officer professionalism. Furthermore, this technology has also been used to create police reports from BWC footage. Although there is strong public support for BWC implementation. Less is known about the support for AI auditing of BWC footage. The current study examines public perception of pairing BWC footage with AI to audit or write reports.

Methods: An online survey was created, including Likert-scale questions and open- ended responses in order to measure the public's perception of the use of AI with BWCs. The survey was administered to Illinois State University students via email.

Results: Results showed mixed support for the use of AI to analyze BWC footage. This mixed support was due to concerns of privacy and accuracy. However, respondents noted the benefits of AI for efficiency.

Conclusion/Discussion: These results are important because they show that AI use in law enforcement may not increase public trust in law enforcement. Results may help law enforcement agencies and lawmakers create policies to address potential concerns with the use of AI with BWC footage. More research will be needed to better understand the public's thoughts on the use of AI in law enforcement, especially in regard to BWCs.

BEAUTIES BEHIND BARS: THE FEMALE SERIAL KILLER

Presenter(s): Cope, Chloe, Undergraduate, Criminal Justice Sciences

Mentor: Dr. Jeffrey Walsh

This project explores female serial killers throughout history across several areas of interest. The present work examines the historical development of female serial killers noting infamous and/or unique cases of female perpetrated serial homicide in a global sense. The project also examines legislation and laws pertaining to females committing multiple murders, and explores media portrayals of female serial killers, compared to male serial killers, throughout history. Artifacts including prior literature, newspapers, podcasts, fictional and nonfictional crime shows inform the present project addressing important aspects of often overlooked and under explored female serial murder.

Keywords: female, serial killers, media, history and global perspective, famous killers, law, crime

ARE WE JUST CHECKING A BOX? AN EXAMINATION OF PREA MESSAGING

Presenter(s): Donnelly, Caitlyn, Graduate, Psychology

Mentor: Dr. Jessie Krienert

Co-Mentor: Dr. Jeffrey Walsh

Authorship: Caitlyn Donnelly

The Prison Rape Elimination Act (PREA) was signed into law in 2003 to aid the prevention of sexual assault and harassment in prison through a zero-tolerance approach. While all states have addressed PREA in some measure, the extent of required and necessary information within handbooks has not been monitored or enforced. To effectively communicate necessary information to inmates, three criteria must be met: findability, readability, and informative content. A qualitative examination of PREA content in inmate handbooks from 49/50 states was conducted using MAXQDA. Coding emphasized the 40 standards recommended by the National Prison Rape Elimination Committee (NPREC) across four main areas (Prevention and Response Planning, Prevention, Detection and Response, and Monitoring). Results indicate significant gaps/omissions in critical content areas. Recommendations for best practice in PREA messaging related to content are provided.

PARENTS OF SEX OFFENDERS: UNRAVELLING DISENFRANCHISED GRIEF

Presenter(s): Zornow, Morgan, Graduate, Criminal Justice Sciences

Mentor: Dr. Donna Selman

Parents of convicted sex offenders face a unique form of stigma, due to their association with their child that has been convicted of a sex crime, consisting of disenfranchised grief and social isolation that is often overlooked. While current research focuses on victims and offenders, examination of the parent's emotional and social consequences are often ignored. This study examines how parents of sex offenders navigate social stigma, cope with disenfranchised grief, and manage interpersonal relationships. Utilizing online survey responses of 154 self identified parents of convicted sex offenders, we have found respondents experience disenfranchised grief and social isolation, revealed through experiences with law enforcement, due process, familial relationships, and social isolation. Specifically, findings include increased stigma by association, leading to social exclusion, internalized shame, societal judgement that invalidates their experiences, and powerlessness. For example, parents reported deteriorating interpersonal relationships after disclosure, but found positive connections within support groups with other parents facing similar stigma. Despite these challenges, findings indicate that strong social support systems can mitigate stigma and indirectly foster resilience and feelings of empathy mitigate their disenfranchised grief. This study highlights the need for increased awareness to address the unintended harm faced by families of sex offenders.

CHARACTER DESIGN AND SET DESIGN

Presenter(s): Kuo, Yu Chen, Graduate, Creative Technologies

Mentor: Dr. Kristin Carlson

Authorship: Yu Chen Kuo

Character design and set design are parts of the process of doing animation in industry. Design process has a lot of things to think about.

Character design isn't just drawing good anatomy or illustration. We use a character to tell the story. Let the audience get the emotion and personality from the character. Different personalities will also make different appearances to increase the recognition between characters. Character designers are part of the animation team. Have to work with directors, animators, modeling artists and riggers. So we need to consider a lot of things to make a balance including how this character acts,what expressions the character has, even more, how to save budgets from the beginning, that is character design. Drawing a character can tell the most of the story!

Set design isn't just drawing a room or any prop in the room. It's WORLD BUILDING. To build a world all makes sense to the story. To figure out with story artists what kind of the world the characters are living in and what are they doing in that area. Using the set that means environment and props for storytelling. Take a room for example. Ideal set design can tell who is using this room, what is this room for, where is this room taking place in the story. Just think about your room right now. Maybe there is a messy sheet on the bed, a lot of cloth on the chair, books scattered on the table, posters on the wall. And you are the character, and because your role and personality makes the room like this. Clearly, You are the one using this room. That’s the set design we want to have!

Keeping thinking and trying is the job of character and set designers doing art. Let’s make a persuasive design to bring the imaginary world believable to convey a meaningful story!

BOUNTY HUNTER MUTT: AN ARCADE GAME

Presenter(s): Mellon, Aidan, Graduate, Creative Technologies

Mentor: Dr. Kristin Carlson

Authorship: Mellon Aidan

This will be an on-rails shooter style arcade game where the player moves on a track and occasionally stops to shoot at waves of enemies. The visual style depicts retro-style sprites in a 3D environment, featuring a cartoony aesthetic and bright colors. Through fighting a variety of enemies players will compete for high scores on a leaderboard, similar to the arcade games of the past. The game will be short but sweet, promoting players to try again and again to keep improving.

STIMULATING FOCUS AND CALMNESS USING SOFT FABRICATION: A USER-CENTERED APPROACH

Presenter(s): Oku, Emmanuella, Graduate, Creative Technologies

Mentor: Dr. Kristin Carlson

Co-Mentors: Dr Greg, Corness, Dr. Annie Sungkajun

This study explores the potential of active attention objects embedded with technologies such as LEDs to enhance focus and calmness in individuals with inattentive ADHD, particularly in classroom settings. Individuals with inattentive ADHD often struggle with irritability, stress, and panic attacks when exposed to external stimuli such as loud sounds, varying light intensities, strong smells, or physical sensations, which significantly hinders their ability to concentrate and remain composed. My literature review discovered a connection between an individual's blinking pattern and their focus, and my work explores how to design active attention objects to engage with blinking as a focus tactic.

The research utilized two participatory design methods: focus groups and prototyping. Conducted in two phases, the study first paired participants in groups of three, allowing them to sketch designs for active attention objects, highlighting where technologies such as blinking LEDs should be placed. Participants discussed their concepts collaboratively. In the second phase, participants constructed physical prototypes of their designs and used potentiometers to control the speed and patterns of the LEDs. Each group produced individual prototypes, with the LEDs intended to regulate participants' blinking patterns. This was crucial, as individuals with inattentive ADHD either forget to blink when focusing or blink excessively when overwhelmed by external stimuli. The LEDs aimed to capture attention, stimulate blinking, and suggest appropriate blinking speeds.

The study was effective as it empowered participants with agency in their care and unveiled unique patterns, processes, and associations pertinent to each participant's experience. My findings indicate that active attention objects such as LEDs blinking in specific patterns can significantly improve focus and calmness in individuals with inattentive ADHD by promoting regulated blinking.

ANKARA IN MOTION

Presenter(s): Olutomiwa, Fikayo, Graduate, Creative Technologies
Mentor: Prof. Annie Sungkajun
Co-Mentor: Dr. Kristin Carlson

Nigeria is home to a rich diversity of cultural fabrics worn by its many ethnic groups. Among these, Ankara, also known as African wax print, is the most widely used. This vibrant textile, characterized by bold patterns and colors, is a staple in clothing across West and Central Africa and serves as a classic representation of Nigerian culture and society. It is deeply embedded in Nigerian life, from media to arts and fashion.

Ankara in Motion is a multimedia installation that reimagines these fabrics through motion design, projection mapping and augmented reality (AR). It blends digital animation with physical textiles and portraiture to create an immersive visual experience. Inspired by artists Tonia Nneji and Yinka Shonibare, who are of Nigerian descent and prominently feature cultural fabrics in their works, this project explores the intersection of fashion, technology, and cultural storytelling through an Afrofuturist lens.

The installation consists of digitally painted portraits and plain fabrics brought to life with animated Ankara patterns. The patterns, drawn from traditional Ankara designs, are digitally recreated and animated into dynamic displays. The portraits depict subjects wearing ankara patterns that transition into animated sequences when viewed from an AR-enabled device to create an interactive visual experience that highlights the diversity of both the people and the patterns. Then through projection mapping, these animations are cast onto physical textiles.

By centralizing African narratives, Ankara in Motion encourages African stories to be told by Africans, who can offer the depth and cultural nuance often missed by Western media when representing Africa's diverse countries and cultures. This research examines how motion design can transform traditional fabric into an evolving visual medium, encouraging new perspectives on the preservation and reinterpretation of African aesthetics. Through this fusion of digital media and textile art, Ankara in Motion seeks to bridge the gap between tradition and modernity, engaging audiences in a reimagined experience of African fashion and identity.

Looking ahead, Ankara in Motion aims to expand its technological and interactive elements to create an even more immersive experience. Future iterations will incorporate camera tracking to project animated patterns directly onto viewers, allowing them to become part of the installation. Additionally, motion tracking will allow the animations to evolve in response to audience movements, creating a dynamic interaction between the viewer and the digital Ankara patterns. These advancements will transform Ankara in Motion into a living, responsive art piece that redefines African textiles in contemporary media.

ENHANCING SPATIAL AWARNESS FOR PEOPLE WHO ARE BLIND OR LOW VISION

Presenter(s): Qasrawi, Loiy, Graduate, Creative Technologies

Mentor: Dr. Kristin Carlson

Authorship: Loiy Qasrawi

Blind and low vison (BLV) people may have a harder time in understanding their surroundings, as they primarily rely on other senses such as touching or hearing or other traditional aid like white canes and guide dogs which may be difficult in unfamiliar spaces due to inaccessibility, or lack of experience. As the technology advanced, BLV people started to rely on several artificial intelligence (AI) systems to describe their surroundings trying to fill their spatial awareness gap. However, these AI systems still cannot describe the environment in a proper way to give the user a feeling of their surroundings. The goal of this thesis is to investigate the usefulness of adding an additional layer of human annotated description to the generated text from large-language models (LLMs) and vision-language models (VLMs).

SENSEWAY

Presenter(s): Qasrawi, Loiy, Graduate, Creative Technologies

Mentor: Dr. Kristin Carlson

Authorship: Loiy Qasrawi, Zeteny Nagy, Greg Corness

SenseWay is a navigation system designed to assist blind and low vision (BLV) people navigating through unfamiliar spaces. Integrating the advanced toolkits and plugins available in Apple Vision Pro and Unity, SenseWay explores approaches for the treatment of specific spatial navigation issues by BLV people. The system's key functions include real-time object detection, real-time object classification, and voice feedback. The paper describes the design environment, architecture, and key features focusing on criteria such as reliability, accuracy, and user interaction. The system requires testing and validation to obtain thorough data and insight into the effectiveness of the device.

ECONOMICS

GENDER AND COUNTRY DIFFERENCES IN INITIAL JOB PLACEMENTS FOR ECONOMICS PH.D.'S: NEW EVIDENCE FROM RECENT COHORTS

Presenter(s): Camargo, Jesus, Undergraduate, Applied Economics

Mentor: Dr. Susan Chen

I collect data on the Ph.D. economist job market between 2017 and 2019 to investigate initial job placement outcomes. The sample includes 1,822 new economist Ph.D.s from 57 top U.S. economics programs. The preliminary analysis shows that there is gender gap in securing initial job placements or finding a tenure-track (TT) appointment in the sample, an important departure from the previous literature. As expected, candidates from higher-ranked doctoral programs increase the likelihood of a TT appointment. Similarly, having publications as a graduate student help land a TT position, but being a native speaker does not. In addition, female international students are more likely to stay in the U.S. after they graduate than their male counterparts, so are those who attended a U.S. undergraduate institution. Compared to lower-ranked programs, international students in elite programs are more likely to remain in the U.S. Finally, students who are originally from China, Korea, and Japan are more likely to return upon graduation than those from other regions. My findings add to the literature in two aspects: First, compared to existing studies, my sample consists of all job market candidates from a wide range of programs over multiple years and allows me to conduct an analysis more immune to selection bias. Second, with the increasing presence of international and female students in the U.S. doctoral programs, I re- examine initial job placements for Ph.D. economists from a new perspective.

Keywords: Gender differences; Ph.D. labor market; Job type; Job location JEL Codes: A11, A23, J44

ASSESSING THE ENVIRONMENTAL AND ECONOMIC EFFECTS OF MARKET LIBERALIZATION IN US ELECTRICITY GENERATION

Presenter(s): Unalan, Alper, Graduate, Economics

Mentor: Dr. Susan Chen

This study evaluates the impact of introduction of market mechanisms to electricity generation costs and carbon emissions in United States. Differences-in-difference methodology is used to estimate the causal impact of market liberalization in electricity markets, where a staggered transition took place. To evaluate the costs of using out-of-merit facilities, hourly electricity generation data from 1992 to 2012 is used. I find that markets reduce production costs by reallocating production and carbon emissions also decreased in facilities that adopted market mechanisms.

ENGLISH

ANALYZING THE ROLE OF CONTINGENCY IN CLASSROOM INTERACTIONS: A DISCOURSE ANALYTIC PERSPECTIVE

Presenter(s): Hossain, Md. Didar, Graduate, English

Mentor: Dr. Kristina Lewis

Authorship: Md Didar Hossain, Kristina Lewis

This qualitative study analyzed classroom interactions to examine the contingencies in teacher-student interactions. Within interaction, contingency refers to the dependency of an utterance on what was said before and on the consideration of what might be said afterward. This dependency of utterances is, in many ways, unpredictable. In general, this topic matters because by investigating the unpredictable classroom interactions, teachers can have an improved understanding of what students need. So, they can then bring required improvements or changes to their teaching approaches. In my study, I analyzed interactions within an undergraduate composition course that I taught to understand how participants in classroom discussions (myself and my students) use multifarious verbal and non-verbal cues to make meaning, how these exchanges are contingent upon each other, and how these either facilitate or problematize classroom interactions.

My data include 16 hours of classroom recording collected over four months. Informed consent was provided by 16 student participants. I transcribed and analyzed the recorded data using discourse analysis conventions (Rymes, 2016). I drew on Lee's (2017) study demonstrating that classroom interactions are contingent upon each other. While Lee only examined the teacher's third turn (responding to student answers to teacher questions), I took a different approach by looking at how each turn is contingent upon other turns, both within and beyond specific sequences.

My analysis reveals that participants use both verbal and non-verbal cues to negotiate meaning. I show how non-verbal cues can work to signal the next speaker to take a turn. I also examine how silence does not always mean that students do not know the answer, so they should be given time to think. This study suggests that silence and non-verbal communication forms should be curated as resources for teaching, and teachers should have patience to allow students time to think and share their ideas. I also learned and suggest that teachers can record, transcribe, and analyze interactions within their own classrooms, which can help them become reflective practitioners (Kumaravadivelu, 2003) and improve their teaching to support both equity and desired learning outcomes. Understanding the contingencies of classroom interactions will, overall, help teachers develop their sense of responsiveness in teaching.

EVALUATING THE EFFECTIVENESS OF STRATEGIES FOR REDUCING FOOD WASTE IN UNIVERSITY DINING HALLS

Presenter(s): Chaudhari, Rutvik, Graduate, Family and Consumer Sciences

Mentor: Dr. Erol Sozen

Food waste is a major issue in university dining halls, which is leading to financial loss and environmental harm (Leal Filho et al., 2023). Globally, almost 1.3 billion tons of consumable food are wasted annually, making food waste a critical challenge (Roy et al., 2023). This issue is particularly significant in all-you-care-to-eat (AYCTE) dining settings, where the absence of portion control can contribute to excessive food waste (Ellison et al., 2019; Freedman & Brochado, 2010). To address this problem, effective strategies such as trayless dining, portion control, and waste tracking systems are implemented to encourage mindful consumption and reduce excess food waste (Vizzoto et al., 2021; Zhang & Kwon, 2022). The study aims to investigate the effectiveness of these methods by utilizing a mixed-methods approach, including qualitative data from staff interviews and quantitative insights from student surveys. By analyzing the results, the study seeks to provide universities with practical, cost-effective, and sustainable recommendations to minimize food waste and promote environmental sustainability.

SUPPORTING SIBLING RELATIONSHIPS AMONG YOUTH AND YOUNG ADULTS WITH CHRONIC CONDITIONS

Presenters: Sulak, Meg, Undergraduate, Family and Consumer Sciences
Castillo, Halie, Graduate, Family and Consumer Sciences
Smith, Sierra, Graduate, Family and Consumer Sciences
Estes, Destiny, Undergraduate, Agriculture

Mentor: Dr. Luke Russell

Authorship: Luke Russell, Meg Sulak, Halie Castillo, Sierra Smith, Destiny Estes

An estimated 20.8% of U.S. children have a special health care need (SHCN) that requires ongoing treatment via medication, counseling services, therapeutic supports, or assistance navigating functional limitations (Child and Adolescent Health Measurement Initiative, 2022). Such diagnoses often cause stress and demand change from diagnosed individuals, but also from close family members, including siblings (Hayden & Hastings, 2022). Well siblings, unfortunately, are sometimes excluded or neglected when parents quite reasonably seek to respond to crises of new (or ongoing) health challenges in one of their children (Hanvey et al., 2022). Though diagnoses can introduce distance and difficulty, there is also evidence that siblings can often be critical confidants, supports, and resources in the context of chronic illness (Avieli et al., 2019; Havey et al., 2022; Fullerton et al., 2016) This project seeks to examine what differentiates such experiences among siblings, and identify strategies for creating supportive, close, or beneficial sibling relationships in the context of chronic illness, whether mental, developmental, and/or physical. We are specifically examining how special healthcare needs can hold consequences for sibling relationships from childhood through emerging adulthood and uncover ways family members and health professionals can support positive sibling relationships within these contexts.

Overall, our primary research questions are: How do siblings navigate and experience chronic conditions during childhood through emerging adulthood? And how can siblings, caregivers, or other adults facilitate the creation or maintenance of supportive, close, or beneficial sibling relationships in the context of chronic conditions?

FASHION LAW: A COMPARISON OF 1800s APPAREL LAWS FROM THE UNITED STATES AND ENGLAND

Presenter(s): Tellez, Chantal, Graduate, Family and Consumer Sciences
Mentor: Dr. Jennifer Banning
Authorship: Chantal Tellez, Jennifer Banning

Dress has been found in laws and regulations as far back as Ancient Greece and Rome. A great example of this is sumptuary laws, which promote placement within society and establish a sense of social hierarchy by restricting people from wearing certain colors, clothing, and quality of clothing. The severity of those restrictions relied on several factors such as annual income, social status, gender, and job position. While these laws have been established in countries that had a stable presence in power, one can wonder how a new form of government or power can welcome and determine laws that regulate dress. This is why the focus of this study is to compare laws and regulations on women's dress in the 1800s between the United States and England. The reason for this research is due to the limited research found and by learning about both countries, we can compare laws in dress between governments and the stability of the country.

This research is a historical analysis of scholarly sources. The data found had to be women's apparel laws, regulations, or any form of sumptuary laws from the 1800s to 1900s. The data was then categorized into two groups, dress, and fabrics, with a minimum of one regulation in each group for both the United States and England. The research revealed that the United States had 3 dress laws that were in effect during the 1800s, such as the Cross-Dress Law from 1863-1974, Tignon Law from 1780-1803, and the Negro Act from
1735-1865. As for England, regulations for women's dress were found before the 19th century and instead,
societal expectations were used as regulations of dress. Two laws from the United States were for both sexes and one for solely women. While in England women only had societal expectations due to England ending sumptuary laws in 1604.

These findings are important because they set the differences between both countries for their regulations of dress during that time. By reviewing the differences, we can determine that England learned that restricting dress is not beneficial due to its history, while the United States would later come to realize that there are no benefits to restricting dress.

AN ANALYSIS OF INTELLECTUAL PROPERTY FASHION CASES

Presenter(s): Tellez, Chantal, Graduate, Family and Consumer Sciences
Mentor: Dr. Yoon Jin Ma
Authorship: Chantal Tellez, Yoon Jin Ma

The creation of unique and creative works such as inventions, artwork, and music is recognized as Intellectual property (IP). Many creatives seek legal protection for their IP through copyrights, patents, trade secrets, and trademarks. For instance, well-known brands like Nike have successfully trademarked their slogans, such as “Just Do It.” While it is common to protect creative works, protecting IP within the fashion industry has become a gray area. One of the main reasons for this is the varying resources available to designers for IP protection.

Unlike other industries, fashion brands and designers do not rely on a single type of legal protection; instead, their needs vary by work. While authors benefit from copyright laws, fashion designers face limitations because only particular elements of a garment or silhouette can be protected. For example, in a 2013 lawsuit, the iconic red sole trademark of Christian Louboutin was contested when Yves Saint Laurent released a red monochromatic high heel. Christian Louboutin lost this case because their trademark was restricted to protecting the sole of the shoe only when the outer part contrasts with it. This ruling, along with many others, raises questions about the legal boundaries of IP in the fashion industry. According to the US Patent and Trademark Office, the value of seized counterfeit and pirated items in the United States exceeded $3.3 billion in 2021.

This study aims to identify legal trends, including common types of IP infringement and the products involved in IP cases within apparel companies. To achieve this, a content analysis will be conducted using the Westlaw legal database, focusing on 50 recent federal cases. Each case will be analyzed based on its ruling, the product in question, and the type of infringement identified. The findings will shed light on the current issues and limitations surrounding legal protections for IP in the fashion industry.

MODELING THE IMPACT OF PROJECTED CHANGE ON GROUNDWATER DEMAND IN THE MAHOMET AQUIFER

Presenter(s): Abugu, Christabel, Graduate, Geography, Geology, and the Environment

Mentor: Dr. Wondwosen Seyoum

Authorship: Christabel Abugu

The Mahomet Aquifer serves as a vital water source for approximately 14 counties in east-central Illinois, supporting municipal, agricultural, and industrial needs. With projected changes in climate, population growth, and increasing water demand, assessing the long-term sustainability of this aquifer is crucial. Elevated pumping rates to meet rising water needs may lead to declining groundwater levels and increased risks of contaminant transport. Understanding these interactions is essential for effective groundwater management. This study seeks to address two key research questions: (1) How will projected changes in groundwater demand affect water levels in the Mahomet aquifer? (2) How do groundwater withdrawal rates impact contaminant transport within the aquifer? The research objectives are to (1) develop and calibrate a numerical groundwater flow model using historical water demand and groundwater level data, (2) simulate projected groundwater conditions under various demand scenarios based on Shared Socioeconomic Pathway-based Forcing Scenarios (SSP-RCPs), (3) analyze trends in groundwater level variations due to projected changes in demand, and (4) employ a particle tracking model to evaluate the effects of groundwater withdrawals on contaminant transport pathways. To achieve these objectives, a three-dimensional numerical groundwater model will be developed using MODFLOW to evaluate the Mahomet Aquifer's response to projected water demand and climate change. Particle tracking will be employed using MODPATH to assess the migration pathways of contaminants under varying pumping conditions. The model will incorporate key hydrogeological parameters such as recharge rates, aquifer layer properties, and boundary conditions to simulate groundwater flow dynamics and contaminant transport in both confined and unconfined sections of the aquifer. Model calibration and validation will be performed using historical groundwater level data before running scenario-based simulations to assess future groundwater sustainability. It is expected that under high-demand scenarios, significant water level declines will lead to increased stress on the aquifer. Additionally, as groundwater levels drop, contaminant migration is anticipated to intensify, particularly in areas with high withdrawal rates. These findings will provide critical insights into balancing groundwater extraction while mitigating contamination risks. By integrating hydrological modeling with climate and socioeconomic projections, this study will aid in developing adaptive management strategies to ensure the continued reliability and quality of the Mahomet Aquifer as a long-term water source for east-central Illinois.

INVESTIGATING HETEROGENEITY OF HYDRAULIC CONDUCTIVITY AND ITS INFLUENCE ON GROUNDWATER FLOW DYNAMICS WITHIN A SATURATED RIPARIAN BUFFER IN CENTRAL ILLINOIS

Presenter(s): Awuku, Joseph, Graduate, Geography, Geology, and the Environment

Mentor: Dr. Eric Peterson

Co-Mentor: Dr. Wondwosen Seyoum

Authorship: Joseph Awuku, Eric Peterson, Wondwosen Seyoum, Lisa Tranel

The use of Saturated Riparian Buffers (SRBs) in agricultural settings as a means of reducing contamination of surface water and groundwater resources has gained popularity due to their trapping ability and solute removal (nutrient recycling) capacity. Considering SRB's nutrient-trapping and removal ability, numerous studies have been conducted to characterize the effectiveness of SRBs. However, most studies on SRBs have paid minimal attention to how heterogeneity of hydraulic conductivity (K) contributes to the effectiveness of SRBs. The heterogeneity of K has been proven to be, if not the most significant, one of the contributing factors to the effectiveness of SRBs since heterogeneity in K controls water fluxes and solute trapping efficiency. This study investigates the heterogeneity in horizontal K and estimates the vertical groundwater-specific discharge ($q_{v)}$ between the upper weathered and its underlying unweathered glacial units of an SRB, adjacent to a tile-drained agricultural farm field in central Illinois. The glacial deposits at the study area are of the Tiskilwa Formation and are distinguished into an upper weathered clay, which becomes coarser and poorly sorted with depth, and an underlying unweathered diamicton. The diamicton comprises a clay-dominated matrix with coarser sediment, resulting in a poorly sorted unit. For 23 wells, geometric mean K values were calculated after reducing multiple slug test data using the Hvorslev (1951) method. From the data analysis, mean K values from individual wells ranged from 1.92×10^{-4} m/s to 7.63×10^{-6} m/s within the weathered diamicton, whereas the unweathered diamicton had K values as low as 4.79×10^{-9} m/s. Typical hydraulic gradients (i_z) values ranged from 0.03 to 0.1 from one-time measurements. q_v was computed as the product of the average vertical hydraulic conductivity (K_V) and vertical hydraulic gradients (i_z) between depths of 1.5m and 4.6m, as these depths represent locations in the weathered and unweathered diamicton, respectively. The results of the study confirm the conceptual model for shallow and intermediate groundwater flow where the study area experiences downwelling further away from the buffer zone with groundwater upwelling areas within the buffer zone. The q_v ranged from 1.25×10^{-7} m/s to 4.30×10^{-10} m/s, where areas with high K had higher q_v, suggesting higher dilution of nitrate, which is confirmed by past studies from the study site. In conclusion, the study area exhibits heterogeneity depicted by the variation of K over orders of magnitude and accounts for the dynamic flow of water within the SRB.

Keywords: Hydraulic Conductivity, Heterogeneity, Groundwater, Specific discharge, Upwelling, Downwelling

APPLICATION OF FLOATING WETLANDS TO IMPROVE URBAN STREAM QUALITY

Presenter(s): Chukwudi, Daniel, Graduate, Geography, Geology, and the Environment

Mentor: Dr. Eric Peterson

Authorship: Daniel Chukwudi, Eric Peterson

Increasing impervious surface associated with urbanization leads to degradation of a stream draining the area. Urban stream syndrome is the series of ecological changes, including high nutrient concentration, that negatively impact urban streams. The abundance of nutrients can lead to algae growth and eutrophication, deteriorating the ecological health of waterbodies and aquatic ecosystem. To address nutrient pollution, floating wetlands have emerged as an in-situ phytoremediation of stream ecosystems. Floating wetlands are constructed with buoyant substrate that allow plants to grow hydroponically. Along with the uptake of nutrients by plants, microbial biofilms formed on the roots of these plants absorb nutrients, improving water quality. Limited studies have been done on floating wetlands performance in urban streams. Using a 90m^2 floating wetland system located on a side canal on the north branch of the Chicago River, we aim to answer the following questions: 1) Do the floating wetland lower concentrations of nitrate as nitrogen ([NO_3-N]) and of phosphate ([PO_4^{3-}]) in the river? and 2) Are there differences in the effectiveness of floating wetlands in lowering nutrient concentration during growing season (April-September) where plant activity is at its peak, as compared to dormant season (October to March), where plant activity is minimal or cease? Between April 29th, 2018, and December 16th, 2023, water samples were collected upstream and downstream of the wetland and analyzed for [NO_3-N] and [PO_4^{3-}] using ion chromatography. From analysis, the mean [NO_3-N] upstream (5.8 mg/L) and downstream (4.6 mg/L) and [PO_4^{3-}] upstream (3.9 mg/L) and downstream (3.3 mg/L) show that the floating wetland lowered the overall [NO_3-N] and [PO_4^{3-}] by 20% and 15%, respectively over the entire sampling period. Decrease in nutrient concentration occurred during both the growing and dormant season. The mean [NO_3-N] concentration upstream and downstream for the growing season was (5 mg/L) and (3.9 mg/L); and (7 mg/L) and (5.5 mg/L) for the dormant season. While the mean [PO_4^{3-}] concentration upstream and downstream for the growing season was (3 mg/L) and (2.5 mg/L); and (5.1 mg/L) and (4.3 mg/L) for the dormant season. The floating wetland demonstrates potential for improving water quality in urban streams impacted by urbanization despite its small coverage area.

EXPLORING NITRATE REDUCTION IN A SATURATED RIPARIAN BUFFER THROUGH A THREE-DIMENSIONAL REACTIVE CONTAMINANT TRANSPORT MODEL: IMPLICATIONS FOR DESIGNING BETTER RIPARIAN BUFFERS

Presenter(s): Ijigade, Franklin, Graduate, Geography, Geology, and the Environment

Mentor: Dr. Wondwosen M. Seyoum

Authorship: Franklin Ijigade, Wondwosen M. Seyoum, Eric W. Peterson

Sub-surface tile drainage is predominantly used in Midwest agricultural farmlands to improve soil aeration and crop yields. However, it also leads to nutrient export from fields contaminating streams that drain into the Mississippi River and contributing to a hypoxic zone in the Gulf of Mexico, posing a major environmental concern. Saturated Riparian Buffers (SRB) are promising management practices. Studies show their effectiveness in reducing nitrate within glacial till formations, but the knowledge gaps persist. Specifically, the influence of heterogeneities on tile water discharge to stream needs to be better understood. These variations significantly impact nitrate transport and reduction within the SRB. This study aims to develop a coupled flow-reactive transport model to assess the impact of nitrate loads from sub-surface tile on stream health. A 3-D Steady-State numerical model has been developed incorporating data from 17 wells and 3 cone penetration test logs to simulate groundwater level in the SRB using the MODFLOW-USG code within Groundwater modeling system (GMS). The model contains a 0.5m x 0.5m grid size and two layers including the organic-rich topsoil and clays with increasing gradation of sand to gravel. The model was calibrated with water level from March 2024 and Validated with water level from February 2023. Result of the calibrated model with an RMSE of 0.33 reproduced field observation conditions while validation suggests that the model is capable to predict future water level conditions within the SRB. after calibration. The horizontal hydraulic conductivities range between 2.4m/day to 16.8m/day confirming heterogeneity within the till formation. Calibrated recharge and river conductance for the till formation were 0.000866m/day and 100m2/day respectively. sensitivity analysis indicates that recharge is the most sensitive parameter thus impacting flow path within the SRB. Furthermore, water level was simulated for transient conditions between March 2021 to June 2021 to capture period of tile flow, result show that flow is three-dimensional around the tile and one dimensional in the rest of the SRB therefore allowing more contact time with the organic topsoil supporting dilution and chemical reaction aiding nitrate reduction. To gain deeper insights into nitrate transformation and reduction, a reactive transport model will be developed by integrating transient tile flow conditions using the Block-Centered Transport (BCT) package within MODFLOW-USG Transport to simulate nitrate fate under the influence of heterogeneity in SRB. Results will provide insight into the effectiveness of SRB thus improving nitrate remediation through an optimized design and ultimately benefiting stream health.

UNDERSTANDING PHOSPHORUS LOAD TRENDS AND CONTROLLING FACTORS IN ILLINOIS WATERSHEDS

Presenter(s): Lartey, Hannah, Graduate, Geography, Geology, and the Environment

Mentor: Dr. Wondwosen Seyoum

In recent years, phosphorus concentration in watersheds in Illinois has been a major concern, where studies have shown an increasing trend in streams and rivers in Illinois. Phosphorus affects water quality and negatively impacts humans and the aquatic ecosystem. Results from the 2023 Illinois Nutrient Loss Reduction Strategy biennial report showed that phosphorus concentrations in Illinois waterways increased in 2021 and 2022 compared to historical baseline data and the Illinois River basin is a major contributor of P load to the Gulf of America. Excessive P in waterbodies leads to nutrient enrichment and eutrophication and causes algal bloom, and this disrupts water quality. Living organisms in water grow rapidly, they turn to die and decompose. Decomposition can deplete oxygen in water and result in hypoxia and fish kills. It is important to understand the factors influencing P load in Illinois watersheds that eventually flow into the Gulf of America. Various measures are being put in place to reduce and control the conditions of the hypoxic zones in the Gulf of America.

This project investigates phosphorous trends and factors (e.g., watershed characteristics (e.g., area, perimeter), climate factors (precipitation, temperature), hydrology (discharge), human factors (e.g., point sources), landuse, and soil) influencing phosphorus load trend in Illinois river basin. We will use historical water quality data to analyze the trend and determine the factors influencing the trend. Non-parametric Mann-Kendal and Sen's slope methods will be used to determine the trends in phosphorous data. A database constituting the factors will be created for each watershed, and a comparative analysis will be conducted to assess the controlling factors. A positive increase in trend is expected in areas showing high precipitation, runoff from urban areas, and agriculture dominated areas. Understanding the analysis from this study can help devise a strategy to control the increase of phosphorus in Illinois watersheds.

PROCESSING DRONE IMAGES USING DEEP LEARNING AI

Presenter(s): Newsom, Jaylon, Undergraduate, Geography, Geology, and the Environment

Mentor: Dr. Jonathan Thayn

For years, the National Parks Service and other land resource management agencies have tried to minimize the spread of the invasive tamarisk willow, but it has proven quite resilient. One attempt was the release of the Asian Tamarisk Beetle in 2006, in hopes that herbivory would reduce tamarisk coverage, freeing over a million acres of prime river-front habitat back to native species. Monitoring the resultant tamarisk die-back has been challenging since the tamarisk stands too small to be reliably detectable via satellite imagery. However, low-altitude drone imagery proved effective, but the high volume of images makes traditional processing prohibitive. Over a week in 2022, Professor Thayn and 2 ISU students collected 1,899 drone images over treated and untreated Tamarisk Willows along the Colorado River, east of Arches National Park. In this research project, we assess the effectiveness of a machine learning algorithm trained to classify live and dead tamarisk, with the goal of streamlining image processing and allowing larger areas along affected rivers to be routinely monitored.

SULFATE SOURCES IN GROUNDWATER FROM AN AGRICULTURAL AREA CENTRAL ILLINOIS

Presenter(s): Obi, Christabel Ifechukwu, Graduate, Geography, Geology and the Environment

Mentor: Dr. Eric Peterson

Increasing sulfate ($SO4^{2-}$) concentrations in the water environment, corresponding with increases in urbanization and industrialization, are a rising global concern. In excess of 250 mg/L, sulfate threatens human health and ecosystems. Elevated concentrations influence carbonate rock weathering, which contributes to the evolution of the global carbon cycle. Knowledge of sulfate sources, whether natural or anthropogenic, is essential for understanding sulfate transport and fate in groundwater. This study investigates $SO4^{2-}$ origin and transport in groundwater in an area dominated by agricultural land use in Mclean County, Illinois. Specifically, we explored these questions: 1) Do sulfate concentrations change with groundwater depth? And 2) Are there seasonal differences in sulfate concentrations in groundwater? Water samples collected over 9 years (2015-2024) from 37 observation wells were analyzed for major anions, including $SO4^{2-}$. Based on depths, wells screened at 4.6m (A) and 3.1m (B) were categorized as deep groundwater, while wells screened at 2.3m (C) and 1.5m (D) were categorized as shallow groundwater. Seasons were subdivided into spring/planting (April - June), summer/growing (July - September), fall/harvest (October - December), and winter/fallow (January - March), corresponding with agricultural practices. A cumulative probability plot and a one-way ANOVA revealed two $SO4^{2-}$ populations, with deep groundwater being statistically different from shallow groundwater, indicating depth-related changes in $SO4^{2-}$. A two-way ANOVA showed no seasonal differences in $SO4^{2-}$ concentrations. Depth differences in $SO4^{2-}$ are due to geogenic rock-water interactions releasing more sulfate in deeper groundwater wells. In contrast, shallow groundwater wells have lower sulfate levels, influenced by infiltration and recharge. Groundwater flow dynamics also contribute, with deeper groundwater having longer residence time, allowing more rock-water interactions compared to shallow groundwater. The lack of seasonal variation in SO_4^{2-} concentrations suggest sulfate levels are unaffected by seasonal changes like precipitation, agricultural runoff, or temperature fluctuations. The lack of seasonal variation suggests a stable groundwater system, potentially minimizing the immediate impact of seasonal surficial activities on sulfate levels.

Keywords: ANOVA, Sulfate, SRB, Cumulative probability plot, Groundwater

ASSESSING THE IMPACT OF CHLORIDE CONCENTRATION ON NITRATE LOSS IN SEDIMENT USING COLUMN STUDIES

Presenter(s): Suleiman, Zainab Onozasi, Graduate, Geography, Geology, and the Environment

Mentor: Dr. Eric Peterson

Co-Mentor: Dr. Lisa Tranel

Authorship: Zainab Onozasi Suleiman, Eric Peterson, Lisa Tranel, Jonathan Thayn

The widespread use of nitrogen-based fertilizers in agricultural fields has led to a significant increase in nitrate concentrations in soil and water, posing a significant threat to human health and aquatic ecosystems. Additionally, freshwater systems are increasingly experiencing salinization due to several factors, including the use of road de-icing salts, agricultural runoff and industrial discharges, which compound water quality challenges. These environmental concerns raise interest in understanding the factors influencing nitrate loss processes. One factor is the concentration of chloride. Chloride levels as low as 100-200 mg/L are believed to inhibit nitrate loss. This study focuses on understanding the impact of chloride on nitrate loss within sediment using column studies. Solutions with 15 mg/L nitrate as nitrogen (NO3-N) with added concentrations of chloride (Cl-), 0 mg/L (control), 50 mg/L, 100 mg/L, and 1000 mg/L were run through sediment columns to assess the role chloride concentration has on the rate of nitrate loss. The results showed that at chloride concentration of 0 mg/L, nitrate concentrations began to decrease at 21 hours, reaching a low of 0.59 mg/L at 50 hours, indicating significant nitrate loss. However, two trials conducted at chloride concentrations of 100 mg/L and 1000 mg/L showed no nitrate loss within the sediment over 192 hours experiment. Nitrate concentration remained almost constant at 15 mg/L suggesting that high chloride concentrations completely inhibit nitrate reduction processes within the sediment, further supporting my hypothesis that higher chloride levels inhibit nitrate loss. These findings highlight the importance of chloride contamination in freshwater systems, as elevated chloride levels can impede nitrate loss processes, potentially increasing water quality challenges such as eutrophication and posing long-term risks to human health and aquatic ecosystems. Reducing chloride inputs into water systems may enhance nitrate removal and improve water quality management efforts.

FIGHTING FOR THE FOREST: CONNECTING STRUGGLES AGAINST ENVIRONMENTAL INJUSTICE AND POLICE BRUTALITY IN ATLANTA

Presenter(s): Sullivan, Laine, Undergraduate, Geography, Geology, and the Environment

Mentor: Dr. Alec Foster

This project examines the intersection of environmental justice and systemic inequity through the lens of the South River Forest (Weelaunee) in Atlanta, Georgia, and the Atlanta Public Safety Training Center's controversial development, often called "Cop City" by activists. I sought to highlight the environmental and social implications of the training center by considering the impacts the deforestation of the Weelaunee Forest will have on the broader DeKalb County community and legal actions taken against the facility. Further, I will discuss how the degradation of the South River Forest reflects broader patterns of environmental racism and systemic disinvestment in marginalized communities. This research also contextualizes the historical inequities that shaped Atlanta's spatial and racial geographies, highlighting the legacies of segregation and redlining that have manifested in present-day uneven urban development. By analyzing resistance movements against "Cop City," I sought to illuminate the role of community mobilization and broader networks of solidarity in challenging state violence and advocating for environmental preservation.

HIGH-RESOLUTION MAPPING OF SOIL MOISTURE VARIATION IN A SATURATED RIPARIAN BUFFER(SRB) USING MACHINE LEARNING, UAS THERMAL AND MULTISPECTRAL IMAGERY

Presenter(s): Timah, Jackline, Graduate, Geography, Geology, and the Environment

Mentor: Dr. Wondwosen Seyoum

Authorship: Jackline Timah

Soil moisture plays a crucial role in nutrient cycling, plant health, and water quality, particularly within saturated riparian buffers (SRBs). SRBs are vegetated zones designed to reduce nutrient runoff from agricultural fields, improving water quality. This study employs Unmanned Aerial Systems (UAS) and machine learning to generate high-resolution soil moisture maps within SRBs, aiming to better understand how soil moisture variability influences nutrient cycling processes and hydrological dynamics. Using the T-3 site in CentralIllinois as the study area, this research will analyze the spatial distribution of soil moisture and the factors contributing to its variability, including vegetation, topography, and weather conditions.

Traditional soil moisture monitoring methods, such as in-situ sensors and satellite imagery, face limitations in spatial resolution, coverage, and operational efficiency. To overcome these challenges, this study integrates UAS-mounted thermal and multispectral sensors to collect high-resolution imagery. These datasets will be processed through machine learning algorithms to produce accurate and reliable soil moisture estimates.

The key research objectives include mapping soil moisture variation at the T-3 site, identifying the primary drivers of this variability, and bridging the methodological gaps between traditional and modern monitoring approaches. The findings aim to optimize SRB management practices for improved nutrient retention and water quality outcomes while advancing the application of UAS-based remote sensing for environmental monitoring.

This study will test the following hypotheses:

- Soil moisture is expected to be highest in the early morning due to dew accumulation, resulting in a lower radiometric thermal signature compared to the afternoon when surface moisture decreases due to evaporation.
- A strong positive correlation is expected between vegetation indices (NDVI, EVI, red-edge band) and soil moisture, while an inverse relationship is anticipated between thermal imagery and soil moisture content, as drier soils exhibit higher surface temperatures.

Ultimately, this research seeks to answer the central question: What is the variation of soil moisture within the saturated buffer zone at the T-3 site, and what factors account for this variability? The outcomes will contribute to improved environmental monitoring techniques, enhance precision agriculture strategies, and inform land management policies for sustainable water quality improvement.

BLOOMINGTON-NORMAL COMMUNITY AIR QUALITY RESEARCH AND EDUCATION (BN- CARE)

Presenter(s): Gorsage, Abbie, Undergraduate, Health Sciences

Mentor: Dr. Liangcheng Yang

Co-Mentor: Dr. Alicia Wodika

There is a gap in air quality monitoring in the Bloomington-Normal area. Through the Ecology Action Center (EAC), a community air quality monitoring program to promote environmental equity for environmental justice areas in Bloomington-Normal was created to close this gap. These environmental justice areas are determined by the U.S. Environmental Protection Agency (EPA). Three stationary air quality monitors were installed in these areas to measure PM 2.5, ozone, NO2 and VOCs. Data will be collected and shared with the community through a website and app sharing real-time local air quality. Data will be collected for three years with the goal of reducing exposure to unhealthy air pollution and collaborating with local businesses and agencies to discuss emission control strategies to improve the air quality in Bloomington-Normal.

CONVERTING COVER CROP BIOMASS TO VOLATILE FATTY ACIDS

Presenter(s): Lubna, Tuba Yasmin, Graduate, Agriculture
Mentor: Dr. Liangcheng Yang
Co-Mentor: Dr. Rob Rhykerd

Authorship: Tuba Yasmin Lubna, MD Mahadi Hasan, Caden Miller, Nicholas Heller, Rob Rhykerd, Liangcheng Yang

Cover crop biomass can be utilized for volatile fatty production which can be transformed into biofuel, sustainable aviation fuel, bioproducts and ecofriendly bioplastics. This study harvested eight winter cover crops, including wild pennycress, golden pennycress, covercress^{TM}, annual rye, cereal rye, pea, and clover biomass at three development stages which are 90% flowering stage (first harvest), 80-90% seed fill stage (second harvest) and maturity stage (third harvest). These cover crop biomass were used in arrested anaerobic digestion (AAD) to produce volatile fatty acids. Acetic, butyric, propionic, hexanoic, and valeric acid concentration and yield were analyzed using gas chromatograph. The objectives of this study were to (1) characterize the selected winter cover crop biomass at three growth stages, (2) evaluate the VFAs yields based on harvest dates, and (3) evaluate the potential revenue from the winter cover crops. Results showed that among all the cover crops used in this study for AAD to produce VFAs, annual rye showed a steady increase in yield over the harvests. In contrast, wild pennycress, golden pennycress, covercress^{TM}, and pea showed a steady decrease in yield over the harvest stages, while cereal rye, hybrid rye, and clover fluctuated across the first, second, and third harvests. Pea had the highest average VFAs concentrations of 10,961 ppm and VFAs yields of 0.304 g/g-VS in the first harvest. Results showed that these cover crops can generate potential revenue ranging from $100 - $800 per acre. Overall, the results indicate that these selected cover crop biomass are suitable for VFAs production.

COLLEGE STUDENTS' SENSE OF BELONGING ON CAMPUS PREDICTS GPA

Presenter(s): Nlombo, Divine, Graduate, Health Sciences

Mentor: Dr. John Matkovic

Authorship: Divine Nlombo, Kelly S. Clemens, John Matkovic

Higher education is an important pathway to career advancement and economic stability in the United States. However, there are many challenges that students can face when attending college. For example, college student phone use can have negative repercussions on student academic success and mental health. This purpose of this present study was to examine college student smartphone use, and identify what relationships, exist between phone use, academic performance, and students' sense of belonging on campus.

Participants (N=600,M) were recruited from the survey platform Prolific. Participants were recruited if they were 18-25, owned a smartphone, and resided in the US, to represent undergraduate students. Participants answered survey questions about their phone use, phone perceptions, anxiety, academic performance, and their sense of
belonging on campus.

Participants reported using their phone an average of more than six hours daily, with some students using their phones more than 12 hours. Participants' sense of belonging in college predicted their GPA: B = .08, t = 36.11, p = .01, F(1, 592)=6.74, R2 =.01. In addition, mediational analyses were conducted to explore whether Sense of Belonging predicted GPA due to anxiety. Thus, Anxiety was found to mediate the relationship between Sense of Belonging and GPA. This project investigates phosphorous trends and factors (e.g., watershed characteristics (e.g., area, perimeter), climate factors (precipitation, temperature), hydrology (discharge), human factors (e.g., point sources), landuse, and soil) influencing phosphorus load trend in Illinois river basin. We will use historical water quality data to analyze the trend and determine the factors influencing the trend. Non-parametric Mann-Kendal and Sen's slope methods will be used to determine the trends in phosphorous data. A database constituting the factors will be created for each watershed, and a comparative analysis will be conducted to assess the controlling factors. A positive increase in trend is expected in areas showing high precipitation, runoff from urban areas, and agriculture dominated areas. Understanding the analysis from this study can help devise a strategy to control the increase of phosphorus in Illinois watersheds.

The present study highlights the importance of students' sense of belonging, and their mental health, as it relates to their academic success. This study identifies possible avenues for addressing student success via health communication interventions. The present study also emphasizes the importance of anxiety, and its role in academic success.

ENGLISH LANGUAGE LEARNERS' SUCCESS ON THE REGISTERED HEALTH INFORMATION TECHNICIAN/ADMINISTRATOR EXAMS

Presenter(s): Ogurek, Bella, Graduate, Health Sciences

Mentor: Dr. Jennifer Peterson

Authorship: Bella Ogurek, Jennifer Peterson, Sandra Brightwell

English Language Learners (ELL) often face challenges in academics due to language barriers. These challenges can also affect their success on standardized certification examinations. Most organizations that oversee credentialing or certification examinations do not translate their exams, making them particularly challenging for ELL graduates. For new graduates in the health information field, obtaining the Registered Health Information Technician (RHIT) or Registered Health Information Administrator (RHIA) certification is crucial to their success. However, past literature has found that English Language Learners have low pass rates on these certification examinations. While there is some literature regarding challenges English Language Learners face on standardized certification examinations, there is very little literature regarding these issues for the RHIT and RHIA examinations. This research aims to determine the specific challenges ELL graduates experience with the RHIT or RHIA exam.

This study collected both qualitative and quantitative data through a survey sent via email to graduates of the RHIA program of Illinois State University and the RHIT program of Central Arizona College. In this study, time was found to be a major contributor to ELL graduate success on the RHIT and RHIA examinations. Over half of respondents felt time affected their ability to do their best on the exam and all respondents that did not complete the exam in the time allotted felt that time affected their ability to complete the exam. Findings reiterate a need for different testing and studying techniques to better suit the needs of the ELL student population.

COLLEGE STUDENT PERCEPTIONS OF VACCINE SAFETY

Presenter(s): Riley, Jasmine, Undergraduate, Health Sciences
Drew, Emily, Undergraduate, Biological Sciences
Reynolds, Delaney, Undergraduate, Biological Sciences

Mentor: Dr. Alicia Wodika

Co-Mentor: Dr. Jacqueline Lanier

Vaccines are one of the greatest public health achievements yet remain one of the most controversial topics in today's society. One of the major factors contributing to the controversy is varying perceptions on the safety of vaccines and the different factors that may contribute to one's perception of safety. The purpose of this study was to gain an understanding on how college students perceived the safety of vaccines. The study set out to answer three research questions: "What factors impact the attitude of college students toward the safety of vaccines?," "How do college students seek information about vaccines?," and "How do perceptions of vaccine safety among college students differ by vaccine?" After obtaining IRB approval, a Qualtrics survey was developed and sent to all ISU students in fall 2024. The survey contained questions regarding their personal safety perceptions regarding the COVID-19 Vaccine, the Human Papillomavirus (HPV) Vaccine, the Influenza (Flu) Vaccine, the Tetanus, Diphtheria and Pertussis (Tdap) Vaccine, and the Meningitis Vaccine. From completed surveys (n=433), quantitative data was analyzed using IBM SPSS to explore demographic trends among the safety perceptions. Qualitative data was analyzed using a content analysis and forming of themes. Interviews of self-selected survey participants were also conducted via Zoom, to gain further insight on concerns around vaccines, vaccine safety & trust, and the influence of vaccines on the community. Participants perceived the COVID-19 Vaccine as being the least safe followed by the Human Papillomavirus (HPV) Vaccine then the Influenza (Flu) Virus. Students perceived the Tetanus, Diphtheria, and Pertussis (Tdap) Vaccine and the Meningitis Vaccine as being the safest among the vaccines surveyed. Students also communicated that 'a doctor or healthcare provider suggesting a vaccine' and '10+ years of research on a vaccine' were the factors that increased their trust in the safety of a vaccine the most. Students also mentioned that a vaccine is perceived to be most safe when 'multiple studies have been conducted' and 'it has been verified by the Center for Disease Control and Prevention (CDC)'. When surveyed on where they seek information about vaccines, students communicated that they most often receive information via medical offices/ health care facilities and Public Health Campaigns.

CARTHUSIAN BREVIARY

Presenter(s): Chamness, Belle, Undergraduate, English

Mentor: Dr. Kathryn Jasper

When Special Collections acquired an original, fourteenth-century Carthusian Breviary, we knew very little about its historical and cultural context. Today, the Breviary remains to us. Why it was commissioned? How were its contents organized and formatted? Since 2018, students involved in the ISU Paleography Illuminated Project have transcribed dozens of pages with dense Latin texts full of abbreviations, but we have yet to understand the decisions behind their arrangement. Some pages include a liturgical calendar with a list of saints and their feast days, which has never been studied. My project examines this calendar to uncover the rationale behind the monastery's unique religious rituals.

THE BLUE AND THE GREY ON THE SILVER SCREEN: THE CIVIL WAR AND NATIONAL RECONCILIATION IN AMERICAN CINEMA, 1910-1915

Presenter(s): Kirchner, Wade, Graduate, History

Mentor: Dr. Amy Wood

My master's thesis examines film depictions of the American Civil War from 1910 to 1915, an era known more broadly as the Golden Jubilee, which commemorated the fiftieth anniversary of the war. The Golden Jubilee saw a rapid rise of this genre, as around three hundred films about the Civil War were released in just those five years, all before the 1915 release of *Birth of a Nation*, the most monumental film about Civil War memory. My thesis studies the cultural themes in these films and public response to them in order to understand why so many were made in such a short period of time.

This thesis is primarily concerned with the field of Civil War memory. The field itself arose in the mid-twentieth century as historians were attempting to reconcile the continued disenfranchisement of African-Americans with the abolition of slavery at the end of the Civil War. Broadly speaking, scholars of Civil War memory contend that a period of national reconciliation occurred at the end of the war, a cultural and political push which led to a lenient restoration of the Union and a maintaining of the status quo in the post-war South. All of this had been done at the expense of African-Americans. An important feature of the field is that this message of national reconciliation was pushed primarily though popular culture of the late nineteenth and early twentieth centuries, and so scholars in the field tend to be focused on studying these popular culture artifacts.

However, few scholars have paid attention to film and Civil War memory in the Golden Jubilee era. This thesis fills the gap in the historiography. Through analyzing a sample of films, and examining reports and advertisements on these films in trade papers and newspapers nationwide, this thesis studies the broad tropes that appear across popular cultural remembrances of the Civil War, related to the main themes of gender, race, and national reconciliation. I also study public reaction to these films, through the trade papers and newspapers, as a means to understand how these films performed the work of national reconciliation in American culture during the early twentieth century.

LATE MEDIEVAL SPANISH QUEENSHIP: WOMEN'S POLITICAL POWER IN PREMODERN EUROPE

Presenter(s): LeClere, Abby, Undergraduate, History

Mentors: Dr. Kathryn Jasper and Dr. Adam Franklin-Lyons

Authorship: Abby LeClere

There is the misconception that women could not access political power until recent history; however, women wielded significant influence while occupying powerful leadership positions as shown by the queens of the late medieval/early modern Spanish kingdoms. The political power these women exercised is demonstrated through letter correspondence, financial records, and data. While women in Iberian history traditionally have been given little attention by historians, new scholarship has created a new image for these queens, revealing the extent to which these women operated in the political scene.

TRANSPARENCY OF AI-BASED ANDROID HEALTHCARE APP PRIVACY POLICIES

Presenter(s): Dhamers, Jasmine, Undergraduate, Information Technology

Mentor: Dr. Yousra Javed

Authorship: Jasmine Dhamers, Laney Dunker, Yousra Javed

AI is incorporated into many mobile healthcare applications to streamline collecting, storing, and sharing data. However, AI usage in Android healthcare applications raises concerns regarding the availability, readability, transparency, and scope of their privacy policies. In this content analysis, we plan to compile a dataset of AI-based Android healthcare applications and extract their privacy policy document URLs using SerpApi's Google Play Store API. We will acquire the dataset of Android healthcare applications privacy policy's by targeting Android applications that focus on AI health, by using the "Health & Medical" and "Fitness" categories of the Google Play App store, and querying the applications that matched the search terms "ai", and ["health" or "fitness" or "medical"]. We will then use Python's Beautiful Soup package to extract the plaintext of each privacy policy. If no privacy policy is found for a certain app or the app's description returns an invalid URL, we will utilize the Google Search API provided by SerpApi to further look for an application's privacy policy. Then, we will calculate each privacy policy's readability and length using the Python Natural Language Toolkit library. Additionally, we will apply keyword matching techniques to analyze the scope and content transparency of the privacy policies. We will then provide results on the availability, readability, transparency, and scope of our dataset of Android healthcare applications.

VIVA: VIRTUALLY INVICIBLE VOICE ASSISTANT

Presenter(s): Gostu, Manideep Guptha, Graduate, Information Technology
Patel, Krupa Hirenkumar, Graduate, Information Technology
Kante, Chaitantya, Graduate, Information Technology
Koritala, Mounika Navarathnam, Graduate, Information Technology

Mentor: Dr. Will Lewis

Recovering from trauma is never easy and straightforward. Mourning the loss of a loved one, parent, friend, or close friend is sure to result in severe mental distress, such as sorrow, worry, and loneliness. Most of the individuals who grieve express the symptoms of grief, loneliness, and being unable to move on from the loss, and most typically they feel that their bereavement goes unnoticed to other individuals. Several individuals can acquire Prolonged Grief Disorder (PGD), a mental disorder with persistent states of grief on a behavioral, affective, and cognitive level that substantially impair normal functioning.

More conventional coping strategies such as counseling and therapy have been widely used but are not easily accessible, not affordable, or even not adequate enough for bereavement. Hence, most of them resort to advice, comfort, and counsel to deal with loss beyond conventional counseling.

To meet this need, we introduce VIVA (Virtually Invicible Voice Assistant), an artificial intelligence cognitive computing system that provides emotional support throughout the grieving process. Unlike standard voice assistants, VIVA employs cutting-edge natural language processing, sentiment analysis, and voice personalization in a responsive way to provide empathetic interaction. Through guided reflection, productive conversation, and soothing feedback, VIVA gives users a directed but non-judgmental space in which to manage their emotions.

VIVA is a new model of AI-based mental health therapy that provides an affordable and responsive care system for individuals experiencing bereavement. Combining the AI-based emotional intelligence and virtual communication, the current study proposes the capability of technology to empower the traditional mental health therapies to provide a personalized and empathetic experience to the individuals who are experiencing loss.

COMPUTATIONAL MODEL TO STUDY PHOTOSENSITIVE SEIZURES

Presenter(s): Jaswal, Twinkle, Undergraduate, Information Technology

Mentor: Dr. Rosangela Follmann

Co-mentor: Dr. Epaminondas Rosa

Authorship: Twinkle Jaswal

Neurons are the fundamental building blocks of the nervous system. Computational modeling of neurons can provide a powerful tool to study neurological processes, including neurological disorders. Epilepsy, for example, is a nervous system disorder characterized by excessive brain activity, which includes abnormal neuronal synchronization. It affects around 50 million people worldwide and can have devastating disruptions in their lives. Despite advancements in diagnosis and treatment, no definitive cure exists. Computer simulation studies using quantitative neuron network models can help the understanding of brain functions under neuropathological conditions. The outcome may be useful not only in the development of detection but also, in the prevention of seizures. In this work, we focus on understanding the role of external stimuli in influencing neural synchronization and seizure onset. Using the Huber-Braun neuron model based on the Hodgkin-Huxley equations, we simulate a network of coupled neurons to analyze how action potentials are triggered and synchronized under different conditions. Specifically, we introduce flickering light as a stimulus to the model and examine how it interacts with temperature changes. Our results show how external triggers like light can interact to cause abnormal brain activity, giving us a clearer picture of how to better understand and manage stimulus driven seizures.

PREDICTIVE POLICING AND AI BIAS: CAN MACHINE LEARNING MODELS BE MADE FAIR?

Presenter(s): Nguyen, Han, Undergraduate, Information Technology
Mentor: Dr. Abdelmounaam Rezgui
Authorship: Han Nguyen, Abdelmounaam Rezgui

Artificial intelligence is increasingly used in law enforcement, with predictive policing models claiming to enhance crime prevention. However, these systems often inherit and amplify biases from historical data, disproportionately impacting marginalized communities. This research examines whether machine learning algorithms can be trained to mitigate bias while preserving predictive accuracy. Using real-world crime datasets, we develop a PyTorch-based predictive policing model, applying fairness-aware training techniques such as adversarial debiasing, reweighting, and bias-regularized loss functions and measure their impact.

By systematically evaluating these techniques, we aim to quantify the trade-offs between fairness and model performance, assessing whether reducing bias inherently leads to diminished predictive power or if optimized architectures can maintain accuracy. The study involves extensive experimentation, including hyperparameter tuning and ablation studies, to determine the most effective configurations for bias mitigation. Additionally, we analyze model outputs using fairness metrics such as disparate impact, equalized odds, and demographic parity to understand the extent of bias reduction. Our findings will contribute to the technical discourse on fairness in AI, providing insights into the feasibility of deploying bias-mitigated predictive models in real-world law enforcement applications.

CONSTRUCTION OF A SIMULATED CUBESAT FOR SPACE IT EDUCATION

Presenter(s): Timm, Michael, Undergraduate, Information Technology
Flores, Peter, Undergraduate, Technology
Harrison, Dino, Undergraduate, Information Technology
Eagleton, Trevor, Undergraduate, Information Technology

Mentor: Prof. Daniel Freburg

Co-Mentor: Dr. Will Lewis

Since the Soviet Union launched the first artificial satellite Sputnik 1 on October 4, 1957, satellites have offered valuable insight to space and our planet. As of the end of 2024, there are just over 9,100 satellites orbiting the planet, with the majority of these satellites existing in low- earth orbit (LEO). Here exist most of the satellites known as CubeSats - scaled-down, low-cost versions of larger LEO satellites – that are less resource demanding, and more accessible to education institutions. Developed in 1999 for use for aerospace engineering education, CubeSat use has expanded far outside its original intent. New industries have been developed with CubeSats as the primary driver, allowing collection of important data from space.

Education in space information technology (Space-IT) has relevance outside of aerospace engineering as well. Other disciplines (e.g., computer science, cybersecurity, networking) can provide experience and relevant skills regarding the development, deployment, and use of CubeSats for space missions. Such collaboration can provide innovative advances in the space industry. To increase the availability of tools that can be used to educate on Space IT, we will use a Raspberry Pi and Arduino to build a simulated CubeSat containing radio communication, earth imagery and climate sensor capabilities. The instructions we develop on the design and development of the simulated CubeSat can be used by other educational institutions for similar projects that will allow for Space IT education.

BIOMECHANICAL ANALYSIS OF THE BREAKING SQUAT TECHNIQUE

Presenter(s): Atias, Ariel, Graduate, Kinesiology & Recreation

Mentor: Dr. Michael Torry

Co-Mentor: Dr. Marcel Lopes Dos Santos

Authorship: Ariel Atias, Michael Torry, Marcel Lopes Dos Santos, Samantha McDonald, Jadon Konkel

Intro-

The ability to generate and cope with ballistics force is important for performance, breaking squat (BS) aims to simulate elite sports demands in the weightroom.

Purpose-

Describe and evaluate BS technique and outcome.

Method-

Fifteen D1 T&F jumpers (weight-80.37±10.52kg, height-183.07±5.22cm, age-20.6±2.61). All participants had at least two years of experience in plyometric training and at least one year in strength training, no experience with breaking squat. Conditions included 100% body weight (BW), 150%BW, 200%BW.

Variables- Peak center of mass vertical velocity (PCoMVV), ground contact time (GCT), time to peak force variables (TtPF), peak vertical ground reaction force (PvGRF). One-way ANOVA.

Exercise technique-

During the performance the athlete needs to keep dorsiflexion and flat feet on the ground. Stand straight up with a good posture. Drop down to the highest take off position, around ¼ squat angle 50 º -60º~ flexion in the knee. Jump up as quick as possible as high as possible.

For single leg (SL) BS The athlete will locate the jumping leg underneath the body, the other leg will be in the back providing support (only big toe on the ground,) about 20cm-30cm from the front leg, the athlete will get into stable position and follow the instruction as BS.

Results-

PCoMVV (m/s) mean was in average from condition 1to3-2.25±2.49, 1.88±1.95, 1.55 ±1.26 respectively. There was a significant difference among all conditions ($p<0.001$).

TtPF (millisecond) was in average from condition 1to3-30.14±8, 39.96±33.95, 88.81 ±71.93 respectively. There was a significant difference ($p<0.05$) between conditions 1 and 3, and 2 and 3.

GCT (millisecond) was in average from condition 1to3-199.75±39.65, 269.54±69.16, 327.29±71.15 respectively. There was a significant difference ($p<0.05$) among all conditions.

PvGRF (xBW) was in average from condition 1to3- 2.97±0.64, 2.78±0.59, 2.79±0.49. There wasn't a significant difference between any condition.

Conclusion-

Breaking squat is a ballistic exercise that exposing the body to high forces in a short period of time. The GRF is similar among all conditions of performance which means there isn't a need to add an external weight to achieve the goal of exposing athletes to high GRF. TtPF and PCoMVV and GCT are significantly lower without an external weight compared to adding 50% and 100% of BW, which means there isn't a need to add an additional weight to train these important performance characteristics. These findings can change training methods and have direct implications on athletic training for performance.

MARKETING INTERCOLLEGIATE WOMEN'S SPORTS IN A POST-CAITLIN CLARK WORLD: OPPORTUNITIES AND OBSTACLES

Presenter(s): Bradley, Micaela, Graduate, Kinesiology & Recreation

Mentor: Dr. Liz Sattler

Co-Mentor: Dr. Eric Kramer

Authorship: Liz Sattler, Eric Kramer, Micaela Bradley

As a result of this growing interest in women's sports, greater financial investment has been made, primarily in the professional sport sector, through broadcasting and sponsorship spending, yet these investments still fall well short of the spending allocated to men's sports. And while there seems to be a consensus on the viability and upward trajectory of women's sports, questions remain regarding the gender equity practices of Division I athletics departments, particularly when it comes to offering equitable support for marketing and publicity. Prior research has explored women's sports marketing through the lens of fan behavior, exploring factors impacting spectator attendance, sponsorship recognition, and consumer attitudes and intentions. There remains a dearth of women's sports marketing research in our field. Prior women's sports research has called on academics to "re-think" our research agendas by reaching across the aisle to fellow stakeholders. As a result, this study explores the opportunities and obstacles of promoting women's sports in a Division I athletic department through the perspective of athletic administrators.

While marketing resource allocation has been studied from a quantitative perspective, no qualitative research has explored the topic. For the current study, semi-structured interviews are being used to gather data. Participants include athletic administrators currently employed by Division I athletic departments, whose job duties include marketing or promoting at least one women's sport. The authors will transcribe and code the interview data using a thematic analysis approach. The following themes were identified: return on investment (ROI) drives promotional budgeting decisions, limited target market strategies, the unfair labor burden of female sport student-athletes and coaches, and the importance of having "voices in the room" for women's athletics. Results of the study may offer important insight to college athletic administrators regarding employing effective marketing strategies for women's sports, removing obstacles and investing in proper resources, and maintaining the momentum of growing fan interest in women's sports.

SLAP TEAR FOLLOWING A BANKART LESION REPAIR IN A HIGH SCHOOL ATHLETE: A DISABLEMENT MODEL CASE STUDY

Presenter(s): DiSalvo, Abbey, Graduate, Kinesiology & Recreation

Mentor: Dr. Chelsea Kuehner-Boyer

Patient: An 18-year-old, White male high school athlete with a superior labrum anterior to posterior (SLAP) tear and a history of surgery for a Bankart lesion repair 11 months prior. **Intervention of Treatment:** The injury took a psychological toll on the patient who did not want to have another surgery. The patient chose to pursue conservative treatment initially because while the injury created participation restrictions for his physical education classes and after-school athletics it did not restrict his ability to work or limit his participation in non-sport extracurricular activities. **Results:** Conservative treatment was not found to be physically effective for the patient, however, the decision to begin with conservative treatment provided a psychological benefit for the patient. Additionally, personal and environmental barriers and facilitators as well as activity limitations and participation restrictions significantly influenced the patient's outcomes. **Conclusions:** The outcomes of an injury are influenced by many factors in a patient's life. In this case, the patient's personal factors played a major role in their treatment plan and progression. A major personal barrier for the patient was their psychological response to the injury and distrust of physicians following a previous surgery. However personal facilitators also influenced their desire to pursue conservative treatment including their trust in their athletic trainer, and their desire to play football in the upcoming season. While the patient's activity limitations were significant, their participation restrictions were limited. While their limitations increased their desire to pursue rehabilitation their fear of increasing their participation restrictions following surgery influenced their desire to avoid surgical treatment. Following an injury, all aspects of the International Classification of Function should be considered by clinicians when establishing a patient's treatment and rehabilitation plans. In the case of a high school football player with a SLAP tear following a surgical Bankart lesion repair the patient's personal, environment, activity, and participation factors were accounted for in their rehabilitation plan which led to overall positive mental and physical outcomes for the patient.

THE IMPACT OF EMPLOYEE PSYCHOLOGICAL EMPOWERMENT ON JOB SATISFACTION IN THE HOSPITALITY INDUSTRY: A CASE STUDY OF HOTELS IN A MIDWESTERN CITY

Presenter(s): Nyamekye, James, Graduate, Kinesiology & Recreation

Mentor: Dr. Tracy Mainieri

Authorship: James Nyameke, Tracy Mainieri, Mike Mulvaney, Rachel Smith

Research by Elnaga and Imran (2014) found that employee empowerment has been widely recognized as having a direct relationship with the ability to increase job satisfaction in an organization. A past study by Pelit et al. (2011) conducted on 5-star hotel employees in Turkey found that both behavioral and psychological empowerment had a significant effect on job satisfaction. The components of psychological empowerment typically include meaning, competence, self-determination, and impact (Spreitzer, 1995). These elements contribute to an employee's sense of control and motivation in their work environment. Employee job satisfaction is crucial to hotels as satisfied employees are more likely to deliver exceptional service which is important for the success and sustainability of the hotel industry. This project therefore examines, from the frontline employee's perspective, the levels of employee empowerment and job satisfaction in hotels in a mid-sized Midwest city. The goal of the research is to better understand how employee empowerment and job satisfaction are related. This study is highly relevant and timely, as it addresses important aspects of hotel management and employee performance. It is anticipated that empowered employees would experience higher job satisfaction in traditional work settings**.** The importance of front-line employees in maintaining quality and increasing job satisfaction is highlighted, calling for a change to work settings that actively promote employee happiness. The study integrates primary data sources, utilizing quantitative research approaches to illuminate the workings of employee empowerment and its effects on job satisfaction in the hotel industry. The research technique utilizes a descriptive design and collects data from front-line personnel in hotels through online survey research. In addition to providing hotel managers with guidance, the research advances the field's understanding of this topic by highlighting the significance of employee empowerment. Employee empowerment is critical for long-term survival of the hotel industry.

Keywords: Hotel employees, empowerment, front-line employees, job satisfaction, psychological empowerment

LOWER BODY LEAN MASS ASYMMETRY IS NOT ASSOCIATED WITH PERFORMANCE ASYMMETRIES IN COLLEGIATE BASEBALL PLAYERS

Presenter(s): Parmentier, Taylor, Graduate, Kinesiology & Recreation

Mentor: Dr. Marcel Lopes dos Santos

Authorship: Taylor Parmentier, Isabelle Farm, Evan Semonis, Jadon Konkel, Kelly Laurson, Samantha McDonald, Michael Torry, Marcel Lopes dos Santos

Asymmetry in lower body lean mass has been linked to potential deficits in performance and increased injury risk. Countermovement jumps (CMJ) are commonly used as a readiness indicator for athletic performance. However, there is a paucity of data examining the relationship between asymmetry in lower body lean mass and jump performance, particularly in single-leg CMJs (SLCMJ). **PURPOSE:** To examine whether lower body lean mass asymmetries align with performance asymmetries in SLCMJs. **METHODS:** Data was collected using bilateral force plates during SLCMJs in 34 Division I male baseball players (body mass (BM)= 91.48±8.62kg, height (H)= 1.85±0.05m, age= 21.29±1.45years). Performance data included jump height (JH), flight time (FT), peak force (PF) reactive strength index (RSI), time-to- take-off (TTO), take-off velocity (TOV), braking impulse (BI), propulsive impulse (PI). Lean mass was assessed via dual-energy X-ray absorptiometry (DEXA). Percent asymmetry was calculated for the variables, using the Bilateral Asymmetry Index-1 (BAI-1) equation. Kappa coefficients were calculated to determine levels of agreement between lower body lean mass and performance variables. **RESULTS:** Asymmetry levels for all variables were low: lower body lean mass (-0.55%), JH (-4.36%), FT (-1.36%), TTO (1.77%), TOV (-1.12%), RSI (-3.79%), PF (-1.81%), BI (2.33%), and PI (1.47%). Kappa coefficients ranged from slight (JH=0.15, TTO=0.08, TOV=0.15, PF=0.09, BI=0.03) to fair (RSI=0.21, FT=0.21, PI=-0.21) agreement. **CONCLUSION:** Lower body lean mass asymmetries are not associated with SLCMJ performance asymmetries. Interestingly, the negative fair agreement level suggests that lean mass distribution may be inversely related to propulsive impulse in SLCMJs.

PHYSICAL ACTIVITY METRICS IN UNIVERSITY STUDENTS REFERRED TO AN EXERCISE IS MEDICINE ON CAMPUS PROGRAM

Presenter(s): Vondriska, Matthew, Graduate, Kinesiology & Recreation

Mentor: Dr. Kristen M. Lagally

Co-Mentor: Dr. Tyler J. Kybartas

Authorship: Matthew Vondriska

Gold-level Exercise is Medicine on Campus programs evaluate physical activity as a vital sign and receive referrals for individuals who are not accruing 150 minutes/week of moderate to vigorous physical activity (MVPA). The purpose of this investigation was to examine pre-program physical activity levels in students referred to an Exercise is Medicine on Campus (EIMOC) program. **METHODS**: Participants were ten (8 women, 2 men) students (mean age 26.1 $\pm$ 5.8 years, mean BMI = 29.7 $\pm$ 5.9 kg/m^2) referred to an EIMOC program. Prior to starting the program, participants wore Actigraph GT9x monitors on the non-dominant wrist for a minimum of five days, including at least one weekend day, during free-living. The display on the monitors was not visible to participants. Activity metrics were averaged over days in which the participant had 10 hours of wear time or more. Participants were also asked to self-report their pre-program Stage of Change for physical activity (1= Maintenance, 3 = Preparation, 5 = Precontemplation). **RESULTS**: Most participants indicated that they fell into the "preparation" stage of change, meaning that they intend to be physically active but have not been active at the recommended levels within the past year. However, results from Actigraph monitors indicate that participants were meeting the recommended 150 minutes of MVPA/week and most were achieving an average of at least 7000 steps/day prior to the EIMOC program. **CONCLUSIONS**: Students referred to an EIMOC program for low PA levels may be meeting PA guidelines even if they are not participating in structured exercise sessions. Nevertheless, participants may not be achieving other desired goals, such as fat loss, exercise self-efficacy, reductions in barriers to structured exercise, improvements in health markers, etc. that would benefit from participation in EIMOC programs.

MULTIPLE DERIVATIVES OF COMPOSITIONS

Presenter(s): Guo, Anna, Undergraduate, Physics
Gomez, Lylia, Undergraduate, Physics
Achammer, Ben, Undergraduate, Mathematics

Mentor: Dr. Sunil Chebolu

Authorship: Anna Guo, Lylia Gomez, Ben Achammer, Sunil Chebolu

We define a sequence of polynomials in several variables that can help evaluate higher order derivatives of compositions of exponential and trigonometric functions. In addition, these polynomials encapsulate some important number theoretic and combinatorial sequences. These include partition function, Bell numbers, Stirling numbers of the first and second kind. We also prove formulas on higher derivatives of these polynomials.

MATHIEU-ZHAO SUBSPACES IN PRODUCTS OF CYCLIC RINGS

Presenter(s): Huber, Sarah, Undergraduate, Mathematics

Mentor: Dr. Sunil Chebolu

Mathieu-Zhao subspaces are a generalization of ideals in an algebra and were introduced by Wenhua Zhao in connection to the Jacobian conjecture and its variants. These subspaces have interesting properties and often the problem of classificationsihard. In this project, we investigate the structure of Mathieu-Zhao subspaces of the cartesian product of integers modulo powers of a primepp, $ZZ_{pp} \times ZZ_{pp}$. We will give a complete classification of the usbgroups, Mathieu-Zhao subspaces and maximal Matthieu-Zhao subspaces in these rings.

MUSICAL EXPERIENCES OF ENSLAVED PEOPLE IN THE UNITED STATES DURING THE NINETEENTH CENTURY

Presenter(s): Chaney, Kendra, Graduate, Music

Mentor: Dr. Phillip M. Hash

Authorship: Kendra Chaney

This study investigates the musical experiences of enslaved Blacks in the United States using narratives collected by the Federal Writers' Project (FWP) between 1936 and 1938. The research analyzes interviews with approximately 300 formerly enslaved individuals from 6 states, focusing on music experiences. Using content analysis, we examined excerpts (N = 296 from AL, AR, FL, GA, IN, KY) mentioning music practices and repertoire. Participants described singing during worship, labor, and leisure. Music was also used oppressively by White enslavers to instill fear or for their entertainment.

Limitations of this study included interviewer biases, and participants' advanced age at the time of the interviews. Many interviewers were White or white-collar Black individuals, and their biases often shaped the narratives, including the use of perceived Black dialects. Additionally, the participants' recollections reflect musical practices primarily from the early to mid-1800s and likely do not represent all enslaved Blacks in the U.S. throughout history. Despite these challenges, the study highlights the unifying power of music and its role in preserving social connections under oppression.

MENTAL HEALTH AND STRESS AMONG UNDERGRADUATE MUSIC MAJORS

Presenter(s): Greer, Alyssa, Undergraduate, Music

Mentor: Dr. Phillip Hash

Authorship: Alyssa Greer, Phillip Hash

The purpose of this study was to assess the mental health and stress of undergraduate music majors and to evaluate the efficacy of the Mental Health Inventory (MHI-18) and the Music Major Stress Index (MMSI) with this population. Data analysis compared levels of mental health and stress across different classifications, genders, and degree programs. Findings indicated that the MHI-18 and the MMSI exhibited acceptable reliability and validity with participants in this study. Furthermore, we found that sophomores exhibited heightened mental health challenges than students in other classifications and that non-binary individuals and women reported significantly poorer mental health and higher stress levels than men. In addition, respondents experienced significantly higher levels of anxiety than other psychological states and greater exposure to internal versus external stressors. Quartile analysis of MHI-18 and MMSI scores supported these data and identified varying levels of mental health and stress among students. These findings hold implications for addressing psychological well-being with undergraduate music majors.

PERCEPTIONS OF THE NURSING ROLE RELATED TO GUN VIOLENCE

Presenter(s): Kupferschmid, Megan, Graduate, Nursing
Rappleyea, Megan, Graduate, Nursing
Roque, Rav, Graduate, Nursing
Davey, Katherine, Graduate, Nursing
King, Kristina, Graduate, Nursing
Lynn, Ashley, Graduate, Nursing
Mentor: Dr. Marilyn A. Prasun
Authorship: Megan Kupferschmid, Megan Rappleyea, Rav Roque, Katherine Davey, Kristina King, Ashley Lynn, Marilyn A. Prasun

Introduction (hypothesis, reasoning, etc.)

Gun violence (GV) is a public health crisis, and leading healthcare organizations advocate for healthcare involvement in prevention. Despite their critical role in health promotion and advocacy, limited research exists on the specific contributions of nurses to GV prevention. A literature review found only three articles that addressed gaps in GV education and firearm screening. No studies have explicitly addressed the direct roles of nurses to date. Major nursing organizations advocate for expanding nurses' responsibilities in GV prevention, emphasizing screening, education, research, and policy engagement.

Objectives (significance of research to the field)

This study aims to examine nurses' perceived roles of advocacy, intervention, research, and education to address GV. The research seeks to answer the following question: What are nurses' perceptions of their role in addressing GV in the United States?

Method (research parameters, design, etc.)

An anonymous web-based survey was distributed via snowball sampling through social media and email.

U.S. nurses in clinical, non-clinical, and academic roles completed a 14-item, 5-point Likert scale survey assessing their perceptions. The survey was developed based on existing evidence and underwent peer review before deployment. The internal consistency of the survey instrument was high (Cronbach's α = .931). Data analysis using IBM SPSS Statistics included descriptive statistical methods to examine response trends.

Results (full, partial, or expected achieved from research)

A total of 488 participants completed all survey questions. Most were female (98.8%) and white (86.3%), with an average age of 41.75 years (SD = 12.84). GV was experienced at work by 19.5% of participants and outside work by 16% of participants, while 31.8% of participants reported firearm ownership. A majority of nurses agreed or strongly agreed across all domains: 45%-75.4% in Advocacy, 63.3% in Research, 52.7%-87.9% in Intervention, and 69.2%-95.9% in Education. Additionally, 65.8% strongly agreed that nurses should be educated on how to respond to active shootings, and 55.1% strongly agreed that nurses require advanced GV training.

Conclusion (analysis of full, partial, or expected results)

Nurses overwhelmingly support their role in GV through advocacy, research, intervention, and education. A strong agreement in the Education domain highlights the need for expanded GV training and education for nurses. More research is necessary to identify effective interventions to support nurses in their role in GV.

RISK STRATIFICATION OF PATIENTS PRESENTING WITH CHEST PAIN IN THE EMERGENCY DEPARTMENT: A QUALITY IMPROVEMENT INITIATIVE

Presenter(s): Reyes, Mary Grace, Graduate, Nursing

Mentor: Dr. Marilyn Prasun

Authorship: Mary Grace Oro Reyes, Marilyn A. Prasun, Julie Kenney

Background: Chest pain (CP) is a leading cause of emergency department (ED) visits. It accounts for 35% of observation admissions (OBS) at the organization. Hospital leaders aim to improve patient and organizational outcomes through educating ED nurses and revising the current CP pathway to include the HEART (history, electrocardiogram, age, risk factors, and troponin) score to risk-stratify CP patients. Proper risk-stratification is critical to improve patient outcomes.

Purpose/Aim: This quality improvement (QI) initiative aims to educate ED nurses about the HEART score and the CP pathway to facilitate completion of the HEART score through interdisciplinary collaboration and reduce patients' OBS, LOS, 30-day ED return visits, and 30- day readmissions.

Methods: This QI initiative will utilize the plan-do-study-act cycle. A pre-assessment survey on the ED nurses' knowledge about the HEART score and the CP pathway will be conducted.

Education will be provided on the HEART Score and the revised pathway followed by a post assessment survey. The revised CP pathway will be implemented on patients who present to the ED at a mid-western hospital. Data will be collected for 3 months on patient OBS, LOS, 30- day ED return visits, and 30-day readmissions. The ED leaders will sustain the initiative through monthly huddles and reminders. The pre-post implementation data will be analyzed to determine if outcomes changed.

Findings: Will be forthcoming.

HEALTH LITERACY AMONG INDIVIDUALS DIAGNOSED WITH HEART FAILURE

Presenter(s): Rossi, Gabrielle, Undergraduate, Nursing

Mentor: Dr. Marilyn Prasun

Authorship: Gabrielle Rossi, Marilyn Prasun

Background: Heart failure (HF) is a prevalent chronic condition impacting many within the United States. Nurses play a vital role in providing HF education to patients.

Purpose: To examine the perceived health literacy and the relationship between characteristics and hospitalizations among individuals diagnosed with HF.

Methods: An anonymous survey was snowballed on social media and through email. Participants were 18 years or older with a diagnosis of HF, English speaking, and had internet access. The Brief Health Literacy Screen (BHLS) tool was employed in this survey.

Results: Forty-one individuals participated. They were 70.8+12.9 years old, predominately female (72.5%), Caucasian (90%), having either a bachelor or graduate degree (56.1%), with 3.24+1.7 comorbidities, diagnosed with HF for 9.3+8.2 years, and a 6-month hospitalization rate of 36.6%. Participants reported being extremely confident in filling out forms (43.6%), never experiencing difficulty understanding written information (37.5%), never utilizing assistance to read hospital materials (52.5%), always remembering instructions (47.5%), and reported extreme confidence in managing their HF symptoms (41%). Preferred methods of learning included written materials (77.5%), discussions (42.5%), and diagrams (40%). Barriers to managing HF were physical limitations (66.7%), other medical issues (33.3%) and financial (25.9%). Hospitalizations were significantly correlated with the number of comorbidities $r(32) = 0.37$, $p = 0.03$ and remembering instructions $\chi 2(2, N = 32) = 2.46$, $p = 0.04$.

Conclusion: Although participants were educated, many needed assistance with medical information. Nurses regularly provide education and must be aware of the challenges patients experience in learning and retaining medical information.

THE COMMODIFICATION OF SILENCE

Presenter(s): O'Dowd, Sara, Undergraduate, Philosophy

Mentor: Dr. Cassie Herbert

Authorship: Sara O'Dowd

Silence can be used in many ways. In a commodity model of sex, silence can be taken as consent, as it lacks a verbal rejection. The commodity model can also assume that any lack of a “no” suffices as consent. In this model, a participant's silence may then follow sexual interaction as a defense mechanism against the consequences that can follow speaking out about adverse experiences. Silence from those who are part of a class that faces resistance for speaking out can serve as a defense, an attempt to avoid undesirable consequences that are faced by those who do speak out about their own negative experiences. (Though some defensive silences can carry their own harm.) This defensive use of silence is bolstered by social and cultural feedback displaying examples of those who break their silence about their negative experiences and the consequences that they in turn face for breaking that silence. This study examines these defensive silences and the cultural norms that accompany them under the commodity model of sex.

POLITICS AND GOVERNMENT

ANALYZING DEMOCRATIZATION EFFORTS BY THE OSCE AND THE INTERNATIONAL COMMUNITY

Presenter(s): Jasim, Sara, Undergraduate, Politics and Government

Mentor: Dr. Noha Shawki

The issue of upholding democracy has been something the international community has grappled with for decades. At various points in history, attempts to uphold democracy has been done through economic sanctions, military force, and international pressure from organizations such as the United Nations. The Organisation for Co-operation and Security in Europe (OSCE) works to monitor democratic institutions in member states and provide support for democracy promotion. Building on previous research on democracy promotion, it has been observed that this can be effective in countries that need help consolidating their democracies but proves to be significantly more difficult in countries with strong authoritarianism that have no interest or incentive to follow the OSCE's recommendations. The OSCE has been involved in democracy promotion in Belarus, Bosnia and Herzegovina, and Croatia with varying effectiveness. Belarus is one of the least democratic countries in Europe and has repeatedly ignored the OSCE's recommendations and even shut down the OSCE's office in Minsk permanently. While not perfect, Croatia and Bosnia and Herzegovina have much higher levels of democracy and have been much more compliant with the OSCE's recommendations. In comparing democracy promotion in Belarus, Bosnia and Herzegovina, and Croatia, we can evaluate the effectiveness of the OSCE at democracy promotion and what the international community can do, alongside its limitations, in terms of democracy promotion around the world.

PSYCHOLOGY

ASSESSMENT OF A HOME HANDEDNESS QUESTIONNAIRE FOR TASK CLARITY

Presenter(s): Abbs, Brandon, Graduate, Psychology
Ramos, Britney, Graduate, Psychology

Mentor: Dr. Julie Campbell

A handedness questionnaire which distinguishes between unimanual and role-differentiated manipulations has recently been established (Gonzalez & Nelson, 2021). Research was conducted to determine whether tasks on this questionnaire can clearly be interpreted by a respondent. Item response theory will be used to analyze the responses of each question.

EXAMINING PSYCHOLOGICAL INSIGHTS TO UNDERSTAND ATTEDANCE BEHAVIOR: THE ROLE OF WORKPLACE HEALTH PROMOTION PROGRAMS

Presenter(s): Anderson, Peyton, Graduate, Psychology

Mentor: Dr. Kelly Clemens

Co-Mentor: Dr. Kimberly Schneider

Authorship: Peyton Anderson

Health promotion programs (HPPs) are heavily utilized by organizations and when effective, these programs can have positive implications for a business, such as a reduction in worker absenteeism and presenteeism, increased productivity, and an overall more successful workforce. However, the processes involved in the programs' success has yet to be examined through a psychological lens. This project examined how HPPs lead to effective attendance and health outcomes through the influence of two health-related psychological mediators: health consciousness and health anxiety. Health consciousness (HC) and health anxiety (HA) contribute to work attendance cognitions and outcomes, such as attendance intentions and actual absenteeism, but no research has determined if these constructs predict these variables interdependently or if they are influenced by other cognitive factors, such as an individual's organizational commitment (OC). In the current study, 250 participants who were employed full-time (Mage=40.2,SD=10.9, 65.1% women, 65.5% White), were recruited from Prolific and responded to measures of HC, HA, absenteeism, presenteeism, attendance self-efficacy, attendance intentions, and OC. Health anxiety and health consciousness were associated with all work outcome variables; however, results of a multiple linear regression indicate that only health anxiety was a significant predictor for each outcome. Further, organizational commitment moderated the relationship between health anxiety and presenteeism: participants with high health anxiety were more likely to engage in presenteeism when they also reported high organizational commitment. These results elucidate the distinct influence of health anxiety and health consciousness on attendance behaviors and cognitions, pointing to health anxiety as a crucial factor, and emphasize that this relationship may be influenced by an employee's commitment to their organization. The findings from the current study suggest that organizations should be cautious in disseminating health messages that might inadvertently increase an employee's health anxiety. Such increases in anxiety can reduce the likelihood of individuals engaging in the recommended healthy behaviors, ultimately preventing the organization from benefiting from the positive effects of health promotion programs.

EFFECTS OF JOB ADS ON PERSONALITY TESTING

Presenter(s): Bat-Ireedui, Munkhjin, Graduate, Psychology
Nevinger, Dasha, Undergraduate, Psychology
Little, Alex, Undergraduate, Psychology

Mentor: Dr. S. Burak Ozkum

Authorship: Yonca Gültaş, S. Burak Ozkum, Munkhjin Bat-Ireedui, Fuat Çıkan, Zeynep Işıl Demircioğlu, Sıla Sarsın, Dilek Dursun, Emel Erarslan

Social desirability and its effects have been a popular research topic in social psychology. We will investigate the triggering factors of social desirability by examining discrepancies between personality test responses at two different times and whether they depend on the specific characteristic requirement listed on job advertisements.

Purpose

Person-job fit theory presents the notion that aligning occupational characteristics with individual traits is crucial for increased performance and fulfillment (Manteli & Galanakis, 2022). Via the combination of self-serving bias, faking, and social desirability, in situations where a target behavior could be met, individuals will intentionally engage in idealized and tailored personal attributions or behaviors that are closely fitting with the given situation (König et al., 2015; Lewicki, 1983; Martin et al., 2002; Mortel, 2008; Viswesvaran & Ones, 1999). The effect of social desirability is frequently studied, but little is known about its effective measurement, prevention, or triggering factors. The current study will examine and control the triggering factors of social desirability in personality assessments via the different textual contents of job advertisements.

Procedure

We are currently conducting a study on social sciences and STEM students at a large Midwestern University. There will be two studies (S1 and S2), one with social sciences and another with STEM students, for which data will be collected in two waves (T1 and T2). At T1, both study groups (in progress; completion in December 2024) will take the 60-item Big Five Inventory – 2 (BFI – 2) (Soto & John, 2017). At T2 (15 days after Time 1), each group will be randomly placed in either the control condition of only taking BFI – 2 or one of two experimental conditions. The S1 at T2 will have to read job application instructions or a job advertisement about the sales assistant position before taking the personality test. For S2 at T2, they will either read introverted or extrovert facet-dominated software developer job advertisements and take the personality assessment afterward.

Results

To test if the effect of faking on the personality assessment was present, we will test for significant change in personality facets, specifically in extraversion levels in T2 compared to T1 for both experimental groups in both studies. For both studies, 2x3 mixed ANOVA will be conducted to test whether there are significant differences in extraversion levels over time and the three conditions, respectively. We will also run exploratory analyses on the other personality traits of neuroticism, agreeableness, openness, and conscientiousness. The study will be finalized in February 2025.

Conclusion

The current study will help clarify that factors such as job advertisements and their context can trigger the increasing effects of social desirability and faking on a personality assessment.

ENGAGEMENT AND CWB: APPROACH/AVOIDANCE WORK MOTIVES AS MODERATOR

Presenter(s): Bat-Ireedui, Munkhjin, Graduate, Psychology
Grashoff, Emma, Undergraduate, Psychology

Mentor: Dr. Dan Ispas

Authorship: Alexandra Ilie, Amy Huber, Munkhjin Bat-Ireedui, Sarah Jacobsen, Dan Ispas, Dragos Iliescu

We examined approach/avoidance as a possible moderator of the relationship between Engagement and CWB. Both Engagement X Motive interaction terms explained incremental variance in CWB.

EXAMINING THE EFFECT OF CUE FOCALITY ON NATURALISTIC PROSPECTIVE MEMORY PERFORMANCE

Presenter(s): Caruso, Dante, Graduate, Psychology
Garner, Sierra, Undergraduate, Psychology
Mentor: Dr. Dawn McBride
Authorship: Sierra Garner, Dante Caruso

This experiment aims to investigate the impact of focal and non-focal event-based tasks on prospective memory (PM) performance in a naturalistic setting. Prospective memory involves memory for completing an action in the future. Our initial experiment, along with previous research on PM tasks, has found that completion rates are consistently higher for focal event-based tasks when compared with time-based tasks. However, performance for non-focal event-based and time-based tasks show similar performance. The current study will further examine these findings. In the proposed experiment, participants will be randomly assigned to one of two conditions. Those in the focal task condition will send an email to the researchers the first time they open their email application the next day, whereas participants in the non-focal task condition will send an email the first time they use any electronic device the next day, and compare performance on these tasks at a 3-day delay. We anticipate that completion rates for focal tasks will be higher than those for non-focal tasks based on previous results with similar tasks. The findings from this study will provide insights on the effects of focal conditions in event-based PM tasks and contribute to the growing understanding of the practical applications of prospective memory.

NEW DISCOURSE MARKERS IN MEDIATED COMMUNICATION

Presenter(s): Caruso, Dante, Graduate, Psychology
Sapp, Madi, Undergraduate, Psychology
Mentor: Dr. Allison Nguyen
Authorship: Allison Nguyen, Dante Caruso , Madi Sapp

Discourse markers, or words like but, so, and oh, help us navigate conversations. Discourse markers occur in spontaneous communication (speaking and writing), and mediated spontaneous communication, suchas instant messaging or text (Fox Tree et al., 2023; Guydish et al., 2024; Nguyen et al., 2022), at similar rates and in similar places. With the advent of computer mediated communication, new words have emerged that may function as discourse markers, such as lol, lmao, and idk. These “new” discourse markers can also be spoken aloud, but documentation of where they occur and what they mean is lacking. This study examines and documents both the written and spoken forms of lol, lmao, and idk, with the aim of understanding how often and where they occur, what they mean, and how the placement of these words can contribute to meaning.

We will conduct a two-part experiment to understand emerging discourse markers in both spoken and written contexts. In the first part of the experiment, we will examine what they mean in spoken environments. We will present participants with auditory clips that contain lol, lmao, and idk in different positions, including at the beginning, middle, and end of an utterance (ex: “that’s so funny lol” ,“lol that’s so funny”). After listening to the auditory stimuli, participants will be asked to answer a series of questions about how natural each sentence sounds and about their own experiences using these markers. In the second part of the experiment, we will probe what these markers mean in written contexts. Participants will see written sentences that contain lol, lmao, and idk in different positions. After reading the stimuli, participants will be asked to answer a series of questions about what the new markers mean in context, their own experience using them, and how natural each sentence sounds. We predict that there will be differences between how these words are perceived across position, as well as differences between spoken and written communication.

Understanding how these emerging discourse markers function will expand our understanding of how we construct conversations with our conversational partners, as well as providing more insight into how discourse markers become lexicalized. This has implications for many different fields, including English-language instruction and artificial speech agents. By understanding what â€œnewâ€ discourse markers look like, and how they act, we can teach those learning English (human and robot) how to use them appropriately.

VIRTUAL SUPPORT FOR EDUCATORS: TELECONSULTATION FOR MANAGING STUDENT BEHAVIOR

Presenter(s): Cremer, Hannah, Graduate, Psychology
Shields, Kathleen, Graduate, Psychology

Mentor: Dr. Shengtian Wu

School psychologists play a critical role in the educational system, particularly through their involvement in consultation. Their expertise in academic, behavioral, and emotional support is essential in addressing the diverse student needs and fostering an effective learning environment. The consultation role of school psychologists is pivotal in creating a cohesive support system within schools (Erchul & Sheridan, 2014; LaForett et al., 2022). School psychologists' efforts in data collection and monitoring fidelity are critical to achieving successful outcomes for both educators and students. Despite this important role, barriers such as limited time within each school, high caseloads, and adverse weather directly impact the consultation process, subsequently impacts support accessible to students. Teleconsultation, a technology-mediated consultation modality, leverages tools such as video conference to address barriers faced and facilitate ongoing collaboration between school psychologists and educators throughout consultation (King et al., 2022; Schultz et al., 2018).

The intervention phase of consultation for school psychologists is a critical component of the consultation process in which targeted strategies are developed and implemented to address students' specific needs. Unlike traditional consultation, teleconsultation allows intervention sessions to be recorded and analyzed by a trained professional. Fidelity and feedback can then be provided to educators to boost morale, address concerns, and ensure accurate intervention implementation. Teleconsultation also provides a personalized approach that can be tailored to the students' specific needs, enhancing the effectiveness of intervention and fostering an inclusive and equitable educational environment.

An effective, research-based tool for behavior management within a classroom is the use of a token economy (Heiniger et al., 2022). Token economies rewards the student engaging in desirable behaviors, which can promote behavior modification and structure the classroom environment. When providing services for interventions to educators, this has been seen to be done mostly through in-person services. The current study aimed to examine the benefits of providing intervention via teleconsultation to educators.

HOW DIFFERENT ENCODING STRATEGIES INFLUENCE SEMANTIC MEMORY

Presenter(s): Dow, Michael, Graduate, Psychology
Ivanova, Violeta, Undergraduate, Psychology

Mentor: Dr. Dawn McBride

Authorship: Michael Dow, Violeta Ivanova, Dawn McBride

The present study examines the influence of encoding strategies on the feature boost effect on the occurrence of semantic false memories within the Deese-Roediger-McDermott (DRM) paradigm. Coane et al. (2020) found that taxonomically-related (C+A) lists increase false memories when compared to associative lists without taxonomic relation (N-CA). This result was labeled as the feature boost effect. The current study specifically explores if different encoding strategies (relational, item-specific, and read-only encoding) will impact the rate of false memories and the feature boost effect. All participants were randomly assigned to one of the three encoding conditions, studied half C+A and half N-CA word lists, and then completed a final term-memory recognition test following a brief arithmetic filler task. It is hypothesized that the feature boost will be replicated in the control encoding condition, that the relational encoding will enhance the feature boost, and that the item-specific encoding will reduce this effect compared to the control condition. Findings from the current study have practical implications for improving studying techniques and reducing the susceptibility to false memories in real-world context settings.

NO MONEY, MO' PROBLEMS: IMPACT OF RACE AND INCOME-DRIVEN MICROAGGRESSIONS ON ADOLESCENTS' PERCEPTION OF SCHOOL CONNECTEDNESS AND SELF-ESTEEM

Presenter(s): Flint, Arielle, Graduate, Psychology
Sierra, Bianca, Graduate, Psychology

Mentor: Dr. Brea M, Banks

Authorship: Arielle N. Flint, Bianca Sierra, Brea M. Banks

Microaggressions are a form of everyday racism experienced by individuals holding minoritized identities (Sue et al., 2008). Researchers described microaggressions based on income, as these transgressions can impact individuals who are economically disadvantaged (Scarcedo et al., 2015). Previous research has shown that school personnel and peers view children who come from an economically disadvantaged background as inferior and not capable of success (Speybroeck et al., 2012). Using survey-based methods, I examined the impact of race and income-driven microaggressions on adolescents. I hypothesized that exposure to income- driven microaggressions would be associated with negative outcomes that included perceptions of school connectedness and self-esteem. I also hypothesized that the significance of these relations would depend on participants' race and family income statistics. Results indicated that income-driven microaggressions are significantly related to some aspects of school climate, but not self-esteem. Race does not moderate the relation between exposure to income-driven microaggressions and school climate and self-esteem.

THE ROLE OF SKIN TONE MESSAGES IN SKIN ALTERING BEHAVIORS AMONG UNDERGRADUATE STUDENTS: A QUALITATIVE STUDY

Presenter(s): Gonzalez, Anya, Undergraduate, Psychology
Carlos, Nicole, Undergraduate, Psychology
Herrmann, Jake, Undergraduate, Psychology
Mentor: Dr. Caitlin Mercier
Authorship: Gonzalez, Anya; Carlos, Nicole; Herrmann, Jake; Mercier, Caitlin

The relationship between well-being and skin altering behaviors driven by cultural values surrounding skin complexion are well-documented. Yet people's attitudes towards skin tone remain understudied. The current study qualitatively examines the relationship between skin altering behaviors, messages about one's skin tone, and well-being amongst college students. Implications and future directions will be discussed.

PERCEIVED HEAVINESS OF A WHEELED OBJECT: WHAT MAKES IT FEEL HEAVY OR LIGHT?

Presenter(s): Hishinuma, Sanako, Graduate, Psychology

Mentor: Dr. Jeffrey Wagman

Perceived heaviness of a hand-held object depends on both the mass and mass distribution of that object. In general, perceived heaviness increases when the mass of the object increases and when the mass of that object is distributed more asymmetrically. We conducted a series of experiments investigated whether perceived heaviness of wheeled cart also depends on each of these factors. In these experiments, we placed occluded masses in different configurations on a wheeled utility cart. Participants pushed this cart around cones in a hallway and then estimated the weight of the objects in the cart. The first two experiments showed that the perceived weight increased as mass increased but did not change with changes in mass distribution. The third experiment is further investigating these effects.

HIGH-STAKES PERSONALITY: PREDICTING JOB PERFORMANCE AND VOLUNTARY TURNOVER

Presenter(s): Jacobsen, Sarah, Graduate, Psychology
Tovar, Zenon, Undergraduate, Psychology

Mentor: Dr. Dan Ispas

Authorship: Zenon Tovar, Alexandra Ilie, Dan Ispas, Sarah Jacobse, Munkhjin Mat-Ireedui, Dragos Iliescu, Kevin Askew

We examined if personality (the five-factor model) measured in a high-stakes context is related to job performance and voluntary turnover measured one year later. Conscientiousness emerged as a predictor for both performance and turnover, with openness predicting only turnover.

SOCIAL MEDIA USAGE AND ITS EFFECT ON COURSE PERFORMANCE

Presenter(s): Kaprak, Alex, Undergraduate, Psychology

Mentor: Dr. Dawn McBride

Social media usage continues to increase as society becomes more and more dependent on technology. Because of this increased prevalence, social media is now being studied more heavily in relation to other aspects of daily life. Social media use is especially notable within the student population of universities, with up to 99% of college students owning a Facebook account (Sponcil & Gitimu, 2013). The current study will be conducted to examine social media usage and its effect on course performance as measured by exam scores. The study will be conducted via Qualtrics, with a survey asking students to estimate the number of hours spent on social media per day in the seven days leading up to an exam. The hypothesis is that students who spend more time on social media prior to an exam will score lower compared to students who use social media less.

THE DEVELOPMENT OF NUMERACY SKILLS IN EARLY CHILDHOOD

Presenter(s): Charles, Mahika, Undergraduate, Psychology
Griffith, Jacey, Graduate, Psychology
English, Maddy, Undergraduate, Psychology
Farmer, Emily, Undergraduate, Psychology
O'Dell, Kennedy, Undergraduate, Psychology
Schuur, Kylie, Undergraduate, Psychology
Torres, Daisy, Undergraduate, Psychology
Zimmerman, Madeline, Undergraduate, Psychology

Mentor: Dr. Alycia Hund

Authorship: Jacey Griffith, Alycia M. Hund, Mahika Charles, Maddy English, Emily Farmer, Kennedy O'Dell, Kylie Schuur, Daisy Torres, Madeline Zimmerman

This study is part of a large, pre-registered collaborative project (Many Numbers) that seeks to understand the development of number knowledge during early childhood. The two main objectives are to (1) document cross-cultural similarities and differences in early numeracy skills; and (2) to explore the mechanisms underlying early mathematics skills by analyzing the connections between numeracy skills. The experiment also explores the role of gender, age, and general cognitive skills in relation to early numeracy skills. Two- to five-year-old children will complete four tasks. In the Give N task, children will be asked to place a certain number of plastic fish into a bowl on each trial, demonstrating their understanding of number words. In the highest count task, children will be asked to count aloud as high as they can, up to 120, and their highest correct response will be recorded. In the magnitude estimation task, children will be presented with two groups of dots on a computer screen on each trial and asked which group is larger. Lastly, to test visual memory, children will be shown a group of familiar items. They will then be presented with additional items and asked to identify which items they originally saw. Parents will complete a demographic survey and a relational language checklist. Our results will be included with data from 3,120 two- to -five-year-old children from 130 sites in 34 countries. The large data set will document similarities and differences in children's early numeracy skills, including the role of counting skills and magnitude estimation skills in understanding number words. We expect to find that numeracy skills will improve across age. We also expect that relational language will be related to numeracy skills. These findings will contribute to our understanding of early numeracy skills, providing an important foundation for mathematics achievement.

NAVIGATING A NEW LANDSCAPE: OPPORTUNITIES, SACRIFICES, AND CHALLENGES IN THE ACCULTURATION OF AFRICAN IMMIGRANTS IN THE U.S. AND THE ROLE OF COMMUNITY SUPPORT

Presenter(s): Nalule, Sharitah, Graduate, Psychology

Mentor: Dr. Jordan Arellanes

Co-Mentor: Dr. Caitlin Mercier

The study of acculturation is expansive and deeply explored but still lacks an understanding of the experiences of African immigrants (Agbemenu, 2016; Jung & Syed, 2019). Community-based programs have been shown to enhance the acculturation process and can act as a protective factor to mitigate difficulties after immigration (Mungai, 2023). Berry's Model of Adaptation Processes (Berry, 1992) has informed the study of acculturation and proposes four strategies (e.g., assimilation, integration, marginalization, and separation) that immigrants utilize to orient themselves into their new cultural environment (Berry, 1992; Jiménez, 2005; Choy et al., 2021; Larson & Menna, 2016). However, many have argued that acculturation does not happen in four distinct categories, suggesting that individuals often navigate multiple categories simultaneously (Deslandes, 2022; Deslandes et al., 2023) and acculturation is continuous and does not occur in isolation. Therefore, an intersectionality framework (Kimberlé Crenshaw, 1993) is embedded to provide a deeper understanding of lived experiences in relation to systems of domination. The purpose of this study is to 1) identify how community programs can act as a source of support for African immigrants' acculturation 2) provide insight into effective strategies used within community programs. We provide practical implications for mental health professionals and community practitioners to support African immigrants after immigration.

SCHOOL CONSULTATION: DESIGNING AND IMPLEMENTING INTERVENTIONS FOR EDUCATORS

Presenter(s): Shields, Kathleen, Graduate, Psychology
Kasalko, Jackie, Graduate, Psychology

Mentor: Dr. Shengtian Wu

School consultation is a collaborative process that allows consultants and consultees to enhance student outcomes and to support educators in academic and behavioral challenges (Vaccarello, et al., 2022). Sharing expertise, resources, and ideas among consultants and consultees facilitates not only tailored interventions and possible solutions (DeRish, et al., 2020) but also a role in developing functional behavior assessments (FBA) and behavior intervention plans (BIP) (Parker et al., 2010). This process is essential when developing inclusive, effective, and student-focused educational practices (DeMartino & Specht, 2018). Past research studies have found problem-solving consultation to be an effective process of treatment for improving a variety of behavioral and emotional problems within schools (Feldman & Kratochwill, 2003). There is limited research that focuses on providing school consultation for FBA and BIP, both of which are prevalent in school services. The purpose of this study is to investigate how a developed FBA and BIP facilitated through problem-solving consultation can contribute to enhancing the behaviors of a special education student within the school environment.

REMEMBERING THE FALLEN: PERCEPTIONS OF GOLD STAR FAMILIES

Presenter(s): Tuma, Caileigh, Graduate, Psychology

Mentor: Dr. Mark Swerdlik

Authorship: Caileigh Tuma, Mark Swerdlik, Eric Wesselmann

Program evaluations collect information to determine the effectiveness of a program's efforts to meet established goals. Information obtained can fulfill various purposes, including enhancing program quality, ensuring accountability, and assessing the significance and functionality of the program. The Gold Star Mission (GSM) is an Illinois non-profit organization dedicated to honoring and supporting Gold Star Families (GSF) and keeping the memory of their lost loved ones alive. There exists no previous published research that has evaluated GSM as to its effectiveness in addressing its goals. Thus, we evaluated the impact and effectiveness of the support that GSM provide to GSF.

Six GSM members participated. All were White, with five women and one man who all resided in either Central or Southern Illinois. All participants were members of GSM and have lost a child who was on active military duty at the time of their death. We employed a qualitative research design analyzing participant responses to six questions during a 90-min focus group. The facilitator was one of the researchers, a credentialed school and clinical psychologist with experience facilitating focus groups. GSF participants answered questions concerning their perceptions of the relevance of the GSM goals, the degree to which their needs are being met, and ways to improve the organization's efforts to better meet their needs. We recorded audio from the session and two researchers provided supplementary observations of participants' verbal and non-verbal reactions. We then analyzed these data based on grounded theory analysis. Three coders identified overarching themes that emerged from repeated readings of the transcripts.

Major results included participants (100%) accurately identified the goals of GSM and specific activities that supported them. It was shared that GSM has provided GSF with materials that recognize their fallen as part of GSM activities. Participants (100%) identified Facebook posts, including celebrating the birth dates of fallen soldiers, as most impactful. Participants noted ways other members of the community could better support them, as well as ways GSM can reach out to other GSF who are not currently involved. Participants (100%) indicated they would personally encourage a GSF to get involved with GSM.

Our data support that GSM initiatives are currently meeting the needs of GSF, but additional recommendations for activities and resources could improve future efforts. Limitations of the current study and implications for future research will also be discussed.

AFFECT FREQUENCY AND INTENSITY AS DETERMINANTS OF ACADEMIC MAJOR SATISFACTION

Presenter(s): Tyler, Cory, Undergraduate, Psychology

Mentor: Dr. Margaret Nauta

Authorship: Margaret Nauta, Cory Tyler

Using two-wave data, this study clarifies the role of situational affect in determining college students' satisfaction with their choice of major by measuring both emotion frequency and intensity. Positive emotion frequency and negative emotion intensity were significant predictors, suggesting that situational affect's role in major satisfaction is nuanced.

IMPACTS OF SOCIAL EMOTIONAL SKILLS INSTRUCTION ON SAEBERS SCORES OF ELEMENTARY SCHOOL STUDENTS

Presenter(s): Berardi, Celeste, Graduate, Social Work

Mentor: Prof. Gloria Arroyo Sugg

This study examines the impact of Social Emotional Learning (SEL) instruction on the Social, Academic, and Emotional Behavioral Risk Screener (SAEBRS) scores of students at an midwestern elementary school. SEL instruction was created by researchers using the Collaborative for Academic, Social, and Emotional Learning (CASEL) framework. This research examines the role of SEL in cultivating competencies of self-awareness, self-management, social awareness, relationship skills, and responsible decision-making. This data was used to evaluate changes in social-emotional competencies among students receiving special education services with designated SEL instruction minutes on their Individual Education Plans (IEPs). Expanding on existing research, this study examines the critical link between SEL and student success, as well as the wider impacts of SEL interventions within the school setting. The expected outcomes of this study will contribute to evidence supporting early SEL interventions in improving students' well-being and behavioral outcomes within the school setting and beyond.

EXPLORING CLINICIAN'S RATIONALE FOR INTERVENTIONS TO TREAT PTSD DIAGNOSES

Presenter(s): Beucher, Rebecca, Graduate, Social Work

Mentor: Dr. Gloria Arroryo Sugg

Co-Mentor: Dr. Kate Sheridan

Authorship: Rebecca Beucher

The purpose of this study is to understand how clinicians at The Therapy Clinic (TTC, pseudonym) are treating trauma in clients who have been diagnosed with post-traumatic stress disorder (PTSD, henceforth). Post-traumatic stress disorder (PTSD) is diagnosed by assessing a client's experiences across seven different criteria related to what the client has experienced and their reported subsequent symptoms and behaviors (DSM-V TR, 2013). PTSD can increase a person's risk for suicide and is associated with several comorbidities, such as substance use disorder, anxiety, and depression. Treating PTSD is crucial for bettering the quality of people's lives. Yet, systematically providing evidence-based intervention plans remains difficult. A majority of mental health professionals are not directly trained to treat trauma in their graduate programs. This lack of training includes not understanding how to assess PTSD, and consideration needs to be given to how to treat PTSD in special populations, as trauma often results from one's lived experiences stemming from how people are socially, culturally, and historically situated. This study is being conducted at a clinic that provides clinicians with asynchronous training materials and weekly supervision for new clinicians and interns. The primary aim of this study was to understand how clinicians at TTC rationalize their approaches to treating PTSD in clients diagnosed with PTSD. A secondary aim was to develop increased awareness of the tools and methods clinicians use to treat and assess PTSD. I will interview clinicians at TTC to answer this research question. In this poster, I will present findings resulting from analyzing the interviews.

EFFECTS OF SUGAR AND ARTIFICIAL FOOD DYES ON THE BEHAVIORAL OUTCOMES OF ELEMENTARY STUDENTS

Presenter(s): Blija, Anja, Graduate, Social Work

Mentor: Prof. Gloria Arroyo Sugg

Authorship: Anja Blija

In recent years many researchers, educators, and parents have begun to question the effects of sugar and artificial food dyes on children and their behavior. The present study aims to investigate the effects of sugar and artificial food dyes on the behavior outcomes of elementary students at a rural therapeutic day school. Through an observational study, this research examines how using candy, containing high amounts of sugar and artificial food dyes, as an incentive for students to complete academic tasks affects their overall behavior outcome for the day.

IOP OR PHP? STUDYING ADMISSION CRITERIA FOR MENTAL HEALTH

Presenter(s): Bukowski, Geena, Graduate, Social Work

Mentor: Prof. Gloria Sugg

The present study is being conducted because there is a lack of admission criteria for mental health IOP (intensive outpatient) versus PHP (partial hospitalization) treatment. Studies show (Watkins et al., 2023) that it is important to have the right treatment modality for clients. This study examines the beliefs of what should qualify an individual for inpatient versus outpatient mental health treatment through a thematic analysis. The attending inpatient mental health physicians at a hospital in central Illinois were recruited with diverse experience in the mental health field, to discuss the psychological, social, and personal impact of diagnoses in relation to mental health treatment. The participants shared their knowledge of what criterion is needed to qualify a patient for inpatient versus outpatient mental health treatment. Core themes of what participants had shared is revealed to show that there are preferred criteria for each type of treatment. The applicability of this research is to reinvent an intake assessment for individuals seeking out mental health treatment, so as their success rate in treatment is higher when placed in a setting that is dedicated to the individual's needs.

EVALUATING PROGRESS TRACKING IN EATING DISORDER RECOVERY

Presenter(s): Creek, Rebecca, Graduate, Social Work

Mentor: Prof. Gloria Arroyo Sugg

The concept of therapy is generally to give someone a safe space to discuss whatever they want without judgement. Therapists typically help clients create goals for themselves to reach during a session, the goals are not meant to be set in stone but are there to help the client see the bigger picture and see the progress has been made. How does one accurately track progress made in sessions? Typically, assessments are used to help facilitate and track progress during sessions, but how accurate are the assessment findings? Tracking progress is important in any type of therapy, but when using therapy to help clients cope with eating disorders, tracking progress gains a whole new meaning. As one who works with those who struggle with eating disorders may know, the progress can look a lot different than a regular therapy session. Recovery is not linear, which is common with any sort of recovery program so seeing this as growth or not becomes important when looking at the data. In this project, a data review was done of past and current clients to see the changes in assessments as the clients progressed through therapy sessions.

EXAMINING MOOD EFFECTS FROM A SENSORY ENHANCED ENVIRONMENT

Presenter(s): Curry, Nadia, Graduate, Social Work

Mentor: Prof. Gloria Arroyo Sugg

Co-Mentor: Dr. Kate Sheridan

This study analyzes the effects of a sensory-enhanced environment on students' overall emotional health, focusing on how specific environmental features can positively influence emotional wellbeing and stress levels. Sensory-enhanced environments offer substantial advantages, especially designed for students who struggle with focus, sensory processing, emotional regulation, anxiety, or other mental health diagnosis. By examining these impacts, this study seeks to provide important information and data about how exposure to a sensory enhanced room positively influences mood and emotional wellbeing by providing a calming and stimulating environment that may reduce stress, anxiety, or dysregulated behaviors, and promote growth in emotional intelligence.

PROMOTING EMPATHY AND KINDNESS IN PEER-TO-PEER RELATIONSHIPS

Presenter(s): Eze, Stella, Graduate, Social Work

Mentor: Prof. Gloria, Arroyo Sugg

Authorship: Stella Eze

Peer relationships refer to the interactions and connections that individuals of similar age or status have with one another. They involve social interactions, friendships, and influence from peers. Peer relationships play an important role in children's school lives, and relationships with peers become even more influential as children enter adolescence. High-quality friendships involve companionship, caring, validation, and support. In addition to playing together, good friends feel comfortable around each other and are motivated to resolve conflicts that arise.

Empathy and kindness, which are the focus points of this project, will play a vital role in restoring positive peer relationships among children. Using the social-emotional learning curriculum to teach this will promote positive peer relationships and help children develop essential social skills, such as empathy, cooperation, and conflict resolution. Also, keeping children actively engaged with their peers will lead to more participation in school activities and better academic performance, thereby creating a sense of belonging and community, which is vital for a child's well-being.

HOW HOMELESSNESS AFFECTS MENTAL HEALTH

Presenter(s): Fox, Ericka, Graduate, Social Work

Mentor: Prof. Gloria Arroyo-Sugg

This survey was conducted at a homeless shelter to explore the mental health experiences of individuals within the shelter community. The survey assessed self-reported symptoms of depression, anxiety, and stress, along with access to mental health services, past diagnoses, and barriers to care. Preliminary observations indicate that many of our residents experience frequent emotional distress but may not have recieved formal diagnoses or treatment due to systemic barriers such as lack of insurance, stigmas, and transportation challenges.

This shelter serves as a temporary refuge for individuals facing homelessness, offering shelter, meals, and basic resources. However, mental health support remains a critical, yet often not utilized, service. Many residents report feeling of hopelessness and anxiety, compounded by the instability of homelessness. While some have found mental health care, others avoid services due to distrust of employees, stigmas, or difficulty finding the right help. Understanding these barriers is essential to improving outreach and ensuring mental health services are accessible and effective for the homeless population.

By gathering this data through this survey, the goal will be to highlight the specific mental health challenges faced by the homeless community and identify ways to improve the support services at this homeless shelter. The findings will inform the case managers and services providers such as mental health community partners on how to better address the mental health needs of residents, reduce barriers to care, and advocate for systemic changes. This research emphasizes the necessities of adding in mental health support within the shelter service, ensuring that those experiencing homelessness receive the care they need to improve their overall well being.

DEMOGRAPHIC TRENDS AMONG AUTISTIC ADULTS: INSIGHTS FOR BEHAVIORAL HEALTH PRACTICES

Presenter(s): Fulton, Anne, Graduate, Social Work

Mentor: Prof. Gloria Arroyo Sugg

Many autistic adults face significant mental health challenges, including high rates of depression and anxiety (Longo et al., 2024). These challenges impact individuals and their families at sometimes high levels of distress, especially when left untreated. These unmet mental health challenges often lead to negative outcomes, including difficulties in employment, independent living, quality of life, and satisfying relationships. This study examines the demographics of autistic adults seeking counseling at a local outpatient clinic in a small Midwest town, analyzing trends. This study provides insights into mental health services for autistic adults that may guide future policy and service development.

IMPROVING THE 4TH TRIMESTER: PREPARATION, SUPPORT, MENTAL HEALTH, AND POSTPARTUM EXPERIENCES

Presenter(s): George, Kali, Graduate, Social Work

Mentor: Prof. Gloria Arroyo-Sugg

Co-Mentor: Dr. Kate Sheridan

Authorship: Kali George

The postpartum period is a critical transition for mothers and their families, yet many face challenges related to mental health, preparedness, and support. Research indicates that inadequate postpartum education and planning contribute to increased stress, anxiety, and lower confidence in navigating early parenthood. This study evaluates the current education and planning resources in preparing families for the postpartum period, aiming to identify gaps in care and inform best practices to strengthen postpartum programming.

PROGRAM EVALUATION: PREPAREDNESS OF MSW GRADUATES

Presenter(s): Graci, Sarah, Graduate, Social Work

Mentor: Prof. Gloria Arroyo Sugg

Internal program evaluation for Master in Social Work (MSW) programs are few and far between. Additionally, professional literature surrounding this study's topic is sparse. Program evaluations are important as they help determine areas of improvement and success within an agency (Hamilton et al., 2017). Many students completing a graduate degree are hoping to learn or gather important information and experience before entering the work field. Gathering feedback on a graduate-level program could provide guidance to the school on how to better prepare their students. This research study's purpose is focused on exploring the preparedness of an MSW program's graduates post-graduation. More specifically, exploring the effectiveness of this MSW program in terms of how it prepared its graduates for both clinical and non-clinical social work.

DECREASING MIGRATORY GRIEF THROUGH THE USE OF SUPPORT GROUPS

Presenter(s): Graunke Pasquel, Camila M., Graduate, Social Work

Mentor: Prof. Gloria Arroyo Sugg

Co-Mentor: Dr. Kate Sheridan

Authorship: Camila M. Graunke Pasquel

Although migration is a historical practice, its effects, such as migratory grief (MG), has only recently begun to be studied. The effects of MG are significant, but there is insufficient research about its effect on individuals and evidence-based interventions to address those effects. Support groups have proven to decrease symptomatology of grief, still the unique characteristics of immigration adds a layer of fear, repetitive loss, identity shifts, and unpredictable uncertainty. This study investigates the efficacy of a migratory grief support group, Sanando mi Duelo Migratorio ("Healing my Migratory Grief"), in decreasing MG, increasing awareness of resilience, and increasing the general knowledge of MG. The intent being to recreate this intervention in alternate spaces should it be proven successful.

UTILIZING THE NATIONAL COLLEGE HEALTH ASSESSMENT TO ASSESS COLLEGE STUDENT HEALTH AND WELL-BEING

Presenter(s): Harness, Meghann, Graduate, Social Work

Mentor: Prof. Gloria Arroyo Sugg

Authorship: Meghann Harness

One of the most crucial aspects determining college academic success is how higher education institutions support students' health and well-being. In this poster, I will analyze and discuss the results of conducting the American College Health Association's National College Health Assessment (NCHA) at a small midwestern college. The NCHA survey assesses college student health and well-being, and the results will help provide future well-rounded health and wellness interventions to boost student well-being and overall academic success.

THE EFFECTIVENESS OF MULTIPLE SOCIAL EMOTIONAL LEARNING CURRICULUMS

Presenter(s): Hein, Sarah, Graduate, Social Work

Mentor: Prof. Gloria Arroyo Sugg

Authorship: Sarah Hein

The primary purpose of this study is to explore the effectiveness of the use of multiple Social Emotional Learning curriculums within a given school environment, and more specifically a classroom setting. In 2003 the Children's Mental Health Act introduced such services into school settings, which also resulted in the implementation of Social Emotional Learning (SEL). SEL is defined "as an integral part of education and human development. SEL is the process through which all young people and adults acquire and apply the knowledge, skills, and attitudes to develop healthy identities, manage emotions, and achieve personal and collective goals, feel and show empathy for others, establish and maintain supportive relationships, and make responsible and caring decisions" (Fundamentals, 2024). The Illinois State Board of Education (ISBE) proposed SEL standards, goals, benchmarks, and performance descriptors to help educators and administrators in choosing SEL curriculum that best meets ISBE requirements and school needs. With the continued growth of SEL curriculums, the question that comes to fruition is which one would best meet the needs of 'our' student population? Previous research conducted looked at the different competencies and components when implementing SEL curriculum. It was found that many curriculums have similarities but also some discrepancies, meaning multiple curriculums/programs used can be beneficial for a wider range of materials which in turn reaches a diverse population. Furthermore, research emphasizes the importance of SEL regardless of micro or macro implementation. It supports that schools should implement SEL to promote social emotional wellbeing regardless yet, implementation should be linked to the existing interventions to promote relevance and effectiveness. The investigation of literature demonstrates that SEL is available and in use, yet there is little research regarding the use of multiple curriculums within a given population. This study will measure the perceived effectiveness of multiple SEL curriculums including The Zones of Regulation, Everyday Speech, and Little Spot of Emotions and Feelings by gathering information from teachers who are implementing two or more within the classroom setting using the Regulation Skills Inventory.

EXPLORING VICARIOUS TRAUMA AMONG SOCIAL WORK STUDENTS: IMPACTS AND COPING STRATEGIES

Presenter(s): Hickman, Sarah, Graduate, Social Work

Mentor: Prof. Gloria Arroyo Sugg

Authorship: Sarah Hickman

This study explores vicarious trauma (VT) that is impacting social work students from both the bachelor's social work (BSW) and master's social work (MSW) programs during their practicum field placements. The research examines the prevalence, contributing factors, and coping strategies related to VT within these populations. Key factors contributing to VT include exposure to client trauma narratives, lack of adequate supervision, and personal histories of trauma. The study also highlights various coping mechanisms and supports established by the School of Social Work and the practicum placement sites.

ROLLING FOR CONNECTION: UTILIZING DUNGEONS & DRAGONS TO FOSTER POSITIVE PEER RELATIONSHIPS AMONG YOUTH

Presenter(s): Johnson, Karly, Graduate, Social Work

Mentor: Prof. Gloria Arroyo Sugg

Co-Mentor: Dr. Kathryn Sheridan

Authorship: Karly Johnson

Positive peer relationships are essential for social and emotional development, particularly among youth and adolescents. This study aims to address deficits in peer-to-peer connections by exploring the potential of Dungeons & Dragons (D&D) as a structured intervention to strengthen peer connections. D&D, a collaborative tabletop role-playing game, encourages teamwork, problem-solving, and emotional literacy, making it a compelling tool for youth engagement. The research examines the effectiveness of structured role-playing activities in improving peer-to-peer relationships.

MOVING STUDENTS' CLASSROOM PLACEMENT IN THE SPECIAL EDUCATION PROGRAM

Presenter(s): Kantzavelos, Alexis, Graduate, Social Work

Mentor: Prof. Gloria Arroyo Sugg

This study explores the basis for moving students from one classroom to another within the special education program. The transitions are due to the students' academic progress, behavioral challenges, social-emotional development and Individualized Education Program (IEP) goals. The research will review the decision-making roles of educators, school administrators, and support staff while also reviewing student learning and welfare effects. Through a qualitative research method, online surveys will be used to gather data from special education teachers, school administrators, and related service providers. This research aims at contributing to special education placement best practice discussions through encouraging both data-driven and student-centered approaches which improve academic and social outcomes.

CLIENT ATTENDANCE AT A COMMUNITY MENTAL HEALTH CENTER

Presenter(s): Kimm, Gabrielle, Graduate, Social Work

Mentor: Prof. Gloria, Arroyo Sugg

Authorship: Gabrielle Kimm

This study examines the patterns of client cancellations and no-shows in a community mental health center. Research has shown that in community mental health centers, client attendance is poor. This research is focused on the counselor's perspective of cancellations and ways that they try to increase client attendance.

GRANT-FUNDED AFTER-SCHOOL PROGRAMS IN LOW INCOME SCHOOL DISTRICTS

Presenter(s): Latella, Mollie, Graduate, Social Work

Mentor: Prof. Gloria Sugg

Authorship: Mollie Latella

This research examines the potential correlation between positive academic outcomes and grant-funded after-school programs in lower-income school districts. With a focus on enhancing student achievement outside regular school hours, these programs are often designed to address gaps in educational resources, provide enrichment activities, and offer academic support. The study utilizes quantitative methods to assess the impact of such programs on students' academic performance, including standardized test scores, GPA, and attendance records in school activities. By analyzing data throughout elementary, middle middle education and high schools that have received targeted funding for after-school initiatives, this research aims to determine whether participation in these programs leads to measurable improvements in academic outcomes for students from economically disadvantaged backgrounds. The findings of this study could inform policy decisions and contribute to the growing body of research advocating for increased funding and support for after-school programs as a means to bridge the achievement gap in lower-income communities.

FROM RETENTION TO RECRUITMENT: UNVEILING THE CONNECTIONS IMPACTING ORGANIZATIONAL HEALTH

Presenter(s): Lenoir, Shanice, Graduate, Social Work

Mentor: Prof. Gloria Arroyo Sugg

Authorship: Shanice Lenoir

Employee retention is a pivotal factor in assessing the overall health and stability of an organization. Macro-level organizations in social services often pose a significant challenge with maintaining their retention due to a variety of different circumstances. This study examines the retention rate and its impact on the organizational health, by analyzing key factors such as employee satisfaction, workplace culture, professional development opportunities, and leadership effectiveness to enhance recruitment strategies by understanding which qualities in the organization lead to long-term employment.

DOES PARTICIPATING IN THE PARTNER ABUSE INTERVENTION PROGRAM (PAIP) THAT IS BASED ON DULUTH MODEL PREVENT DOMESTIC VIOLENCE RE-OFFENDING

Presenter(s): Iyiola, Hezekiah, Graduate, Social Work

Mentor: Prof. Gloria Arroyo Sugg

Authorship: Hezekiah Iyiola

Intimate Partner Violence (IPV) is a form of Domestic Violence which is prevalent across societies, including our society. Justice system and policy makers want alternatives to punitive and retributive justice, a legal system that focuses on punishing criminals rather than rehabilitating them. Duluth theory model, a feminist approach, which focuses on the idea that domestic violence is a pattern of behavior that is used to control and dominate an intimate partner. The model's theory is based on the idea that men have historically been able to use their power and control to dominate women. The Duluth model is one of the foremost interventions and one of the most used interventions for perpetrators intimate partner violence. Duluth model has been criticized for gender bias, oversimplification of power dynamics, lack of focus on individual factors, potential for mislabeling, inadequate research support, and limited treatment approach. This study wants to measure the effectiveness of Duluth model to prevent reoffending of intimate partner violence. This study is looking at reoffending of domestic violence abusers after they have attended Partner Abuse Intervention Program (PAIP), that is based on Duluth Model. This study will be a Quantitative Descriptive study that uses numerical data to systematically describe if Duluth model prevents intimate partner violence reoffending.

VOICES IN PRINT: BUILDING A DIVERSE LIBRARY CORNER

Presenter(s): Massey, Kierra, Graduate, Social Work

Mentor: Prof. Gloria Arroyo Sugg

Co-Mentor: Dr. Kate Sheridan

Authorship: Kierra Massey

This program evaluation examines students' sense of belonging within the school community through the implementation of *Voices in Print: Building a Diverse Library Corner*. This initiative provides K-6 students with access to books that reflect a wide range of identities, cultures, and lived experiences, particularly those of marginalized students. A strong sense of belonging within a school has been linked to higher academic engagement, social-emotional well-being, and overall student success. However, many students from underrepresented backgrounds struggle to see themselves included in the materials in the classroom. By incorporating diverse literature into the learning environment this study seeks to explore how representation in books fosters a deep connection between students and their school community.

THE IMPACT OF SCHOOL MEAL PROGRAMS ON FOOD SECRUITY

Presenter(s): Nielsen, Bekah, Graduate, Social Work

Mentor: Prof. Gloria Arroyo Sugg

Co-Mentor: Dr. Kate Sheridan

Authorship: Bekah Nielsen

Although the U.S. is one of the leading food producers in the world, many individuals still face food insecurity, and struggle to provide for themselves and their families. Although there are safeguards in place to help address this issue, food insecurity remains a devastating problem. This study examines the impact of school breakfast and lunch programs as a way to help reduce food insecurity in those households with children. The research in this study utilizes surveys and interviews with school staff and families to collect data on the effectiveness of school meal programs in alleviating food insecurity.

FOOD, FUN, AND SUPPORT: INTERNATIONAL STUDENT'S WELLBEING AT A PUBLIC STATE UNIVERSITY

Presenter(s): Sadiku, Feyipitan, Graduate, Social Work

Mentor: Prof. Gloria Arroyo Sugg

Authorship: Sadiku Feyipitan

The current study will explore the definition and assessment of well-being of, and by international students at a public Midwest college, particularly examining the challenges they face and the support systems available to them. With the number of international students in the U.S. growing, their unique needs, including dietary transitions, mental health concerns, and a sense of belonging, require more attention. Drawing from existing literature and reviewing the health and wellness offerings at the college, this research investigates whether current services sufficiently support international students' well-being and what, if any, gaps exist.

EVALUATING SERVICE PLANNING AS A COLLABORATIVE PROCESS

Presenter(s): Tate, Samantha, Graduate, Social Work

Mentor: Dr. Gloria Arroyo Sugg

Authorship: Samantha Tate

Within settings that provide counseling services, it is important for counselors to work collaboratively with clients to set goals and continue to measure the progress of those goals. The present study explores the effectiveness of an adult service plan based on client and counselor experiences through phone interviews and a survey. Overarching themes will be collected and compared from both participant groups to provide a clear, inclusive picture of the perceived effectiveness of the service planning process to help inform counselors of the importance of collaboration for therapeutic progress.

PROMOTING SOCIAL-EMOTIONAL GROWTH AND INCLUSION THROUGH PEER MENTORING

Presenter(s): Timejardine, Alexis, Graduate, Social Work

Mentor: Prof. Gloria Arroyo Sugg

Co-Mentor: Dr. Kate Sheridan

Authorship: Alexis Timejardine

This study examines the impact of a structured peer mentoring on preadolescents' social- emotional growth. The program pairs at-risk students with trained peer mentors to foster social skills, leadership, and empathy through structured activities. Using qualitative methods, the study evaluates the program's effectiveness in improving communication, emotional regulation, and social engagement. Findings may inform best practices for integrating peer mentoring into school-based interventions and highlight its potential for promoting inclusivity and leadership development.

ARE WE SUCCESSFULLY SUPPORTING YOUTH-IN-CARE

Presenter(s): Williams, Sage, Graduate, Social Work

Mentor: Prof. Gloria Arroyo Sugg

Navigating college enrollment is intimidating in its own right but outright daunting for vulnerable populations, specifically high school-aged youth in care. Research shows that only about 32–45% of high school graduates with foster care experience go on to enroll in college, compared with 69% of high school graduates in the general population (Salazar et al, 2023). The literature on youth in care emphasizes the need for additional support systems during the transition from high school to college, with research consistently showing their vulnerability in pursuing post-secondary education; however, there is variation in which specific supports are most effective in ensuring a successful transition. This study looks at a nationwide program that partners with public universities to facilitate holistic college preparation programs that aim to address the specific needs of youth in care pursuing higher education.

This study aims to examine the extent to which scholars are gaining personal development and skills from practicing in the observed program. This is a mixed-method study that uses secondary data as an outcome program evaluation. A thematic analysis of responses provided by twelve participants is utilized.

Source: Salazar, A. M., Spiers, S. S., Bennett, M., & Haggerty, K. P. (2023). Fostering Higher Education: Preliminary findings from a small, randomized pilot study. Children and Youth Services Review, 150, 106991-. https://doi.org/10.1016/j.childyouth.2023.106991

HOW BEHAVIOR INTERVENTION SUPPORT TEAMS INFLUENCE BEHAVIOR OUTCOMES AND OVERALL SCHOOL CLIMATE

Presenter(s): Wojcik, Grace, Graduate, Social Work

Mentor: Prof. Gloria Arroyo Sugg

Co-Mentor: Dr. Kate Sheridan

Authorship: Grace Wojcik

Behavior Intervention Support Teams (BIST) are specialized practices within schools designated to address students' behavioral challenges through proactive, systematic interventions. These teams often consist of educators, administrators, school counselors and other support staff who work to assess, implement, and monitor individualized behavior plans for students. The primary goal of BIST is to reduce disruptive behaviors in the classroom, improve student outcomes, and create a positive learning environment. Three grade level classrooms and teachers were asked to participate in anonymous surveys designed to get their get their feedback on if BIST feels helpful or harmful to students in the classroom. One class from grades six, seventh, and eighth grades were chosen at random to complete this survey. This study hypothesizes that when BIST is implemented consistently and with adequate resources and staff training, it will significantly improve student behavior and academic performance.

MENTAL WELLBEING AND CHILDHOOD EXPERIENCES

Presenter(s): Yemm, Genevieve, Graduate, Social Work

Mentor: Prof. Gloria Arroyo Sugg

Authorship: Genevieve Yemm

This study aims to assess both Adverse Childhood Experiences and Positive Childhood Experiences impact on the prevalence of anxiety and depressive symptoms in adults. This study explores how supporting factors during childhood (i.e. having at least two positive adult figures, being able to discuss feelings) influence adult mental health, as well as Adverse Childhood Experience (i.e. having a parent using drugs, hitting you, or parents who harmed one another). Traumatic experiences are reportedly one of the main causes of mental health challenges. Over 90% of those with severe mental illness (SMI) report that they have experienced at least one traumatic event during their lives (Mihelicova et al., 2018). Due to rates of trauma increasing, it is important to identify protective factors that can help reduce the risk of mental health issues in the future.

SOCIOLOGY/ANTHROPOLOGY

A TWO-SEGMENT VIGNETTE STUDY EXAMINING STEREOTYPES ABOUT INDIVIDUALS OF DIFFERENT SEXUAL ORIENTATIONS AND GENDERS INCLUDING ATTRIBUTIONS OF BLAME FOR A NON-CONSENSUAL SEXUAL ENCOUNTER

Presenter(s): Flaig, Wendell, Undergraduate, Sociology/Anthropology

Mentor: Dr. Susan Sprecher

Authorship: Wendell Flaig

Using a two-segment online vignette survey (e.g. Ganong and Coleman, 2006), this student research project is being conducted for a capstone course in sociology and examines how a hypothetical person presented in a vignette is perceived on general characteristics (after segment one) and on believability, blame, and other reactions after a non-consensual sexual encounter (after segment two). Differences are examined as a function of the hypothetical person's sexual orientation and gender. Vignette studies are often used to collect data on hypothetical sets of circumstances and are a good way for data collection on sensitive subjects, such as stereotypes about sexual minorities (Collett and Childs, 2011). The study involves a two (gender of hypothetical target) by three (sexual orientation of the hypothetical target) design, resulting in six vignettes with all other information besides gender and sexual orientation being constant across the vignettes. The first segment of the vignette briefly describes basic information about the hypothetical person. In all versions of segment one of the vignette, the presented information is the same except for the gender identity and sexual orientation of the hypothetical person. After reading segment one of the vignette, the participants will answer questions about their perceptions of the described individual. Some questions will focus on the personal characteristics of this individual, including asking participants about various personality traits. The second segment of the vignette presents the same hypothetical individual from segment one meeting in-person with a man and being a victim of a non-consensual sexual encounter. In all versions of segment two of the vignette, the information about the non- consensual sexual encounter is the same except for the gender identity and sexual orientation of the victim. After reading segment two of the vignette, participants will answer questions about their perceptions of the victim and instigator of the non-consensual sexual encounter. Some questions will focus on the concept of blame for the non-consensual sexual encounter, including asking participants which person is the most responsible for the encounter and whether the encounter is considered sexual assault or rape. This vignette study is still currently being conducted, but preliminary results will be available by the date of the University symposium.

YOUTH DEVELOPMENT, NEIGHBORHOOD CONTEXT, AND INSTITUTIONAL AGENTS: PERSPECTIVES FROM COACHES AND DISADVANTAGED ADOLESCENTS

Presenter(s): Folk, Rainah, Graduate, Sociology/Anthropology

Mentor: Dr. Aaron Pitluck

The role of institutional agents—individuals who use their resources, network, and authority to promote success—has been well-documented in the context of higher education, particularly for disadvantaged minority youth. These studies have shown that for many young people, institutional role models such as teachers, coaches, and mentors provide the needed support for development and help in navigating challenging situations, especially for adolescents classified as disadvantaged based on socioeconomic status. A critical gap exists, however, in understanding the impact of the relationships formed between institutional agents and youth during mid-adolescence, a significant developmental stage where young people begin to establish independence and self-awareness. Therefore, this study seeks to explore the role of school sports coaches as institutional agents for the development of high school students from minority- majority neighborhoods, particularly in urban and suburban areas. Specifically, this research will leverage responsive interviews to gather personal narratives that focus on the nuanced interactions between coaches and students exploring how different social contexts—shaped by geography, race, and socioeconomic status—affect youth development outcomes. Ultimately, this project will offer insights to address critical gaps in understanding the role of institutional agents in diverse social environments and will open avenues for further exploration into how suburban and urban landscapes influence youth development.

DEFINING NEIGHBORHOOD IDENTITY FOR COMMUNITY PROJECTS & RESPONSIBLE DEVELOPMENT

Presenter(s): Keeran, Laura, Graduate, Sociology/Anthropology

Mentor: Dr. Livia Stone

The City of Bloomington currently has thirty-four neighborhoods and districts mapped within the city limits. These neighborhoods and districts are based on things like historic surveys and homeowners' associations which do not necessarily accurately represent how residents interact with their communities. The City of Bloomington's 20-year comprehensive plan, adopted in 2015, lists the following three goals in its Neighborhoods chapter: "Promote creation of connected neighborhoods, focused on people, rather than isolated subdivisions in the Emerging areas," "Create and define neighborhood identity where none currently exists," and "Celebrate the uniqueness of Bloomington's neighborhoods" (55-57). Some of the sub-goals under these three goals suggest such things as creating neighborhood toolkits for residents to use to organize themselves, requiring councils, boards, and commissions to "consider a neighborhood's uniqueness" (57) before signing off on development proposals, and creating more pedestrian friendly neighborhood development. With this project, I seek to address these comprehensive plan goals by collaborating with community organizations and residents to learn more about Bloomington's neighborhoods through the eyes of people who live and work in these communities.

This project focuses on the Gridley Allin Prickett (GAP) neighborhood on Bloomington's West side and will serve as a pilot project for the City. Historically, the GAP area has been home to immigrant railroad laborers and Bloomington's African American population. The neighborhood has had a long history of community organizing, with two prominent labor organizers coming out of Bloomington's West side in the late 19th and early 20th centuries. Today the neighborhood is home to well-known community organizations such as the West Bloomington Revitalization Project and Western Avenue Community Center and recently became home to First Assembly of God's newest Bloomington-Normal location. A representative from First Assembly reached out to us with an interest in getting to know the community to understand how they can best serve it. With a shared interest in helping the GAP neighborhood we decided to partner on this project in spirit of our value to center the residents' needs. The results of this research will be communicated through a neighborhood identity guide that will be shared on the City's website for community members and City employees to easily access and utilize for community projects and development initiatives. We will also be holding a community meeting to bring residents together to discuss our results. If this project proves to be successful, it can serve as a guide for future neighborhood identity guides to be created for other parts of Bloomington.

SELF-DISCLOSURE IN GETTING-ACQUAINTED INTERACTIONS: GENDER EFFECTS AND OTHER FINDINGS

Presenter(s): Woodruff, Ella, Undergraduate, Sociology/Anthropology
Sprangler, Kinlee, Undergraduate, Sociology/Anthropology
Laux, Sydney, Undergraduate, Sociology/Anthropology
Youngman, Dela, Undergraduate, Sociology/Anthropology
Ford, Paris, Undergraduate, Sociology/Anthropology
Putterlik, Calvin, Undergraduate, Sociology/Anthropology
Little, Alex, Undergraduate, Sociology/Anthropology
Bounds, Lauren, Undergraduate, Sociology/Anthropology
Schwarzentraub, Cassie, Undergraduate, Sociology/Anthropology
Koester, Madison, Undergraduate, Sociology/Anthropology
Oros, Ashley, Undergraduate, Psychology
Flaig, Wendell, Undergraduate, Sociology/Anthropology
Beckman, Kaley, Undergraduate, Sociology/Anthropology

Mentor: Dr. Susan Sprecher

Authorship: Sydney Laux, Kinlee Spranger, Dela Youngman, Lauren Bounds, Paris Ford, Alex Little, Calvin Putterlik, Ella Woodruff

(Assisted by Kaley Beckman, Wendell Flaig, Madison Koester, Ashley Oros, and Cassie Schwarzentraub)

Past research into the get-acquainted process has focused on a number of issues, including factors that lead to an enjoyable and meaningful first interaction. While the get-acquainted process, and the role of self-disclosure, have been studied using a variety of methods, conducting research on first interactions in a laboratory setting provides several advantages. For over a decade, our mentor (Dr. Sprecher) has been studying the get-acquainted process in a laboratory setting. In our research poster, we will present data compiled over multiple years to examine if certain factors may predict the level of self-disclosure that occurs in the dyads in the first interaction. Although the exact procedures varied across studies, the basic method used in the laboratory studies involved pairs of college students engaging in a self-disclosure task to become acquainted with one another. Participants (N=1,914) were asked to communicate with each other either in the same room (face-to-face) or in

separate rooms over the computer (e.g., Skype). Participants completed a preliminary survey as well as a post-interaction survey. The pre- interaction survey assessed characteristics, such as demographic information (gender), attachment styles, and social anxiety/shyness. The post-interaction survey asked participants about their reactions to the interaction, including their perceptions of their own self-disclosure and the degree to which they thought their partner had disclosed. Preliminary findings indicate that overall levels of self-disclosure were relatively high across dyads. Overall, female participants reported higher self-disclosure than male participants, and female-female pairs demonstrated greater disclosure levels compared to male-female pairs (due to limited instances of male-male interactions, these pairs have been excluded from analysis). Additionally, individuals with higher levels of shyness or social anxiety disclosed less during these interactions than their less shy counterparts. Furthermore, of the different attachment styles, those who were secure or preoccupied reported disclosing more to their interaction partner. The mode of communication (either face-to-face or via Skype) did not significantly affect self-disclosure levels. These and other results will be presented in our poster.

CRITICALLY ENGAGING WITH CHILDREN'S ENVIRONMENTAL MEDIA TO TEACH ABOUT CLIMATE CHANGE IN ELEMENTARY CLASSROOMS

Presenter(s): Anggriawan, Robby, Graduate, Teaching and Learning

Mentor: Dr. Sarah Reid

Authorship: Sarah Reid, Robby Anggriawan

Drawing upon Critical Media Literacy and Ecolinguistics, this research study critically examined the interplay of visual, aural, and gestural modes of communication in an animated cartoon about global warming to ascertain the environmental messages. For this inquiry, we explored the following research question: *How does an animated cartoon for children depict global warming, climate change, and climate action?* We applied a multimodal content analysis approach to identify and analyze the environmental discourses, or the stories-we-live-by, within the cartoon so that we might understand how children's environmental media shapes young children's perceptions of climate change issues and whether it empowers children to engage in climate change action. The findings provide insights into the precision of climate change information and concepts presented, how animals' stories impacted by global warming develop interconnectivity, and how readers can be participants in reducing human-made climate change. This offers needed perspectives into our multimedia text selections and how we attend to the stories-we-live-by within those texts in children's textual engagements when learning about climate change.

Keywords: animated cartoon, literacy educators and climate change, environmental media, multimodal content analysis

HIP HOP AS A COUNTERNARRATIVE

Presenter(s): Patel, Viraj V., Graduate, Teaching and Learning

Mentor: Dr. Anna Smith

Authorship: Viraj V. Patel

Delgado and Stefancic (2001) define counter-storytelling as method of storytelling that "aims to cast doubt on the validity of accepted premises or myths especially ones held by the majority" (p. 144). Based on the premise that social reality is constructed, Delgado (1989) argues that stories are multifaceted and can differ in their form and content when shared by different individuals. Depending on the narrator, different elements of the same story can be highlighted or muted. By giving the marginalized and disenfranchised communities a voice to articulate their realities in their own words, and in turn allowing them to write their own stories and histories, counternarratives serve a crucial role for Critical Race Theory (CRT).

As a form of storytelling, Hip Hop music was born out of the sociopolitical realities of underserved and neglected communities in post-industrial New York City (Rose, 1994). Comprising five elements of "MCing/ rapping, graffiti art, breakdancing, DJing, knowledge of self" (Chang, 2005, p. 90) – Hip Hop continues to serve as a meaning-making mechanism for artists and audiences alike. Highlighting the centrality of narrative, andré douglas pond cummings (2010) articulates the relationship between CRT and Hip Hop as "a furious kinship" (p. 499). Specifically, the two are similar due to their, "use of narrative in response to racism and injustice in a post-civil rights era, a fundamental desire to give voice to a discontent brewed by silence, and a dedication to the continuing struggle for race equality in the United States" (p. 500).

Arguably, rap music is the most easily recognizable element of Hip Hop. As a result, this work seeks to explore the ways in which Hip Hop's elements of MCing/rapping function as counternarratives. Namely, undertaking an emic approach, this work infuses quotes and vignettes from artist interviews and songs, with scholarship on CRT and counternarratives, to identify and dissect the specific practices which enable MCs and Rappers to serve as authors of counternarratives.

NETWORK SEGMENTATION WITH THE IMPLEMENTATION OF THREATS

Presenter(s): Bredesen, Ryan, Undergraduate, Technology

Mentor: Dr. Stephen Mujeye

Network segmentation is an important cybersecurity strategy that aims to reduce an attacker's ability to move laterally and increase security within a network. This study evaluated the effectiveness of network segmentation by simulating attacks on two networks using Infection Monkey. The objective of this study was to examine the impact of network segmentation on the detection and spread of threats across several virtual machines. Two network environments were created, the first unsegmented network (Network A) and a segmented network (Network B). Multiple simulated attacks were conducted on both networks. The attacks confirmed that the segmented network achieved better protection because the simulated malware did not detect any of the virtual machines in within that network. However, all virtual machines in the unsegmented network were compromised. Network segmentation proves to be an effective method for enhancing security by preventing the detection and spreading of threats across virtual machines. This research showcases the importance of implementing segmentation in network security strategies. Future research should assess the impact of segmentation options and differentiate between them to defend against different types of threats.

IMPROVING SOFTWARE QUALITY THROUGH AUTOMATION TESTING STRATEGIES

Presenter(s): Krupa, Shukla, Graduate, Technology

Mentor: Dr. Sally Xie

This research explores how automation testing strategies can significantly improve software quality in various industries. As software becomes central to modern life, the demand for high reliability and reduced defects grows. Automation testing addresses limitations of manual testing, such as inefficiency and human error, by employing tools and techniques to streamline the testing process. This study investigates the impact of automation on defect reduction, test coverage, and team productivity. It also proposes a theoretical framework for analysing how automation tools interact with software development processes. This research aims to identify best practices and provide actionable insights for implementing automation testing to achieve superior software quality.

HINKS SMOKEHOUSE CASE STUDY

Presenter(s): Simons, Maili, Graduate, Technology

Mentor: Dr. Sally Xie

This research explores strategies to differentiate Hink's Smokehouse BBQ sauce brand in a competitive market, with a specific focus on the impact of packaging on consumer perception and demographic reach. The study examines key factors such as unique flavor profiles, packaging materials, design elements, and marketing strategies to identify ways to enhance the brand's appeal and customer base. Employing a comprehensive methodology that includes literature reviews, NAICS data, and Census data analysis, the research provides actionable insights aimed at targeting younger and eco-conscious consumers. Recommendations emphasize the integration of sustainability into packaging design while addressing aesthetic and functional elements. By leveraging these insights, Hink's Smokehouse can strengthen its market presence in the Bloomington-Normal area and beyond, achieving a competitive edge and cultivating brand loyalty.

Afternoon Session Abstracts

AGRICULTURE

THE STATE OF STANDARDBRED HORSE RACING IN ILLINOIS

Presenter(s): Adam, Steven, Undergraduate, Agriculture

Mentor: Dr. Michelle Kibler

Authorship: Steven Adam, Michelle Kibler

At the peak of horse racing in Illinois, the state had five racecourses that supported Standardbred and Thoroughbred racing. By 2025, only two of the five facilities remain. In recent years the industry has faced challenges including declining attendance, competition from other forms of gambling, and aging infrastructure. This study aims to analyze the current state of Standardbred horse racing in Illinois compared to this industry in the past, exploring the impact of competition from casinos, the challenges of attracting and retaining younger audiences, the number of foals each year, and the state of existing racing facilities. Additionally, this study will compare Thoroughbred racing in Illinois over the same metrics with emphasis on differing actions taken in the Standardbred industry. Data on the number of annual races, foal registrations, and purse money will be collected through the US Trotting Association, the US Department of Agriculture, and the Illinois Department of Agriculture. Outcomes from this study will include potential strategies for revitalizing the Standardbred industry and expectations for the future of the industry. By addressing these challenges and exploring innovative solutions, Illinois can work towards supporting the Standardbred racing industry and ensuring its success for the future.

ECONOMIC IMPLICATIONS IN MANAGEMENT OF EQUINE LAMINITIS

Presenter(s): Chaidez, Lizbeth, Undergraduate, Agriculture

Mentor: Dr. Michelle Kibler

Authorship: Lizbeth Chaidez

Laminitis is a musculoskeletal disease in horses that can be described by the separation of the hoof wall and atrophy of the laminar tissues due to inflammation which then results in the rotation or sinking of the coffin bone. The objective was to understand the financial implications of various therapies in guiding economic decisions in managing laminitis in horses. Due to the extensive causes of laminitis in horses, it is hypothesized that the cost of therapies varies depending on severity of lameness and veterinary diagnosis. Research will be conducted based on average costs collected regarding surgical procedures, therapeutic shoeing, analgesics, and nutritional diet formulation prices in the USA. Results were analyzed using descriptive statistical analysis. Chronic laminitis surgery through surgical tenotomy of the deep digital flexor tendon averaged $3,050 USD with a standard deviation of $35.35 among three US equine veterinarian hospitals. Analgesics such as phenylbutazone averaged $39.61 USD with a standard deviation of $7.30 for 100 tablets from two veterinary hospitals. Therapeutic boots averaged $167 USD with a standard deviation of $45.29 from two brands. Nutritional therapy included omega-3 fatty acid supplementation, limited grazing of pastures especially in spring and autumn, and vitamin and mineral supplementation. The fatty acid supplement average price for 1 gallon of product was $70 USD with a standard deviation of $42.79. The average cost for 50 lbs. of timothy hay was $64.50 USD with a standard deviation of $6.36. Vitamin and mineral blends averaged $34.88 USD with a standard deviation of $17.70 from three blends including selenium and vitamin E. The prices of therapies for laminitis management vary widely, with surgery being the most expensive therapeutic option compared to phenylbutazone and nutrition. Therefore, for acute laminitis, surgery may not be an economically preferred method of therapy compared to nutrition or medication. At the same time, one should consider the benefits of surgery in preventing progression of acute laminitis. The economic decisions on managing laminitis are dependent on consumer's willingness to spend and severity of symptoms. Further research is necessary to assess the effectiveness and long-term prevention of recurrence, particularly in relation to price.

UTILIZATION OF GOLDEN PENNYCRESS MEAL IN POULTRY DIETS

Presenter(s): Knowles, Marley, Graduate, Agriculture

Mentor: Dr. Nicholas Heller

The objective of this pilot study is to evaluate performance in broiler chickens fed diets containing golden pennycress (GPC) meal, with and without a flavor additive. Cornish Cross three-day-old chicks (n=12) were randomly assigned one of three diets. Golden pennycress (*Thlaspi arvense*) is a winter cover crop grown in the Midwest that is rising in popularity as a cash crop used for biofuel production. After oil is pressed out of the seeds, a meal remains that is usually discarded. Incorporation of this meal (23% protein, 15% fat) into feedstuffs for broilers would be an efficient way to make biofuel production more sustainable. Diet one served as the control with no flavor additive or GPC meal, diet two contained 10% GPC meal, and diet three contained 10% GPC meal with 3% dried molasses. Each diet was administered for five days, a washout period of three days consisted of the same diet offered pre-study, after which a different diet was administered for the same period. A washout between each diet change was to negate carryover effects. Applications of diets continued until all units had received all the treatments. Effectiveness of the diet and performance of the chickens was assessed through metrics like feed intake, water intake, body weight (BW), and feed conversion. A premeasured amount of feed and water was allotted each day and the amounts remaining were measured to assess feed and water intake. BW was recorded every day to track growth and to calculate feed conversion. Data were analyzed using the PROC MIXED procedure of SAS 9.4. No significant differences in weight gain were found between sequences of diets ($P=0.8085$). Carryover effects had no significant difference, meaning previous order of diet received did not impact the broiler's performance ($P_{X1}= 0.5598$, $P_{X2}=0.0.2497$). Period yielded significant results, which was to be expected as the broilers were at different ages whilst receiving treatments ($P=<0.0001$). However, all animals within a sequence were not different ($P=0.6390$) and contributed effectively zero variance. Results of this study indicate that GPC can be included in broiler diets as there was no difference in performance and growth compared to the control diet ($P=0.8118$). The successful integration of GPC into broiler diets promotes sustainable agricultural practices by utilizing a potentially unused product from a cover crop. Further studies could assess long term effects of GPC consumption on broiler carcass quality and performance at increased inclusion rates.

IMPACT OF WINTER COVER CROPS ON SOIL FERTILITY

Presenter(s): Mackey, Keion, Graduate, Agriculture

Mentor: Dr. Rob Rhykerd

Winter cover crops coupled with best management practices may sequester atmospheric carbon dioxide in soil. However, traditional soil sampling techniques used to measure soil fertility that homogenize the top 15-20 cm of topsoil may not account for changes in fertility near the soil surface. This study evaluated the impact of selected winter cover crops on soil fertility when added to a corn-soybean rotation typical of the U.S. Midwest. A randomized complete block design was established at the Illinois State University Research Farm in Lexington, IL in the fall of 2020. Winter cover crop treatments included a fallow control, pennycress, cereal rye, and a pea, clover, radish, oat mix. The summer cash crop was soybean in 2021 and corn in 2022. Soil fertility was measured by a commercial laboratory from soil cores that were divided into segments of 0-2, 2-4, 4-6, 6-8, 8-10, 10-15, 15-20, 20-25, & 25-30 cm. Above ground cover crop biomass was measured at termination, just before planting the summer cash crop. Summer cash crop yields were determined using a yield monitor. Results showed concentrations of N and organic matter were greatest near the soil surface and decreased with soil depth. Cereal rye produced the most above ground biomass. The soybean yields following pennycress and the PCRO mix was similar to the fallow treatment. Corn yield was lower from treatments with cover crops. Although the cover crops may have decreased summer cash crop yields, in this initial transition to including cover crops in the rotation, their positive ecosystem services, long-term soil health benefits, and potential as a winter cash crop should be considered in an overall economic analysis. Additionally, longer-term studies are needed to evaluate the potential for cover crops to sequester carbon.

INFLUENCE OF PRIOR LIVESTOCK EXPERIENCE ON STUDENT STRESS IN AN INTRODUCTORY ANIMAL SCIENCE COURSE

Presenter(s:) Tierney, Kathleen, Graduate, Agriculture

Mentor: Dr. Drew Lugar

The shifting student demographic in the animal science discipline has forced institutions to reevaluate the structure of their animal science courses. With an increase in students pursuing animal science degrees with no prior livestock experience, it can be expected that the experiential learning aspect of many of these courses will pose some level of stress on the students. Pilot data were collected on eight participants in an Introduction to Animal Science course during hands-on animal laboratories to determine the demographic effect on student stress. A respondent-reported survey was utilized to collect participant demographic data on prior livestock experience, age, discipline, and hometown classification. Physiological data were collected using heart rate monitors (Polar H9, Polar Electro, Kempele, Finland), and psychological data were collected using a modified perceived stress scale survey (PSS; Cohen et al., 1983). Students with no prior livestock experience had lower heart rates ($P \leq 0.007$) but greater respiration rates ($P \leq 0.048$) than students with prior livestock experience. There were no effects of demographic data on the perceived stress of students ($P \geq 0.249$). Further research or reproduction of this study are suggested to continue investigating student stress evoked by animal handling courses.

UN NUDO EN EL CORAZON

Presenter(s): Brecheisen, Leah, Undergraduate, Art

Mentor: Dr. Melissa Johnson

Authorship: Leah Brecheisen

In 1973, Augusto Pinochet seized power of the Chilean government, with the help of the United States Central Intelligence Agency, overthrowing their democratic government and ending the life of their socialist president Salvador Allende. It was in that moment that Cecilia Vicuña, at the time a student at Slade School of Fine Art in London, became exiled from her country and positioned herself against the dictatorship. Vicuña is a multimedia artist who creates paintings, quipus, poetry, sculptures, installations, performances, and films. Her work heavily reflects on Latin American politics, starting with the five- thousand-year-old quipu, an ancient mnemonic device of knotted thread, and deep diving into the power of language. The invisible string tying her diverse oeuvre together is in fact not a string, but a knot. From the knot of her reviving quipu to the entanglement of objects in her assemblages or words in her poems, the connection between her historical and ecological passions is simply a knot. She critiques the neglect of the government and calls attention to the voices lost. In examining the tangible and nonliteral knots infused in her work, this research advances the discourse of Vicuña's intentionality and resistance in her interdisciplinary artistic practice.

KURT SCHWITTERS, MERZ, ABSTRACTION, AND THE PROCESS

Presenter(s:) Latko, Morgan, Undergraduate, Art

Mentor: Dr. Melissa Johnson

The word “Merz” comes from “Kommerz Bank”, and ultimately is a nonsense word. However, it defines the creative process of abstract artist Kurt Schwitters, and details how he created his works throughout three decades. Through Merz, Schwitters combines his previous knowledge of traditional artmaking with abstraction using a variety of mediums and materials, specifically in the form of collage. Schwitters’ process had an emphasis on the unconventional, specifically with his use of materials, which would often comprise of labels and scraps he would find on the ground. His abstraction still includes formalities seen in fine art, with emphasis on composition and color. Through exploring his creative process and methods, as well as analyzing a variety of Merz works, I documented my findings and my own process creating my own Merz collage based upon my findings.

BEYOND THE QUEER UMBRELLA: MAPPING LESBIAN ARTISTS' EXHIBITIONS AND SCATTERED HISTORIES SINCE THE 1970S

Presenter(s): Murphy, Tess, Graduate, Art
Mentor: Dr. Melissa Johnson
Authorship: Tess Murphy

Lesbian artists in the mid-twentieth century did not participate in the Women's Art Revolution of the 1960s due to the anti-institutional values of radical lesbian ideology. However, lesbian art exhibitions emerged in New York and San Francisco during the 1970s, with documentation found in archives and feminist journals. Despite this, few art historical books include evaluations of lesbian sensibilities within art, and only one published anthology, written by Harmony Hammond in 2000, is solely dedicated to this subject. This research aims to uncover contemporary publications that explore lesbian aesthetics in art and address visibility issues arising from the reclaimed use of "Queer" as an umbrella term.

The research employs contextual and archival analysis to identify where and how lesbian artists have shared their works. Preliminary findings indicate a significant lack of access to information about works created by lesbian-identifying artists within the art historical context. This study highlights the necessity for dedicated scholarly attention to lesbian artists and their contributions, emphasizing the gaps in current art historical literature. This project proposes a quarterly periodical to address these gaps and expand the conversation. It would focus on conducting studio visits with lesbian-identifying artists, showcasing exhibition spaces that host lesbian-identifying artists, and collecting articles on the works written by art historians. These articles will employ art historical methods such as formal, contextual, iconographic, and technical analysis to examine lesbian artwork. This periodical could shed light on this history and provide contemporary artists in 2025 with influence and inspiration, fostering a more inclusive and comprehensive understanding of lesbian contributions to the art world.

THE ENLIGHTENMENT GALLERIES: 18TH CENTURY COLONIALISM ON DISPLAY IN THE 21ST CENTURY

Presenter(s): Stanford, Kaili, Undergraduate, Art

Mentor: Dr. Katie Bruhn

The British Museum's Enlightenment Galleries serve as a striking example of how colonial-era narratives persist within contemporary museum spaces. Designed to replicate 18th-century display methods, the gallery organizes objects according to Enlightenment principles of classification, reinforcing a Eurocentric framework that continues to shape public understandings of non-European cultures. This paper and poster critically examine how the gallery perpetuates colonial ideology by privileging British perspectives of contemporary history over those of the peoples from whom these objects were taken. Rather than providing a nuanced, self-critical examination of Britain's imperial past, the gallery presents an uncritical celebration of Enlightenment knowledge production, obscuring the violent histories behind its collections.

This study interrogates the language used in museum signage, the layout of the exhibition, and the British Museum's institutional position on repatriation to reveal how colonial power dynamics are embedded within museum practices. Drawing on the writings of Edward Said and the more recent work of scholars such as Dan Hicks and Alice Procter, this paper argues that the continued display of looted artifacts under the guise of historical preservation sustains imperial narratives and silences Indigenous voices. The case of the Early Shield from New South Wales—an Aboriginal artifact contested by Indigenous activists— illustrates how the museum resists calls for restitution while making superficial acknowledgments of colonial harm.

Ultimately, this paper and poster contend that museums must move beyond mere recognition of their colonial pasts toward active decolonization which requires returning stolen artifacts. I advocate for the use of anti-colonial practices to restructure curatorial frameworks to prioritize Indigenous agency. Without such efforts, institutions like the British Museum will remain complicit in the perpetuation of colonial knowledge systems, reinforcing the same power hierarchies that fueled their collections.

CHARACTERIZATION OF SPREADING DEPRESSION SUSCEPTIBILITY UNDER HYPOXIA IN THE DROSOPHILA LARVAL BRAIN

Presenter(s): Al Mokbil, Mohammad, Graduate, Biological Sciences

Mentor: Dr. Wolfgang Stein

Co-Mentor: Dr. Allison Harris

Authorship: Mohammad Al Mokbil, Wolfgang Stein, Allison Harris

Spreading depression (SD) is a pathophysiological phenomenon characterized by a slowly propagating wave of depolarization of neurons, followed by a transient near-complete suppression of electrical activity in large areas of the brain. SD events are associated with a massive ion redistribution, yet the primary trigger of SD initiation remains unknown. In humans, cortical SD is linked to migraine with aura as it travels across the visual cortex, which subsequently activates pain pathways and contributes to headache pathogenesis. In insects, SD can be triggered by different stressors, causing it to travel across the central nervous system, followed by a transient neural shutdown.

Despite the extensive research on stress-induced SD in the drosophila brain, there is still a gap in understanding if inter-animal variability plays a role in SD initiation, whether repeated-SD events influence the animal's resilience against SD, and if hypoxia affects the SD susceptibility. To address these questions, we developed a protocol using Drosophila larvae where SD was triggered by rapid cooling (22°C → −1°C). SD was imaged in larval fly brains with pan-neuronal GCaMP expression using fluorescent calcium imaging and was identified by a rapid and dramatic increase in the fluorescence that spreads across large sections of the nervous system. Preliminary data show that there is a wide range of SD-initiation temperatures among different animals with an average of (2±0.9°C, N=12) ranging from 0.5°C to 4.5°C, suggesting that there is a large inter-individual variation among larvae in SD susceptibility.

However, exposure to repeated coolings showed a significant downward trend ($p=0.05$, N=9) where 1st cooling had the highest SD initiation temperature (2.7±1.1°C) and the 5th cooling had the lowest SD initiation temperature (1.8±0.9°C). This suggests an increased resilience against cooling-induced SD events. Finally, to determine how oxygen availability influences SD susceptibility, SD initiation was investigated in condition 1, the animal's spiracles were in air while in condition 2, the spiracles were blocked by Vaseline. These experiments showed no substantial difference in SD initiation temperature between hypoxic larvae (4.7±3.7°C, N=15) and non-hypoxic larvae (5.4±3.3°C, N=14, $p=0.57$), suggesting that oxygen availability does not play a role in the SD initiation temperature. Currently, we are testing other environmental stressors in to see whether they influence SD temperature change.

QUERCETIN'S IMPACT ON CHICKEN EMBRYO DEVELOPMENT UNDER CORTICOSTERONE INFLUENCE: A COMPARATIVE STUDY WITH TROLOX

Presenter(s): Ayorinde, Ayomi, Undergraduate, Biological Sciences

Mentor: Dr. Ryan Paitz

Authorship: Ayomi Ayorinde, Ryan Paitz

This study investigates quercetin, a natural antioxidant, for mitigating the negative effects of elevated cortisol levels on chicken embryo development compared to trolox, a vitamin E derivative known for its antioxidant properties. The hypothesis posited that quercetin would effectively modulate mitochondrial functions and lower plasma cortisol levels, thus promoting better embryo development under stress. This research serves a broader purpose by contributing to strategies that could counteract high cortisol levels during pregnancy and ultimately mitigate fetal mortality risks. The experimental design involved four treatment groups: trolox + oil, trolox + corticosterone (TroloxCort), quercetin + oil, and quercetin + corticosterone (QuercCort). An oil overlay was utilized to prevent evaporation and assess the isolated effects of the antioxidants. Corticosterone was introduced to simulate stress conditions and evaluate the protective capabilities of both antioxidants. Results revealed that quercetin did not surpass trolox in protecting embryos from the adverse effects of corticosterone. The QuercCort group had a survival rate of only 23%, and the surviving embryos were significantly smaller compared to those in other treatment groups. These findings indicate that while quercetin exerts some positive influence on embryo development in the presence of elevated cortisol levels, it does not provide superior protection compared to trolox. In conclusion, further research is essential to explore the underlying mechanisms through which these antioxidants operate and optimize their applications in alleviating the negative impacts of stress hormones on embryonic development. This study highlights the significance of strategically selecting antioxidants for therapeutic uses related to stress in embryogenesis while laying the groundwork for future studies in human pregnancy contexts.

UNDERSTANDING THE ROLE OF DYSTROPHIN ISOFORMS ON MUSCLE FUNCTION IN THE NEMATODE C. ELEGANS

Presenter(s): Batchelor, Paige, Undergraduate, Biological Sciences
Fazyl, Adina, Graduate, Biological Sciences

Mentor: Dr. Andrés Vidal-Gadea

Authorship: Paige Batchelor, Adina Fazyl, Andrés Vidal-Gadea

Duchenne Muscular Dystrophy (DMD) is a severe X-linked recessive disorder characterized by progressive muscle degeneration due to the absence of dystrophin (dys-1), a critical structural protein that protects muscle fibers from contraction-induced damage. This disease primarily affects boys and leads to progressive disabilities, often resulting in premature death. While multiple isoforms of the dystrophin gene have been identified, their specific contributions to muscle function remain an area of active investigation.

This study aims to characterize the different dystrophin isoforms in Caenorhabditis elegans a nematode worm able to recapitulate the hallmark pathologies of DMD. I am using molecular tools to assess the molecular identities and expression patterns of short dys-1 isoforms in C. elegans.

Understanding the differential expression of dystrophin isoforms in C. elegans will enhance our knowledge of dystrophin’s role in muscle function and may provide insights into therapeutic approaches for DMD.

CHARACTERIZING THE EVOLUTION OF RESISTANCE TO REACTIVE OXYGEN AND CHLORINE SPECIES IN UROPATHOGENIC ESCHERICHIA COLI

Presenter(s): Bhimwal, Tanisha, Graduate, Biological Sciences

Mentor: Prof. Jan-Ulrik Dahl

Authorship: Tanisha Bhimwal, Magdalena Urlaub, Sadia Sultana, Jan-Ulrik Dahl

Uropathogenic *E. coli* (UPEC) represents the major cause of urinary tract infections (UTIs), one of the most prevalent bacterial infections that occurs worldwide over 400 million times each year. UPEC ascend to the bladder, where they need to withstand phagocytosis by innate immune cells, exposing the pathogen to antimicrobial reactive oxygen and chlorine species (RO/CS) like hypochlorous acid (HOCl). HOCl, the active component of bleach, inflicts extensive damage to cellular macromolecules, causing significant protein aggregation and lipid peroxidation. However, the high number of often recurrent UTIs suggest that UPEC has adapted to the highly oxidizing environment of the inflamed urinary tract quite well. Microorganisms like yeast can display faster and more robust responses to severe stress if they or their progenitors experienced a prior mild stress, known as *priming*. Priming enhances resilience and survival in fluctuating or adverse environments by enabling organisms to better withstand subsequent challenges. RCS such as HOCl, exert selective pressure on bacteria, driving the evolution of mechanisms that mitigate its antimicrobial effects. However, whether "priming" with RCS will have similar protective effects on subsequent exposures of UPEC is still unknown. My preliminary data suggests that UPEC exposed to sublethal RCS stress exhibit enhanced resistance to subsequently applied lethal dose of RCS. Thus, my data suggest that priming through prior RCS exposure improves survival outcomes of oxidatively stressed cells, thereby stimulating bacterial growth under stress conditions. I also observed that priming gives fitness advantage regardless of nature of oxidant. Based on these findings, I hypothesize that priming with sub- lethal RO/CS improves survival to subsequent lethal stress. Another remarkable observation from my preliminary data is that RcrB, which we recently identified as an essential RCS defense component, also plays a role in CFT073's priming response as primed rcrB-deficient cells do not show improved survival response when compared to lethal RCS. The goal of this work is to uncover physiological mechanisms underlying UPEC's adaption to RCS, identifying genes responsible for eliciting this increased survival. This enables us to understand how UPEC thrives in chronic inflammatory environment of urinary tract and subsequently causes recurrent infection. This work proposes to answer potential hidden mechanistic insights on how UPEC interacts with host defenses during oxidative stress.

INVESTIGATING *SK-3* TYPE SPORE KILLING IN *NEUROSPORA CRASSA*

Presenter(s): Damkoehler, Kole, Undergraduate, Biological Sciences
Davis, Alexander, Undergraduate, Biological Sciences

Mentor: Dr. Tom Hammond

Authorship: Kole Damkoehler, Alexander Davis, and Tom Hammond

Neurospora crassa is a genus of fungus that exhibits a phenomenon called *Sk-3* spore killing. *Sk-3* spore killing occurs when an *Sk-3* killer strain mates with an *Sk-3* sensitive strain, and it results in the death of half of the offspring (ascospores). A DNA interval called *i350*, located on *N. crassa* Chromosome III, has previously been identified as critical for spore killing. To obtain a more detailed understanding of this DNA interval, we are examining related DNA intervals *i386,* i*399* and *i408*. Our preliminary results indicate that deletion of *i386* disrupts spore killing, suggesting that this interval overlaps a gene required for the process. We are currently examining the effect of deleting intervals *i399* and *i408*. Our results will help precisely define the position of an *Sk-3* killer gene, which is a critical step toward elucidating the mechanism of spore killing.

LIVER X RECEPTOR (LXR) REGULATES 5β-REDUCTASE (AKR1D1) EXPRESSION IN AVIAN EMBRYOS: IMPLICATIONS FOR YOLK STEROID METABOLISM

Presenter(s): Drew, Emily, Undergraduate, Biological Sciences
Reynolds, Delaney, Undergraduate, Biological Sciences

Mentor: Dr. Ryan Paitz

During times of stress, humans and other vertebrates produce increased levels of glucocorticoids. Embryonic glucocorticoid exposure can have detrimental effects on both development and the long-term ability to respond to stressors. Steroid metabolism in the placenta can regulate exposure to these maternal glucocorticoids and potentially prevent negative effects. In birds, the extra-embryonic membranes contain an enzyme, 5β-reductase (AKR1D1), that converts corticosterone (an active glucocorticoid) to 5β- corticosterone (an inactive glucocorticoid). We have previously shown in chicken embryos that ligands for Liver X Receptor α (LXRα), such as 22R-hydroxycholesterol, can in induce AKR1D1 expression. The goal of this research was to investigate a range of doses of 22R-hydroxycholesterol that induce AKR1D1 expression and whether 22R-hydroxycholesterol can also induce the expression of other genes regulated by LXRα (ACOT13, SCD1, and FASN). To test this, fertilized eggs were injected with varying doses of 22R- hydroxycholesterol at the onset of development. After 48 hours, extraembryonic membranes were sampled, and gene expression was measured through qPCR. It was observed AKR1D1 expression was induced at higher dosages. We found that 22R-hydroxycholesterol induced AKR1D1 and ACOT13 at certain dosages but had no effects on the other two genes at any dose. This indicates that 22R-hydroxycholesterol is capable of regulating a number of LXRα related genes.

THE EFFECT OF STRESS ON FEMALE PREFERENCE AND PERCEPTION OF A SOCIALLY RELEVANT STIMULUS

Presenter(s): Enevold, Alyssa, Graduate, Biological Sciences

Mentor: Dr. Fernanda Duque

Authorship: Alyssa Enevold, Fernanda Duque

Animals must respond adaptively to social cues for survival. Stress, often triggered by environmental factors, can alter how animals perceive and respond to social stimuli. A stress hormone, corticosterone (CORT), prepares the body to respond to a stressor; thus, it is used as a measure of stress levels. In the brain, different types of stress, such as acute and chronic, can cause shifts in the expression of neuropeptides that modulate social behaviors and changes in behavior. By assessing female preference for a socially relevant stimulus under different stress conditions, we can understand how stress impacts social behavior and the perception of social signals. In our study, female zebra finches (*Taeniopygia guttata*) will undergo different stress conditions (control, acute - AS, and chronic - CS). Then, using a three-chamber setup, females will be presented with a choice between a social stimulus consisting of a picture of a female zebra finch paired with contact calls or a control stimulus consisting of a scrambled zebra finch image and pink noise. Females will also have the option to remain in the neutral zone (no stimulus). We will assess social preference by comparing how long they spend near the control vs the social stimulus. We predict that there will be a negative correlation between preference for social stimulus and CORT levels so the control birds will have the lowest CORT levels and strongest preference, while the AS birds will have the highest CORT levels and weakest preference. This is consistent with research showing that chronic stress causes a dampened stress response while acute stress induces high CORT levels due to the novelty of the stressor. In the future, we will assess changes in the gene expression of social neuropeptides in sensory regions of the brain due to stress condition. This work will provide insights into how stress might change the perception of social signals, thus affecting future decision-making and social interactions.

ECOLOGICAL CONSEQUENCES OF BTI LARVICIDING ON AN AQUATIC MESOCOSM COMMUNITY

Presenter(s): Everly, Jaclyn, Graduate, Biological Sciences

Mentor: Dr. Steven Juliano

Bti larviciding is a common method of mosquito control despite conflicting evidence from research regarding its unintended impacts. We conducted a semi-field experiment to evaluate the effectiveness of Bti larviciding using mesocosms stocked with simple invertebrate communities that simulated ephemeral ponds commonly treated with Bti. Shade cloth covering the mesocosms was temporarily removed twice at the start and middle of the experiment to allow oviposition and natural colonization by local mosquitos (primarily Culex spp). Four experimental treatments manipulated the addition of predatory odonate nymphs (families Aeshnidae, Libellulidae, and Ceonagrionidae) and a one-time application of Bti to the mesocosms, allowing us to test the immediate (24 hour) and short-term (1 month) effects of Bti on mosquito production in the presence and absence of predators that may contribute to biological control. Mosquito production was measured by collecting larvae and pupae with dip cup samples (~350 mL) and water column samples (~4,000 mL) and collecting adults from emergence traps in the initial and final mosquito cohorts. We found that larval abundance was significantly lower in Bti-treated mesocosms than in untreated mesocosms, and that larval abundance decreased significantly in the 24 hours following Bti application. Two weeks later, the presence of predators and residual Bti had no significant effects on mosquito oviposition; however, we did find that adult mosquito production in the final cohort was significantly lower in Bti-treated mesocosms compared to untreated mesocosms. Our results show that Bti larviciding is effective against mosquitoes irrespective of predator presence.

INVESTIGATING THE ROLE OF DYSTROPHIN IN SMOOTH AND STRIATED MUSCLES OF C. ELEGANS

Presenter(s): Fransen, Hope, Undergraduate, Biological Sciences
Niha, Shifat, Graduate, Biological Sciences
Fazyl, Adina, Graduate, Biological Sciences

Mentor: Dr. Andrés Vidal-Gadea

Authorship: Hope Fransen, Adina Fazyl, Shifat Niha, Andrés Vidal-Gadea

The structural protein dystrophin is essential for maintaining muscle integrity by protecting against contraction-induced damage. While its role in striated muscle has been widely studied, its function in smooth muscle remains less understood. Caenorhabditis elegans provides a valuable model for studying dystrophin's role in both muscle types, as it possesses enteric smooth muscle involved in defecation and striated pharyngeal muscle required for feeding.

This study investigates whether dystrophin-deficient worms (dys-1 mutants) can be functionally "rescued" through plasmid-mediated dystrophin expression in specific muscle types. We analyzed four experimental groups: (1) wild-type controls with intact dystrophin, (2) dystrophic VG02 mutants lacking dystrophin, (3) dys-1 mutants with dystrophin restored using a small version (isoform) of the gene, and (4) dys-1 mutants with dystrophin restored using the intermediate isoform of dys-1 normally found in smooth muscles. To assess muscle functionality, we quantified enteric across groups.

Our findings provide insight into the muscle-type specific roles of dystrophin and the extent to which targeted gene expression can restore function. Understanding dystrophin's impact on smooth and striated muscle integrity in C. elegans contributes to broader efforts to develop therapeutic strategies for Duchenne Muscular Dystrophy.

URBAN HEAT AND FORAGING BEHAVIOR: INVESTIGATING THERMAL ADAPTATION IN HOUSE MICE

Presenter(s): Fritz, Sylvia, Graduate, Biological Sciences

Mentor: Dr. Javier delBarco-Trillo

Different areas of the world are affected disproportionately with more urbanized areas averaging hotter daily temperatures compared to less urban areas due to a phenomenon known as the Heat Island Effect. Small mammals, such as mice, are especially vulnerable to these large and lasting changes in temperature. Adverse temperatures can affect the foraging behaviors of mice which can influence their availability as both consumers and prey in their respective ecosystems. This study aims to investigate the effects of heat stress on the effective foraging behavior of house mice (Mus musculus) and assess if mice from urban areas are more resistant to hotter temperatures than mice from less urban areas. The experiment will use two groups of mice: one from rural origin and one from urban origin. Behavioral assay tests in hotter temperatures will assess decision-making in food selection, risk-taking, and exploration patterns. It is hypothesized that urban mice which were theoretically exposed to hotter conditions will have a higher tolerance to foraging in increased temperatures. The results will provide us with a better understanding of how hotter temperatures and urbanization may affect survival and adaptability, which in turn could contribute to a broader understanding of behavioral adaptation in response to increasing temperatures and differences between areas of different levels or urbanization.

INTERROGATING DROUGHT RESILIENCE ON NATURAL ACCESSIONS AND CRISPR GENERATED MUTANTS IN PENNYCRESS (THLASPI ARVENSE L.)

Presenter(s): Gautam, Liza, Graduate, Biological Sciences

Mentor: Dr. John Sedbrook

Authorship: Liza Gautam, Nikhil Jaikumar, Xinxin Ding, Carol Kiam Assato, Mary Phippen, Winthrop Phippen, Pubudu Handakumbura, John Sedbrook

Drought poses a serious threat to crops and food security. According to the National Integrated Drought Information System (NIDIS), 40% of the U.S. was under drought in 2020. It is predicted future droughts will become more common and severe due to global warming. Pennycress (*Thlaspi arvense L.*), a close relative of canola and Arabidopsis, is being developed as an oilseed-producing winter cover crop for the U.S. Midwest and other temperate farming regions. As part of our crop improvement efforts, we are focusing on further understanding how pennycress responds to drought and identifying genetic changes that can improve drought tolerance without negatively impacting seed yields. Our preliminary analyses indicate that pennycress naturally has drought tolerance superior to Arabidopsis, which may coincide with this species' know cold tolerance. Using CRISPR-Cas9 mutagenesis, we generated pennycress single, double, and triple mutants targeting ten genes shown in other species to negatively regulate drought responses. The genetic, biochemical, and metabolomic data presented here support our hypothesis that pennycress responds to drought differently from Arabidopsis.

GEOGRAPHIC VARIATION IN THE TIMING OF SONG IN THE GENUS *MICROCERCULUS*

Presenter(s): Geyer, Tara, Undergraduate, Biological Sciences

Mentor: Dr. Carlos Rodriguez-Saltos

Authorship: Tara Geyer, Carlos Rodriguez-Saltos, Fernanda Duque

The evolution of song produces acoustic geographic variation across species. While geographic variation in song has been widely studied in songbirds, little is known about timing-based variations. We investigated variations in song timing across the genus *Microcerculus*. Using a crowd-sourced database, we obtained recordings across the entire geographic range of multiple *Microcerculus* species. By measuring inter-note interval durations, we classified songs into known timing variants or identified novel variants where necessary. We then tested whether these variants are separated across geographically distinct populations. This project will shed light on the evolution of timing in birdsong by studying a group of birds with wide variation in the timing of their songs.

CORTICOID STEROID EFFECT AND PATHWAYS IN C. ELEGANS

Presenter(s): Gomez, Margarita, Graduate, Biological Sciences

Mentor: Dr. Andrés Vidal-Gadea

Authorship: Margarita Gomez, Andrés Vidal-Gadea

Duchenne muscular dystrophy (DMD) is an X-linked genetic disorder affecting approximately 1 in 5,000 male births in the United States. It is caused by mutations in the dystrophin gene, leading to a loss of dystrophin protein and subsequent muscle degeneration. Dystrophin plays a crucial role in stabilizing muscle cells by linking the cytoskeleton to the extracellular matrix. Without it, muscle fibers become susceptible to contraction-induced damage, resulting in membrane instability, calcium influx, mitochondrial dysfunction, and oxidative stress.

Currently, there is no cure for DMD. However, corticosteroid treatments, particularly prednisone and deflazacort, have been shown to slow disease progression. These glucocorticoids exhibit anti-inflammatory and immunosuppressive effects, delaying muscle deterioration and prolonging ambulation. Despite their benefits, long-term steroid use presents significant side effects, including weight gain, growth suppression, osteoporosis, and metabolic disturbances. Recent advancements have introduced vamorolone, a dissociative steroid with reduced side effects, which received regulatory approval in 2023.

C. elegans, a model organism widely used in biomedical research, has been instrumental in studying the effects of steroids on muscle degeneration. In the context of DMD research, C. elegans models have been utilized to examine the impact of glucocorticoids on muscle structure and function. Studies have shown that glucocorticoid treatment, including the administration of prednisone and deflazacort, can influence gene expression related to muscle maintenance and inflammation. Furthermore, the findings from C. elegans research contribute to understanding the mechanisms of steroid-induced side effects, such as metabolic alterations and oxidative stress, which can inform potential therapeutic strategies for DMD patients.

Ongoing research focuses on improving treatment efficacy and minimizing adverse effects while exploring novel therapeutic strategies to enhance dystrophin restoration and mitochondrial protection. This study aims to provide insight into the non-inflammatory pathways on which these steroids act on. Identifying pathways on which these drugs act contributes to the overall understanding of these treatments. Additionally, investigating the molecular pathways allows for the potential to create pathway-specific steroids, reducing unwanted adverse effects.

INVESTIGATING THE ROLE OF DYSTROPHIN IN MOTOR NEURON FUNCTION, A DEEPER DIVE INTO THE NEURONAL PATHOLOGY OF DUCHENNE MUSCULAR DYSTROPHY

Presenter(s): Jones, Mackenzie, Graduate, Biological Sciences

Mentor: Dr. Andrés Vidal-Gadea

Authorship: Mackenzie Jones, Adina Fazyl, Shifat Niha, Tope Awe, Jack Fostiak, Andrés Vidal-Gadea

Duchenne muscular dystrophy (DMD) is a severe genetic disorder caused by a loss of function mutation in the *DMD* gene on the X chromosome. This mutation results in the absence of dystrophin, a key structural protein in muscles. When dystrophin is absent the primary pathology of DMD can be seen through progressive muscle degeneration. However, individuals who suffer from this disease also display neuropsychiatric disorders, such as anxiety and depression, alluding to the role of dystrophin within the nervous system. It has been suggested that dystrophin plays both a signaling and structural role in the nervous system, particularly at the neuromuscular junction (NMJ). Motor neurons located in the NMJ play a crucial role in receiving signals from the CNS and subsequently transmitting those signals to muscle fibers. However, the precise mechanistic function of dystrophin and its various isoforms within this context has not been discerned. This study aims to investigate the role of dystrophin within the neuromuscular junction, focusing on its contribution to the system both pre- and post-synaptically.

To examine dystrophin's various functions, we will utilize the well-studied model organism *Caenorhabditis elegans* (*C. elegans*). The nematode *C. elegans* presents a distinct advantage in this research endeavor, primarily due to its transparent body structure and its extensively well-mapped and understood nervous system. This facilitates an unparalleled opportunity for detailed and intricate observation of the complex synaptic processes occurring along the neuromotor pathway. This study's first aspect is to elucidate the expression and localization of dystrophin isoforms within the neuromuscular junction. Next, dystrophin rescue strains will be utilized and recorded to determine whether specific isoforms are required for proper synaptic transmission.

This study will enhance our knowledge of the role dystrophin has in motor neuron function and how its loss contributes to the neuronal pathology in Duchenne muscular dystrophy. Through this increased understanding the development of more holistic and effective treatment strategies can be developed, which tackle more than just muscle pathology. Future studies could focus on how dystrophin may be involved in other neuronal processes, such as circuit development.

OF MICE AND MUTATIONS: FREQUENCIES OF DELETERIOUS ALLELES IN SMALL, HIGHLY ISOLATED POPULATIONS

Presenter(s): Koeplin, Madeline (she/her), Graduate, Biological Sciences

Mentor: Dr. Pirmin Nietlisbach (he/him)

Authorship: Madeline Koeplin, Pirmin Nietlisbach

Genetic drift, or the alteration of allele (i.e. gene variant) frequencies due to chance, is strongest in small populations and also affects deleterious, or harmful, alleles. Weakly, moderately, and highly deleterious alleles may be impacted in different ways depending on the size of the affected population, due to the co-occurring forces of natural selection. However, this has rarely been researched in wild populations and it remains unclear how especially the frequency of highly deleterious alleles is affected by small population size. The deer mouse *(Peromyscus maniculatus*) populations on the Canadian Gulf Islands are a great system to study varying deleterious allele frequency. These populations differ in size from one island to another, and genomic studies in our lab have confirmed that these populations are strongly isolated from each other. The objective for my study is to determine how highly and moderately deleterious allele frequencies differ in differently sized populations. I will determine this by studying island populations of deer mice in Canada's Gulf Islands. I will use samples collected in 2021, 2022, 2023, and 2024 as well as from the upcoming field season in the summer of 2025.

To capture the mice, I bait and set 120 Sherman live traps, with two traps at each site and sites being eighteen meters apart. When a mouse is found in a trap, I weigh them, visually determine their sex and reproductive status, and collect a small outer-ear sample using a hole punch. If the mouse is an adult, I will also take tail, foot, and ear length measurements. After DNA extraction from the tissue samples, sequencing, and amplification, I then search for areas within the genome, which will show differences in genetic diversity in the different populations. This will determine how the frequency of mildly and highly deleterious alleles vary in the differently sized populations. By using the deer mouse populations on the Canadian Gulf Islands, I can address questions regarding how purging and genetic drift can impact the genetic makeup of very isolated and small populations. There have been very few empirical studies regarding how population size and isolation can impact deleterious allele frequencies in natural populations. My study broadens our knowledge in evolutionary and conservation genetics, and in the face of increasing habitat fragmentation, this knowledge is needed.

ENHANCEMENT OF GROWTH OF STAPHYLOCOCCUS AUREUS AT LOW TEMPERATURES BY ANTIMICROBIAL UNSATURATED FATTY ACIDS AND THEIR ESTERS

Presenter(s): Paul, Sharanya, Graduate, Biological Sciences
Mentor: Dr. Jan Ulrik Dahl
Co-Mentor: Dr. Brian J. Wilkinson
Authorship: Sharanya Paul, Vineet K. Singh, Kelly M. Hines, Jan-Ulrik Dahl, and Brian J. Wilkinson

Staphylococcus aureus, a gram-positive bacterial pathogen recognized for its virulence, possesses the ability to invade an array of bodily organs and tissues, resulting in morbidity and mortality. It has been established that S. aureus incorporates exogenous straight-chain unsaturated fatty acids (SCUFAs) into membrane lipids from various sources, including supplemented culture media and during infections. Given the enhancement of membrane fluidity due to oleic acid (C18:1Δ9) incorporation into lipids and the growth stimulation as a result, we were prompted to examine the effect of medium supplementation with the other SCUFAs such as sapienic acid (C16:1Δ6), palmitoleic acid (C16:1Δ9), linoleic acid (C18:2Δ9,12), arachidonic acid (C20:4Δ5,8,11,14), the triglyceride (trilinolein), and cholesteryl esters (cholesteryl arachidonate and cholesteryl linoleate) on growth at low temperatures. All SCUFAs and trilinolein tested significantly enhanced the growth of S. aureus at low temperatures at low concentrations (<30µM), above which the growth was inhibited. These data suggest that SCUFAs incorporates into phospholipids and glycolipids and enhance membrane fluidity. Cholesteryl esters stimulated low temperature growth and were tolerated to considerably higher concentrations than free fatty acids or triglycerides suggesting a potentially protective role of cholesterol. There was a notable increase in the production of the golden pigment staphyloxanthin, at low temperatures. A carotenoid-deficient mutant strain showed less growth than the parent in response to the different compounds supporting a role for staphyloxanthin in cold adaptation. These findings shed light on the significance of exogenous SCUFAs in S. aureus's adaptation mechanisms to cold temperatures and their impact on bacterial growth and membrane fluidity that is relevant to growth in food environments. It also highlights a potential novel pathway involving a role for cholesterol in S. aureus membrane physiology, where cholesterol has a protective nature which may influence host-pathogen interactions and may affect the susceptibility to various antimicrobial molecules.

USING AN ACOUSTIC CAMERA TO DIFFERENTIATE INDIVIDUAL CONTRIBUTIONS IN DUETS OF NEOTROPICAL WRENS

Presenter(s): Sander, Grant, Undergraduate, Biological Science

Mentor: Dr. Carlos Rodríguez-Saltos

Authorship: Grant Sander, Carlos Rodríguez-Saltos

Many species of neotropical wrens engage in complex duets in which individuals take turns alternating vocalizations with little to no overlap between phrases. The timing is so precise that it often sounds as if a single bird is singing. Both male and female wrens engage in duetting behavior, with duets serving multiple functions, including territory defense, social bonding, and mate acquisition. Given the rapid and seamless alternation of phrases, distinguishing individual contributions within a duet is challenging. To address this issue, we evaluated the efficacy of determining individual contributions to duets with an ACAM-120 acoustic camera. Acoustic cameras employ an array of microphones surrounding a central camera to spatially map sound sources. To test whether the ACAM-120 distinguishes individual contributions, we conducted a controlled experiment using modified recordings of Plain-tailed Wrens (Pheugopedius euophrys), played from two speakers to simulate natural vocal interactions. The acoustic camera was capable of distinguishing multiple audio sources and accurately determining the source of playback on a moment-to-moment basis. These findings suggest that acoustic cameras are an effective tool for analyzing duetting behavior in neotropical wrens. This approach has the potential for broader applications in bioacoustics and behavior research as a tool to isolate individual vocalizations in pair interactions.

USING COMPUTER VISION TO EXPLORE THE LINK BETWEEN BEAK MOVEMENTS AND BIRDSONG IN THE WILD

Presenter(s): Scott, Jadyn, Graduate, Biological Sciences

Mentor: Dr. Carlos, Rodriguez-Saltos

Authorship: Jadyn Scott, Carlos Rodriguez-Saltos

Birdsong is a complex, multimodal behavior crucial for communication and fitness. Song production originates in the syrinx, the bird's vocal organ, then the final acoustic output is filtered through coordinated body movements—such as those of the beak and throat—that modify key song characteristics like frequency and tonality. Despite previous studies on specific species, the relationship between acoustics and body posture remains largely unexplored across taxa. Advances in machine learning and computer vision, particularly DeepLabCut, now enable high-throughput, precise tracking of this biomechanical filtering during song production. Using 159 field-recorded songs and crowd-sourced videos from the Macaulay Library, we applied DeepLabCut to quantify beak gape movements in White-crowned Sparrows. Our analysis revealed a positive correlation between beak gape angle and dominant frequency, mirroring patterns observed in manually-scored videos of related species, White-throated and Swamp Sparrows. These findings suggest a biomechanical constraint or adaptation influencing song filtering, such as beak size or maneuverability. By leveraging DeepLabCut's precise tracking capabilities, this approach will be expanded in future research to analyze a broader range of New World sparrows (Passerellidae), enabling a detailed, data-driven investigation of the evolutionary drivers of song filtering and their role in shaping species-specific vocal traits.

EXPLORING TEMPERATURE RESILIENCE IN CRUSTACEAN NEURAL CIRCUITS: DEVELOPING WESTERN BLOTTING AS A QUANTITATIVE APPROACH FOR NEUROMODULATOR RELEASE

Presenter(s): Seymour, Mackenzie, Graduate, Biological Sciences

Mentor: Dr. Wolfgang Stein

Authorship: Mackenzie Seymour, Wolfgang Stein

Temperature perturbations challenge all levels of physiology, but they are particularly dangerous for the nervous system as neurons rely on temperature-sensitive biochemical and molecular processes to function. Temperature perturbations, and in particular rising temperatures, can cause an imbalance of inhibitory and excitatory conductances in neurons. Consequently, membrane leakage of the neuron increases, leading to abnormal or even cessation of neural activity, which disrupts behaviors important for survival. Possessing compensatory mechanisms is thus vital for animals to counterbalance negative temperature-induced effects on neuronal activity.

Recent research investigating the effects of temperature on the nervous system of poikilotherms (animals whose body temperature relies on the environment) have shown some neural circuits are endowed with an ability to continue functioning despite temperature perturbations, or temperature resilience. This temperature resilience is achieved in part through neuromodulation, where modulatory neurotransmitters released from temperature-sensitive neurons enable neuronal circuits to continue to function at rapidly rising temperatures. Previous research in my lab has shown that the neuromodulator CrustTRP (Crustacean tachykinin-related peptide) enables temperature resilience of a neural circuit in two crab species, the Jonah crab (Cancer borealis) and Dungeness crab (Cancer magister). We hypothesize that CrustTRP is released at a higher rate when temperature increases.

To test this hypothesis and better understand the role of CrustTRP in mediating temperature resilience, we aim to develop Western blotting as a quantitative method to measure its release in response to temperature perturbations. By optimizing Western blotting to specifically detect CrustTRP, we can quantitate its release across different temperature conditions. This will provide valuable insights into how CrustTRP modulates neural circuit function and temperature resilience. Ultimately, these findings contribute to a broader understanding of how neuromodulation can maintain neural stability under environmental stress.

HOW DO HEAT SHOCK PROTEIN GENES RESPOND TO HEATWAVES IN THE CRANIAL REGION OF T. SCRIPTA EMBRYOS?

Presenter(s): Solache, Miranda, Undergraduate, Biological Sciences

Mentor: Dr. Rachel Bowden

Co-Mentor: Dr. Ryan Paitz

Authorship: Miranda Solache, Clinton Warren, Madison Wilken, Rachel Bowden, Ryan Paitz

The embryos of oviparous species such as turtles are vulnerable to various environmental conditions like extreme heat, which can influence embryonic development, hatchling survival, and even sex determination. Elevated temperatures can compromise cellular integrity by inducing protein denaturation, disrupting membrane fluidity, and impairing essential enzymatic activities. To counteract these detrimental effects, turtle embryos initiate protective responses to preserve cellular function under thermal stress. This process involves heat shock proteins (HSPs), a family of proteins that are produced in response to cellular stress such as transient heat. We utilized the red-eared slider turtle (Trachemys scripta) to understand how HSPs respond to heatwaves in the embryonic cranial region. We exposed T. scripta embryos to fluctuating cool temperatures (26 ± 3° C) with the control group remaining at cool temperatures and treatment groups experiencing three 3-day heatwaves (31 ± 3° C) early in development. We are investigating gene expression of 5 HSPs (HSPH1, HSP90B1, HSP70A5, HSP70A5, HSP70A8) in response to the heatwave treatments. Preliminary results show that HSPH1 expression increases during the 3-day heatwave events. We expect that the other HSPs will show similar patterns. These results so far indicate that HSPs in the cranial region may be rapidly induced in response to transient heat exposures, thus representing an adaptive acute heat response. This contributes to our understanding of embryonic resilience to environmental stress during development.

FACULTY PERSPECTIVES ON EQUITY, DIVERSITY, ACCESS, AND BELONGING IN STEM DISCIPLINES

Presenter(s): Soyebi, Blessing, Graduate, Biological Sciences

Mentor: Dr. Rebekka Darner

Authorship: Blessing Soyebi

Despite the proliferation of initiatives on Equity, Diversity, Access, and Belonging (EDAB), STEM disciplines experience several inequities. Disparities continue to be evident in the underrepresentation of certain groups- Black, Indigenous, Latina, and women from historically marginalized and minoritized backgrounds in STEM fields. Additionally, low retention of students in STEM degree programs, especially for these minoritized students, is a national concern.

Notably, only a limited number of institutions of higher learning are addressing this concern by implementing initiatives that promote equity, diversity, access, and belonging (EDAB). This effort is evident in the professional developmental programs that these institutions design to equip faculty with strategies to foster inclusive classrooms. However, faculty perceptions and beliefs facilitate or hinder the implementation of these inclusive practices taught in these programs. Considering the critical position of faculty in shaping classroom climate and student experiences, it is safe to assume that faculty plays a vital role in contributing to students' success in STEM. Thus, faculty perceptions may be a factor that could influence retention rates in STEM fields. Despite this, research exploring faculty perspectives remains limited, potentially leading to disengagement and undermining long-term goals to foster equity, inclusion, and representation in STEM disciplines.

This qualitative study uses semi-structured interviews to investigate the perceptions of STEM faculty at a large Midwestern public institution. We seek to address three key research questions: (1) Does the current STEM climate at the institution align with the goals to foster equity, inclusion, and representation in STEM disciplines? (2) How effective do they perceive current STEM initiatives geared toward equity, inclusion, and representation in STEM disciplines at the institution? (3) What strategies do they employ to provide inclusive classroom instruction? This study has the potential to address these gaps and provide insight to institutional leaders, stakeholders, policymakers, and educators. The findings will be vital in formulating evidence-based strategies to enhance persistence in STEM, promote inclusion, and achieve representation within STEM disciplines.

Keywords: Faculty perspectives, STEM persistence, inclusive teaching, equity, inclusion, under-representation

DOES EXPOSURE TO FREE FATTY ACIDS AFFECT EMBRYONIC DEVELOPMENT

Presenter(s): Wertz, Jessie, Undergraduate, Biological Sciences

Mentor: Dr. Ryan Paitz

When females experience stress during reproductive events, their offspring can be exposed to elevated corticosterone levels. In developing chicken embryos, embryonic exposure to corticosterone results in reduced growth and increased mortality. Corticosterone exposure also induces expression of ACOT13 (an enzyme that hydrolyzes fatty acyl-CoA to produce free fatty acids). The purpose of this study was to determine if embryonic exposure to free fatty acids will have an impact on embryonic development to potentially explain the consequences of high corticosterone levels. We tested the effect of free palmitic acid and free oleic acid on development. The eggs were injected with palmitic acid, oleic acid, or vegetable oil (control) and it was found that there was no significant effect on either fatty acid on development. This led to the conclusion that elevated free fatty acid content in the embryo is not what causes the negative effects of corticosterone levels.

DO YOLK ESTROGENS AFFECT PRIMORDIAL GERM CELL DIFFERENTIATION IN A SPECIES WITH TEMPERATURE-DEPENDENT SEX DETERMINATION?

Presenter(s): Wilken, Madison, Graduate, Biological Sciences

Mentor: Dr. Rachel Bowden

Co-Mentor: Dr. Ryan Pait

Authorship: Madison Wilken, Clinton Warren, Rachel Bowden, Ryan Paitz

During early embryonic development, primordial germ cells (PGCs) originate in the yolk sac and migrate to the gonads where they differentiate into either oocytes (within ovaries) or spermatogonia (within testes). One key difference between spermatogonia and oocytes during embryonic development is that oocytes enter into meiosis, which is thought to be triggered by the local production of estrogens in the ovary that, in turn, initiates meiosis by inducing the expression of Dazl. However, there are other sources of estrogens during development, including maternally derived estrogens present in the yolk, that may also affect PGCs. We used Trachemys scripta, a turtle species with temperature-dependent sex determination (TSD) and known to be sensitive to estrogen exposure, to study how PGCs respond to maternal estrogens. In a previous study we found that Dazl expression was elevated in embryos that were treated with estrogens early in development, but sampling in this study occurred relatively late in development after ovary development had begun. Based on these previous findings, we designed an experiment to see how maternal estrogens affect Dazl expression levels early in development to characterize whether yolk estrogens can affect PGCs prior to any signals from a developed gonad. Preliminary results suggest that maternal estrogens do not induce Dazl expression early in development suggesting PGCs are not sensitive to estrogens until the later stages of development.

THE ROLE OF BODY SIZE IN VOCAL PRODUCTION OF ECUADORIAN HUMMINGBIRDS

Presenter(s): Wolfersberger, Logan, Undergraduate, Biological Sciences

Mentor: Dr. Fernanda G. Duque

Authorship: Logan Wolfersberger, Baruah Padmanav, Fernanda Duque

A common trend seen throughout many taxonomic groups is an allometric relationship between an organism's body size and physical characteristics. Typically, species that are larger in size will develop larger vocal organs that produce lower-pitched vocalizations. Inversely, smaller species develop smaller vocal organs that produce higher-pitched sounds. In these cases, body size can become a reliable predictor of frequency of vocal production. Some species of hummingbirds produce vocalizations with a fundamental frequency greater than 8 kHz, which falls beyond the known hearing capabilities of most birds. Furthermore, our current knowledge of HF vocalizers shows that these species exhibit a wide range of body sizes. Therefore, we are interested in understanding whether hummingbirds, including those that produce HF vocalizations, follow this acoustic allometry. If hummingbirds followed standard allometric trends, then smaller hummingbirds would vocalize at higher frequencies and would be more likely to produce HF vocalizations. Using a publicly available repository, we conducted a detailed acoustic analysis of 621 recordings of 126 species of hummingbirds that occur in Ecuador. Our preliminary analysis using phylogenetic regression to compare body mass to fundamental frequency suggests that there was no correlation between body size and fundamental frequency of vocalizations in this group of birds. This means that factors other than body size influence the production of HF vocalizations in hummingbirds, raising questions about the mechanisms involved in determining their vocal frequencies and how hummingbirds recognize and use HF vocalizations in communication.

REDUCED AROMATIC CHARACTER IN NITRONAPHTHOPORPHYRINS

Presenter(s): Bains, Gursewak, Undergraduate, Chemistry

Mentor: Dr. Timothy Lash

Porphyrins with nitro-substituents may exhibit modified spectroscopic properties and reduced aromatic characteristics. Nitronaphthoporphyrin **1a** was prepared previously and this showed an unusual UV-vis spectrum with two broad weakened Soret bands. This can be attributed to disruption of the pi-system due to resonance contributors such as **2**. Unfortunately, **1a** proved to have poor solubility in organic solvents and it was not possible to characterize the free-base form by NMR spectroscopy. In order to gain insights into the effect of nitro-substituents on the aromatic properties of **1**, two new examples of this system were prepared with n-butyl substituents. 1,3-Dinitronaphthalene was reacted with tert-butyl isocyanoacetate in the presence of the non-nucleophilic base DBU to give a mixture of two nitronaphthopyrroles **3** and **4**, together with a dipyrrolonaphthalene byproduct (structure not shown).

Montmorillonite clay catalyzed condensation of **3** with acetoxymethylpyrrole **5** afforded dipyrrylmethane **6** in excellent yields. The tert-butyl ester protective groups were cleaved with trifluoroacetic acid. Following extraction of the intermediate, the dipyrrole was further condensed with dipyrrylmethane dialdehydes **7a** and **7b** to give, following air oxidation in the presence of zinc acetate, the targeted nitronaphthoporphyrins **1b** and **1c**. The proton NMR spectra showed that the external protons were shifted upfield compared to a naphthoporphyrin lacking the nitro-substituent providing evidence for reduced global aromaticity in these structures. Nickel(II) and zinc(II) complexes **1Ni** and **1Zn** were also prepared and spectroscopically characterized.

SYNTHESIS AND REDUCTION OF 2-NAPHTHYL ISOCYANATE

Presenter(s): Borchardt, Ryan, Undergraduate, Chemistry

Mentor: Dr. Steven Peters

Isocyanates (R-N=C=O) are molecules that are often used in industry to produce polymeric materials, such as polyurethanes. Aryl isocyanates have been found to undergo cyclotrimerizations forming triaryl isocyanurates upon reduction with alkali metals. Triaryl isocyanurates are known to enhance the properties of polyurethanes, making them more commercially effective due to their increased transparency and chemical resistivity. Previously, our research group has performed multielectron reductions of aryl isocyanates in aprotic, polar solvents and found these species form stable biaryl anion radicals. For example, when a solution containing 1-naphtyl isocyanate is reduced with potassium metal we find that 1,1'-binaphthyl anion radical is formed, which can be detected using spectroscopic techniques. We are interested in exploring this chemistry with other aryl isocyanates, such as 2-naphthyl isocyanate. The studies presented here will describe the synthesis of 2-naphthyl isocyanate as well as the results obtained from experiments involving the multielectron reduction of this compound.

SYNTHESIZING MATERIALS FOR RESEARCH ON (5+2) CYCLOADDITIONS

Presenter(s): Brozenec, Rachel, Undergraduate, Chemistry

Mentor: Dr. Andy Mitchell

The purpose of this research was to create materials that can be further used to study (5+2) cycloadditions. The starting material, Maltol, was modified through sequential reactions such as the protection of Maltol, the bromination of the protected Maltol, and then the amination of the resulting bromide. As the reactions were run, the products were examined by Thin Layer Chromatography (TLC), purified by Flash Column Chromatography, and analyzed by ^{1}H and ^{13}C NMR spectroscopy. Overall, these reactions provided a learning experience of various reactions and lab techniques as well as a stock of materials that can be used for further research on (5+2) cycloadditions.

SYNTHESIS OF STRUCTURAL DIVERSITY FROM MALTOL-DRIVEN REARRANGEMENT REACTIONS

Presenter(s): Eifert, Rex, Undergraduate, Chemistry

Mentor: Dr. Andy Mitchell

This study presents a synthetic approach utilizing maltol as a versatile scaffold for (5+2) cycloaddition reactions and complex rearrangements. The method uses sequential transformations, including protection, bromination, and amination, to generate a diverse array of starting materials. By optimizing the conditions for these rearrangements, the study aims to identify the most efficient route for obtaining the rearranged products and explore alternative molecules that could serve as viable precursors. The resulting compounds, with their structural diversity, hold significant potential for applications in the synthesis of complex molecular structures. This approach utilizes various chromatography and NMR techniques in order to ensure the purity and structural characterization of the products.

SINGLE CHAIN MANIPULATION OF SYNTHETIC POLYMERS

Presenter(s): Gautam, Binod, Graduate, Chemistry
Foster, Cayden, Undergraduate, Chemistry

Mentor: Dr. Susil Baral

Authorship: Binod Gautam, Cayden Foster, Susil Baral

Our approach to single-chain manipulation of synthetic polymers is based on Magnetic tweezers (MT) force microscopy. We grow surface-grafted synthetic polymers in situ via ring-opening metathesis polymerization (ROMP) of norbornene-based monomers and tether the other end of the polymer to a magnetic particle. A pair of permanent magnets generate magnetic force to pull the magnetic particle. The force exerted on the polymer is of the order of piconewton (pN), enough to stretch a semiflexible polymer but much smaller than the force required to break a covalent bond. The polymer extension under force is measured by tracking the axial position of the magnetic particle, which is determined by analyzing its optical diffraction patterns under transmission imaging. By changing the force applied to the magnetic particle and measuring the corresponding polymer extension, we generate the force-extension curve. Force-extension measurements are used to extract the single-chain mechanics and rigidity of a polymer using polymer physics models. Our study will provide fundamental knowledge on single-chain conformation and dynamics of various synthetic polymers, which is crucial for developing polymer materials with desired mechanical properties.

REGULATING SURFACE-ENHANCED RAMAN SCATTERING SIGNALS BY THERMO-RESPONSIVE GOLD-POLYMER NANOCOMPOSITES

Presenter(s): Gonzalez, Grace, Undergraduate, Chemistry

Mentor: Dr. Jun-Hyun Kim

Authorship: Grace Gonzalez, Michaela Kirchoff, Garrett Milligan, Blessing Okereke, Jun-Hyun Kim

In this study, we describe a highly simple approach to prepare plasmonic gold nanoparticles (AuNPs) in the presence of a temperature-sensitive poly(N-isopropylacrylamide) particle solution for use as a surface enhanced Raman spectroscopy (SERS) substrate. The formation of the polymer particles is achieved by conventional radical polymerization, followed by the *in situ* integration of plasmonic AuNPs. After examining the structural and physical properties of these nanocomposites as a function of temperature, these materials are then tested as a SERS substrate to improve the detection of organic compounds and heavy metal ions in aqueous solutions. Studying these types of materials could lead to the development of highly sensitivity detection systems for toxic and hazardous species that can be directly applied to on-site and real time environmental analysis.

CONJUGATION AND ANALYSIS OF RANDOM AND SITE-SPECIFIC BIOTINYLATED ANTIBODIES ON STREPTAVIDIN-COATED SURFACES

Presenter(s): Kobulnicky, Trent, Undergraduate, Chemistry

Mentor: Dr. Jeremy D. Driskell

Authorship: Trent Kobulnicky, Emily Beitello, Jeremy D. Driskell

Immunoassays utilizing surface-bound antibodies are ubiquitous in biochemical diagnostics. Antibodies providing high affinity and specificity are central to achieving accurate results in diagnostic antigen tests. However, the effectiveness of surface-immobilized antibodies is diminished by limited stability and improper antibody orientation. With this research, we expound a novel mechanism for stable, oriented conjugation of the F_C antibody region to a target surface through biotin-streptavidin affinity. To accomplish this task, anti-horseradish peroxidase IgG1 antibody (anti-HRP) is biotinylated utilizing microbial transglutaminase (mTG) at one site-specific residue (Q295) on each heavy chain F_C region with the resulting structure being elucidated via SDS- PAGE, western blot, and trypsin digest LC-MS. These targeted, biotinylated antibodies (tBt-IgG) are then immobilized on a streptavidin-functionalized well plate. Surface saturation and antibody orientation is quantified using HRP antigen activity and compared to analogous results from antibodies biotinylated at random lysine residues (rBt-IgG). This procedure will be extended to different surfaces, culminating in tBt-IgG adsorption onto streptavidin-coated gold nanoparticles for versatile assay applications.

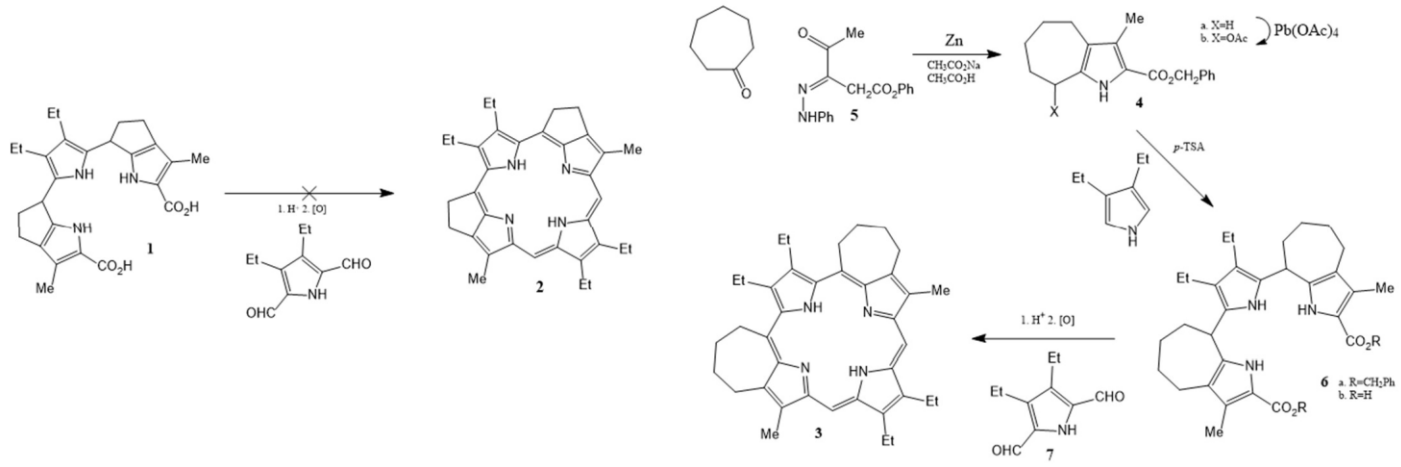
SYNTHESIS OF PORPHYRINS WITH TWO EXOCYCLIC RINGS USING THE Â€˜3+1Â€™ VERSION OF THE MACDONALD CONDENSATION

Presenter(s): Marinucci, Nicole, Undergraduate, Chemistry

Mentor: Dr. Timothy D. Lash

Authorship: Nicole Marinucci, Maiya Forkin, Timothy Lash

Porphyrins are widely investigated due to their potential for applications in numerous areas, including as photosensitizers in photodynamic therapy. Modification of the porphyrin chromophore has been of great interest as this allowed the properties of the system to be altered. In this study, the synthesis of porphyrins with fused exocyclic rings is being investigated. Initially, tripyrrane **1** with two five-membered carbocyclic rings was condensed with a pyrrole dialdehyde, but this failed to produce the targeted diethanoporphyrin **2**. This may have been caused by the tripyrrolic intermediate taking on a conformation that was not conductive to macrocycle formation. An alternative structure **3** with two seven-membered exocyclic rings was targeted instead in an attempt to generate an intermediate that was better suited for porphyrin ring formation. Cyclohepta[b]pyrrole **4a** was prepared by reacting phenylhydrazone **5** with cycloheptanone in the presence of zinc dust in acetic acid. Selective oxidation with lead tetraacetate afforded the corresponding acetoxy derivative **4b** and this was condensed with 3.4-diethylpyrrole in a 2:1 ratio to generate tripyrrane **6a**. Deprotection of the terminal benzyl esters with hydrogen over 10% Pd/C gave the related dicarboxylic acid **6b** and further reaction with dialdehyde **7** afforded the novel porphyrin **3**. It is anticipated that this strategy can be applied to the preparation of a series of porphyrin analogues. Furthermore, it may be possible to synthesize related structures with extended conjugation pathways.



SYNTHESIS AND CHARACTERIZATION OF [Re6Se8(PBn3)4I2] and [Re6Se8(PBn3)5I]I

Presenter(s): Melgoza, Briana, Undergraduate, Chemistry

Mentor: Dr. Lisa Szczepura

Authorship: Briana Melgoza, Lisa Szczepura, Taylor Coil

Transition metal cluster complexes exhibit unique electronic properties and have been found to be important for catalysis and for use in functional materials. This project included various experiments involving the synthesis and purification of *cis*- and *trans*-$[Re_6Se_8(PBn_3)_4I_2]$, from $(Bu_4N)_4$ $[Re_6Se_8I_6]$ and PBn_3 in chlorobenzene. The purified *cis*- or *trans*-$[Re_6Se_8(PBn_3)_4I_2]$ metal cluster was then used for the synthesis of $[Re_6Se_8(PBn_3)_5I]I$ in DMF. All new compounds were characterized using ^{1}H and $^{31}P\{^{1}H\}$ NMR spectroscopy, as well as mass spectrometry and combustion analysis. The next phase of this project involves scaling up on the synthesis of $[Re_6Se_8(PBn_3)_5I]I$ for structural characterization, as well as determining if *cis*- or *trans*- $[Re_6Se_8(PBn_3)_4I_2]$, can be used to prepare clusters with different types of spectator ligands.

OPTIMIZATION OF SYNTHETIC CONDITIONS TO MAXIMIZE THE FLUORESCENT PROPERTY OF GOLD NANOCLUSTERS

Presenter(s): Milligan, Garrett, Undergraduate, Chemistry

Mentor: Dr. Jun-Hyun Kim

Authorship: Garrett Milligan, Blessing Okereke, Michaela Kirchoff, Grace Gonzalez, Jun-Hyun Kim

The properties of gold nanoclusters (AuNCs) are highly affected by many synthetic conditions, making the optimization process demanding. A variety of outcomes can result from a combination of reaction parameters, with the stabilizing ligand playing a major role as they can drastically change the electronic structure of AuNCs. The resulting electronic configuration strongly influences the intrinsic properties of AuNCs such as photoluminescence, magnetism, and catalytic activity. Thus, several synthetic parameters including reaction temperature, pH, illuminating conditions, and thiolate ligand to gold ratios were precisely regulated to determine the effects on the formation of AuNCs and their overall properties. The ability to accurately control these parameters can allow for the fabrication of nanoclusters with high stability and strong photoluminescence, expanding their practical applications such as fluorescent bioimaging and sensing.

APPLICATIONS OF [5+2] CYCLOADDITIONS TOWARDS CLEAVABLE TETHERS

Presenter(s): Nsabaah, Joseph, Graduate, Chemistry

Mentor: Dr. Andy Mitchell

Authorship: Joseph Nsabaah, Andy Mitchell

Cleavable tethers are essential components in various fields, including chemical biology and drug discovery. The [5+2] cycloaddition is a highly efficient and versatile process for forming seven-member rings, a structure in natural products and pharmaceuticals. This [5+2] cycloaddition involves the concerted union of a 5-atom π-system, typically a heterocyclic or a vinyl cyclopropane equivalent and a two-atom π system, resulting in the creation of new bonds and stereocenters. A series of transformations was performed on maltol to synthesize novel derivatives suitable for [5+2] cycloaddition reactions. Initially, maltol was protected with TBDPSCl (tert-butyldiphenylsilylchloride). The protected maltol subjected to bromination, introducing a reactive handle, which was then converted to an amine through substitution. Finally, acylation of the amine yielded a novel derivative bearing a functional group poised for participation in [5+2] cycloaddition reactions. These derivatives are expected to serve as valuable intermediates in the synthesis of complex molecules.

FABRICATION OF CARBON BLACK FOR THE DEVELOPMENTOF HIGHLY REACTIVE SUPPORTED CATALYSTS

Presenter(s): Okereke, Blessing, Graduate, Chemistry

Mentor: Dr. Jun-Hyun Kim

Authorship: Blessing Okereke, Garrett Milligan, Michaela Kirchoff, Grace Gonzalez, Jun-Hyun Kim

This study explores the influence of carbon black (CB)-based support substrates on the catalytic properties of loaded palladium nanoparticles (PdNPs). We have demonstrated the possibility of utilizing recycled carbon black (rCB), derived from scrap tires, as a sustainable alternative to conventional carbon black (CB) in catalytic applications. Building on this finding, the present research aims to assess the catalytic performance of rCB against nitrogen doped carbon nitride (C3N4) as a support material for PdNPs. This graphitic C3N4 can be an easily obtained environmentally friendly materials such as urea and melamine. The resulting substrate is hypothesized to outperform rCB due to its structural and electronic configuration, including crystallinity and lone pair electrons, both of which can significantly influence on the loading efficiency of catalytically active PdNPs and electron-transfer catalytic reactions. Upon simply comparing the catalytic activity of PdNPs supported on rCB and C3N4 in several chemical transformations, this study can elucidate the reasons behind the higher reactivity of graphitic C3N4. This research not only aims to validate the prospective benefits of C3N4 but also seeks to promote the development of green and sustainable catalytic systems.

DETECTION AND LONG-TERM ASSESSMENT OF COVID-19 PHARMACEUTICALS IN SOIL AND THEIR DEGREDATION PATHWAYS

Presenter(s): Piontek, Russell, Graduate, Chemistry

Mentor: Dr. Christopher Mulligan

Authorship: Russell Piontek

At the onset of the COVID-19 pandemic, an assortment of pharmaceutical drugs garnered mainstream prominence (e.g., hydroxychloroquine sulfate, dexamethasone, ribavirin, etc.). It is well documented that pharmaceuticals can end up in the environment by several different pathways, including manufacturing waste, improper disposal, and human excretion. Once in the environment, there are many potential areas they may impact, including: entering aquatic regions and contaminating aquatic organisms, infecting local plant and animal life via water to soil contamination, and reintroduction to humans by interaction with contaminated soil or consumption of infected wildlife.

Electrospray ionization mass spectrometry (ESI-MS) provides a rapid means of analysis for soil samples. Using ESI-MS, soil samples spiked with varying degrees of pharmaceutical drugs can be detected at very low concentrations, very quickly, and at a high resolution. ESI-MS is also very versatile as it is easily modifiable depending on the needs of the researcher. Here a three dimensionally printed cone using carbon nanotube-infused polymers are utilized for detection of COVID-19 pharmaceuticals under ambient conditions. Utilizing these cones, methods are then developed for the detection of each given pharmaceutical.

How these pharmaceuticals interact and breakdown in soil is also of interest. Spiking biologically active soil samples with these COVID-19 pharmaceuticals and then analyzing them over time lends insight into whether the drugs are detectable in soil, how long they stay in their native form, and with what rapidity they experience breakdown or fragmentation. Even if the drug is partially broken down in soil, this breakdown information is significant because the molecular fragments can be utilized to infer the presence of the drug in an environmental sample as the fragmented molecules are unique to theunfragmented molecule. Additionally, each drug is unique in that the fragmentation biproducts may be more or less undesirable in their fragmentated state versus their native state. Analysis of these degradation pathways will better inform us all about how long these drugs are expected to retain their native state in soil, how and if any breakdown occurs, and whether or not the fragmented molecules carry any toxic features of note.

THE ARG-N-DEGRON PATHWAY COUNTERACTS THE PRO-APOPTOTIC TRUNCATED BAX VIA PROTEIN DEGRADATION

Presenter(s): Shahid, Michael, Undergraduate, Chemistry
Homan, Grace, Undergraduate, Biological Sciences

Mentor: Dr. Mohamed Eldeeb

Authorship: Michael Shahid, Grace Homan, Mohamed Eldeebr

The Arg-N-degron pathway targets destabilizing N-terminal residue-containing protein substrates for Ubiquitin-dependent proteasomal degradation. It is shown that this pathway plays crucial roles in cardiovascular development, G-protein signaling apoptosis and genomic stability. In the course of Arg-N- degron-mediated protein degradation, Arg-N-degron- E3 ubiquitin ligases promotes protein degradation through the recognition of destabilizing N-terminal residues such as N-terminal arginine on target proteins. Upon apoptosis in various mammalian cell lines, Bax is cleaved by proteases to generate a pro- apoptotic Cleaved fragment of BAX that has a destabilizing N-terminal aspartate. While several studies demonstrated the potent pro-apoptotic activity of Bax, the biochemical regulation of the metabolic stability of this pro-apoptotic fragment has been elusive. Herein, we identify that the cleaved pro- apoptotic fragment of Bax is a novel substrate for Arg-N-degron degradation machinery. Tellingly, our data support the notion that Arg-N-degron degradation machinery may represent a potential therapeutic target to modulate apoptosis in cancer cells.

SURFACE INTERACTIONS BETWEEN HALOGENATED AROMATIC COMPOUNDS

Presenter(s): Sheehan, Casey, Undergraduate, Chemistry

Mentor: Dr. Bhaskar Chilukuri

Aromatic compounds and their halogenated analogs have unique interactions with surfaces. My research has been particularly focused on triphenylene (an aromatic compound) and its brominated and chlorinated analogs. Over the span of my research, I have utilized scanning tunneling microscopy to get images of these molecules adsorbed on a surface, usually one of highly ordered pyrolytic graphite (HOPG). Aside from imaging the molecules on the surfaces, I also used quantum mechanical models to predict the adsorption characteristics of these molecules with the surface. I also applied UV-visible spectroscopy to characterize each of these different molecules in solution to verify their identity and determine the properties dependent on concentrations.

CAN I COPE: LANGUAGE BARRIERS AND ACADEMIC STRESS EXPERIENCES AMONG INTERNATIONAL GRADUATE STUDENTS AT ILLINOIS STATE UNIVERSITY

Presenter(s): Adeyemo, Grace, Graduate, Communication

Mentor: Dr. Andrew Ventimiglia

Authorship: Grace Adeyemo

Globalization and advancements in digital media technologies have encouraged international students to pursue academic opportunities abroad. Scholars recognize international students as valuable contributors to diversity on American campuses, as they often share experiences that promote cultural integration and appreciation during class discussions. However, they also face significant challenges, particularly language barriers, which can impact their academic experiences. While prior research has examined international students' challenges, limited attention has been given to how language barriers contribute to academic stress among international graduate students in the United States, particularly at Illinois State University (ISU), which hosts a significant number of international graduate students. This study fills this gap by examining the role of language barriers in shaping academic stress experiences among international graduate students at ISU. Communication Accommodation Theory (CAT) which explains why and how individuals adjust their speech patterns during social interaction, and what social consequences result from such adjustment serve as a framework. A qualitative approach that combines Focus Group Discussions (FGD), In-depth Interviews (IDI), and Key Informant Interviews (KII) was employed. Findings reveal that accent differences, speech rates, slang, and variations between British and American English are the primary language challenges faced by international graduate students at ISU. These barriers contribute to academic stress, as students struggle to keep up with and adapt to American classroom expectations. To cope, students modify their pronunciation and rely on peer networks for support. However, the study found that institutional support for language barriers is often underutilized. While ISU provides academic tutoring, peer mentoring, and faculty office hours, many students do not access these resources due to lack of awareness, cultural barriers, or intimidation in seeking help. Moreover, the study found that students and professors negotiate accommodation through convergence as they adjust their speech for clarity inside and outside the classroom. To create a more inclusive academic environment, universities should implement faculty training on language accommodation, promote awareness of academic support services, and establish structured classroom participation policies that support diversity.

THE ROLE OF MESSAGE FRAMING IN INFLUENCING HEALTH DECISIONS AMONG INTERNATIONAL GRADUATE STUDENTS AT A MIDWEST UNIVERSITY IN THE UNITED STATES OF AMERICA

Presenter(s): Amissah, Beatrice, Graduate, Communication

Mentor: Dr. John R. Baldwin

International graduate students in US universities face numerous challenges in the quest to attain higher education while navigating an environment far from home. While significant research has addressed the mental and physical health needs of these students, little attention has been given to how they respond to health messages based on framing, especially within the context of cultural differences. As the United States continues to serve as a prominent destination for international students, it has become increasingly important to address health message framing to meet their unique needs and influence their health-related decisions effectively. This qualitative study explores the impact of message framing on the health decisions of international graduate students at a Midwest university in the United States. Using semi-structured, in-depth interviews with ten participants, the study reveals that the framing of health messages plays a crucial role in how international students perceive and process such messages. Participants expressed a preference for health messages emphasizing potential benefits (gain-framed) over those highlighting potential losses (loss- framed). Additionally, the study found that certain health messages were perceived as irrelevant due to cultural differences between the United States and the participants' home countries.

Key terms: Message framing, international graduate students, health decisions.

EFFECTS OF MULTITASKING DURING INTERPERSONAL VIDEO CHATS

Presenter(s): Edema, Clementina, Graduate, Communication
Merkling, Matt, Graduate, Communication
Niftulaeva, Alina, Graduate, Communication

Mentor: Dr. Caleb Carr

Co-Mentor: Dr. Aimee Miller-Ott

Authorship: Clementina Edema, Matthew Merkling, Gabriela Gomes, Alina Niftulaeva, Caleb Carr, Aimee Miller-Ott

Even when engaged in synchronous dyadic video chats, individuals can be distracted from their communication partner. Drawing on the concept of crosstalk in face-to-face interactions, two studies explored the impact of a video chat partner's distraction on perceptions of that partner's social attractiveness, electronic propinquity, conversational immediacy, and social presence. The first study (N = 40) used a survey to have respondents recall and describe three specific prior social dyadic video chats (i.e., dyadic, dual front mediated crosstalk, collective mediated crosstalk), and then provide metrics of study variables for each episode and partner. The second study (N = 87) used an online experiment to expose participants to one of three video chat vignettes in which one partner engaged in one of three forms of crosstalk. Results extend the concept of crosstalk into fully-mediated interactions, evidencing lower perceptions of conversational characteristics (i.e., electronic propinquity, conversational immediacy, social presence) as dyad partners were more distracted away from the video chat, though relational perceptions of the partner (i.e., social attractiveness) remained generally stable.

FAMILIAL POLITICAL DISCOURSE: A LOOK INTO MANAGING POLITICAL DIFFERENCES WITHIN THE FAMILY

Presenter(s): Mueller, Kate, Graduate, Communication

Mentor: Dr. Lindsey Thomas

This study examines how Reddit users discuss how their family communication patterns, and relationship closeness was affected by political discourse surrounding the 2024 election with their assumed close family members. Using a thematic analysis to look at a Reddit thread three major themes were found: conflict escalation and relationship strain, perceived betrayal and value misalignment, and avoidance as a communication strategy. Findings revealed that political disagreements frequently led to heightened arguments, emotional exhaustion, and sometimes estrangement within families. Many individuals expressed using avoidance to preserve emotional well-being, challenging established communication patterns and harming relationship closeness. Taking a closer look at this topic provides insight into navigating family relationships in a time of high political polarization.

THE IMPACT OF INTRODUCTORY PUBLIC SPEAKING COURSES ON STUDENT RETENTION IN HIGHER EDUCATION

Presenter(s): Murray, Taylor, Graduate, Communication

Mentor: Dr. Cheri Simonds

Co-Mentor: Dr. Stephen Hunt

This study examines how Reddit users discuss how their family communication patterns, and relationship closeness was affected by political discourse surrounding the 2024 election with their assumed close family members. Using a thematic analysis to look at a Reddit thread three major themes were found: conflict escalation and relationship strain, perceived betrayal and value misalignment, and avoidance as a communication strategy. Findings revealed that political disagreements frequently led to heightened arguments, emotional exhaustion, and sometimes estrangement within families. Many individuals expressed using avoidance to preserve emotional well-being, challenging established communication patterns and harming relationship closeness. Taking a closer look at this topic provides insight into navigating family relationships in a time of high political polarization.

PREDICTIVE POLICING AND AI BIAS: CAN MACHINE LEARNING MODELS BE MADE FAIR?

Presenter(s): Nguyen, Han, Undergraduate, Information Technology

Mentor: Prof. Shanna Carlson

Authorship: Han Nguyen, Shanna Carlson

Artificial intelligence is increasingly used in law enforcement, with predictive policing models claiming to enhance crime prevention. However, these systems often inherit and amplify biases from historical data, disproportionately impacting marginalized communities. This research examines whether machine learning algorithms can be trained to mitigate bias while preserving predictive accuracy. Using real-world crime datasets, we develop a PyTorch-based predictive policing model, applying fairness-aware training techniques such as adversarial debiasing, reweighting, and bias-regularized loss functions and measure their impact. This study highlights the technical and ethical limitations of debiasing methods and raises critical questions about the role of AI in criminal justice.

NAVIGATING CRISIS COMMUNICATION: HOW UNDERGRADUATE STUDENTS PERCEIVE UNIVERSITY RESPONSE DURING CAMPUS EMERGENCIES

Presenter(s): Obiri, Alfred Kwabena, Graduate, Communication

Mentor: Dr. John Baldwin

This study looks at how undergraduate students perceive and respond to university crisis communication during campus emergencies. The study takes a qualitative approach and investigates participants' experiences with institutional messaging, focusing on their preferences, problems, and the emotional impact of communication strategies. Semi-structured interviews with seven students showed themes such as the value of transparency, peer-driven safety measures, and the effect of location-specific clarity on message efficacy. The findings emphasize the dual nature of digital communication, in which rapid updates can both comfort and increase worry, as well as the importance of addressing equity and access disparities in digital platforms. Based on Situational Crisis Communication Theory (SCCT), the study emphasizes the need of adapting crisis communication to meet stakeholder demands and perceptions. These insights contribute to understanding effective strategies for fostering trust and engagement during campus emergencies.

Keywords: crisis communication, higher education, student perceptions, situational crisis communication theory (SCCT)

STUDENTS' PERCEPTIONS OF TEACHER-STUDENT RELATIONSHIPS AND HOW THESE RELATIONSHIPS MOTIVATE STUDENTS

Presenter(s): Pappoe, Deborah, Graduate, Communication

Mentor: Dr. John Baldwin

This study investigated students' perceptions of teacher-student relationships and how these relationships motivate students in the classroom. Bowlby's (1979) attachment theory was used to explain how teacher- student relationships are developed and the form they take (positive or negative). The study uses in-depth interviews from a purposive sample of ten college students exploring how teacher-student relationships affect student motivation, particularly emphasizing communication styles, classroom environment, and the influence of positive and negative interactions. Thematic analysis of the interviews resulted in three themes: positive and negative teaching methods, the impact of teacher-student relationships on academic motivation, and out-of-class communication. The study offers insights into the nuances of teacher-student relationships and their impact on academic motivation in college classrooms.

PUBLIC RELATIONS CAMPAIGNS: STATE OF THE FIELD

Presenter(s): Quick, Alexis, Graduate, Communication

Mentor: Dr. Rebecca Hayes

Authorship: Alexis Quick, Rebecca Hayes, Maddie Wilson, Kate Mueller, Taylor Murray, Miriam Wolff

The public relations (PR) industry has evolved significantly in the past 10 years, but the instructional model for the capstone "campaigns course" has not. The same models and methods of campaign development have been emphasized for at least the past 25 years, with the RACE and ROPE models dominant. It is unknown whether those models actually map to current PR practice. This study, through in-depth practitioner interviews (N = 19) seeks to update understanding of how campaigns are developed across various PR settings. This knowledge informs recommendations for improving campaigns classes and strengthens academic-industry relationships.

Method

In-depth, semi-structured interviews were conducted with PR practitioners from different sectors (agency, corporate, non-profit, institutional), and transcripts were analyzed for emerging themes.

Results and Discussion

Key themes emerged, showing that while no universal framework exists, common approaches were identified. The themes identified are as follows:

Theory vs. Practice in Campaign Models: Professionals are aware of PR models (e.g., RACE, ROPE) but rarely use them explicitly. These frameworks serve as general guides for campaign stages but are adapted informally in practice.

Client-Centric Adaptations: Practitioners often adjust their approaches based on client needs, which may not align with textbook strategies. For instance, communicating complex models to clients is seen as impractical, prompting professionals to simplify ideas to fit client perspectives.

Collaborative and Iterative Development: Campaign development is a collaborative, iterative process with ongoing feedback from stakeholders, and does not follow the step-by-step approach of models.

Importance of Foundational Planning: Setting clear goals, identifying key audiences, and conducting preliminary research were emphasized as foundational steps in PR campaign planning. Professionals prioritized understanding the target audience, assessing what has worked in the past, and defining clear, measurable goals to ensure strategic direction.

Practical Use of Business Frameworks: Concepts such as the SMART approach (specific, measurable, achievable, realistic, and time-bound) were often cited as practical tools for campaign planning, offering a concrete method for setting and measuring goals. Though PR-specific models may not be followed explicitly, these tools provide a foundation for effective strategy formulation, and one better understood by non-PR clients and partners.

Implications for the campaigns course are varied. As the discipline of PR is further integrated with other promotional functions, the value of standalone PR campaigns models may be lessened and focus should be instead given to more general business models, such as SMART, to facilitate cross-area collaboration.

CHOOSING BOOKS: PERCEPTIONS OF AVID READERS

Presenter(s): Reimers, Mackenzie, Graduate, Communication

Mentor: Dr. John Baldwin

Authorship: Mackenzie Reimers

Books are still a popular form of entertainment young people pursue even after they are required to for school. BookTok is a rising platform where readers are getting their recommendations and having conversations about books. The rise in book bans and need for diverse representation in media informs this study. To understand the reasons people read and what informs their reading decisions, Uses and Gratifications Theory is used as a theoretical framework. Eight avid readers participated in semi-structured interviews that were examined using thematic analysis. The findings were grouped into three main categories: reading habits, reading choices, and reading motivations.

FOLLOWING THE RULES? CASE STUDIES IN TECH INDUSTRY LAYOFFS

Presenter(s): Roiland, Haley, Graduate, Communication

Mentor: Dr. Pete Smudde

Co-Mentor: Dr. Rebecca Hayes

This study examines the handling of recent layoffs at Twitter, now X.com, and Meta. It analyzes how the layoffs and the reasoning for them are framed when announced to internal publics and the media. The study utilizes thematic analysis of media coverage, company documents, and publicly available employee and public reaction in traditional and social media. A model for communicating layoffs based on the nature of the layoffs and organizational dynamics developed by Smeltzer and Zener (1994) is the basis for the analysis. Expected key findings should address the commonality in the framing of layoffs within the industry and showcase how the Twitter layoffs lacked many elements of the model and will compare and contrast the recent Meta layoffs. The differences in resulting controversy among employees and external publics and may be an outcome Twitter not following recommended models and communication processes for layoffs. Improper handling of organizational change can negatively impact an organization and its employees, so it is important to analyze and learn from past events that may have been mishandled.

THE WEAPONIZATION OF REALITY: A RHETORICAL ANALYSIS OF AN AI-GENERATED TRUMP DEEPFAKE

Presenter(s): Wolff, Miriam, Graduate, Communication

Mentor: Dr. Joseph Zompetti

Authorship: Miriam Wolff

This rhetorical analysis examines an AI-generated political deepfake featuring Donald Trump with Black supporters, posted on Facebook by a conservative talk show host. Using Critical Discourse Analysis (CDA), this study interrogates the interplay of visual and textual elements within the synthetic image and its accompanying Facebook post to explore how AI-generated content can be weaponized exploit racial tensions, political divisions, and traditional family values. This analysis reveals how confirmation bias, motivated reasoning, and persuasive appeals—including pathos, ethos, and kairos—contribute to the deepfake's persuasive power. Additionally, this study considers the broader implications of AI-driven disinformation, particularly its potential to erode public trust in media, manipulate electoral discourse, and amplify polarization. This study underscores the evolving role of deepfakes in digital persuasion, emphasizing the need for ethical considerations in the age of AI-generated disinformation.

EXECUTIVE FUNCTIONS AND MEMORY PROCESSES IN OLDER ADULTS WITH MILD HEARING LOSS

Presenter(s): Beilstein, Kathryn, Undergraduate, Communication Sciences and Disorders
Turner, Juliana, Undergraduate, Communication Sciences and Disorders
Kirkham, Camryn, Graduate, Communication Sciences and Disorders
Cavanagh, Grace, Graduate, Communication Sciences and Disorders

Mentor: Dr. Shraddha Shende

Authorship: Kathryn Beilstein, Juliana Turner, Camryn Kirkham, Grace Cavanagh, Shraddha Shende

Current research has identified age-related hearing loss (ARHL) as a modifiable risk factor for dementia. Consequentially, the relationship between hearing loss and cognition warrants further investigation. To date, studies have thoroughly examined a few cognitive functions, including attention and speed of processing. However, a comprehensive examination of various cognitive functions, including executive function and memory, has not been explored in older adults with mild to moderate ARHL. To address this gap, the current study examined executive functions and memory processes, specifically working memory and semantic memory in 20 older adults. Specifically, 10 older adults with mild hearing loss (OAMHL) and 10 older adults with normal hearing (OANH), all aged >55 years, were included in the study. We also determined participants' perceived Listening Effort, using an Effort Assessment scale. To assess executive function performance, the National Alzheimer's Coordinating Center Trail Making Test (TMT) Parts A and B and the Delis-Kaplan Executive Function System (D-KEFS) Stroop Task were administered. Additionally, the National Alzheimer's Coordinating Center Forward and Backward Digit Span tests were administered to assess working memory performance. To assess semantic memory, the D-KEFS verbal fluency tests were administered to evaluate the ability of participants to recall words within a given category. Analyses of the data are ongoing. Results will be presented at the time of the symposium.

DEMOGRAPHICS OF PEDIATRIC DYSPHAGIA IN A TERTIARY HOSPITAL IN SOUTH KOREA

Presenter(s): Churchey, Jenna, Undergraduate, Communication Sciences and Disorders

Mentor: Dr. Taeok Park

Authorship: Jenna Churchey, Taeok Park

Dysphagia is a medical diagnosis meaning swallowing difficulty. A compromised swallowing process greatly impacts feeding and nutritional intake, which inhibits pediatric growth and development. Since the prevalence of dysphagia diagnoses within the pediatric population has been increasing, research is critical to understanding pediatric dysphagia. The purpose of this study was to examine the demographic characteristics of pediatric patients with dysphagia including etiologies and management through tube feeding. Moreover, the study investigated the presence of oropharyngeal dysphagia and aspiration through videofluoroscopic swallow studies (VFSS). The cross-sectional study was conducted between January 2011 and December 2018 at Seoul National University Hospital. The medical records of 200 patients who were referred to the VFSS, aged from 0 to 5-years-7-months, were utilized to analyze demographic characteristics, frequent etiologies, rates of dysphagia diagnoses, presence of aspiration, and prevalence of tube feeding as the method of nutritional intake. In the results, the most frequent etiologies were neurological disorders (37%.0%), genetic conditions (24.5%), and a mix of etiologies (18.0%). Other etiologies were anatomical abnormalities related to swallowing (5.5%) and cardiorespiratory disorders (8.0%). Further, 7.0% of patients were diagnosed with dysphagia without a medical diagnosis. From the VFSS data, dysphagia diagnoses predominated (81.5%), and the majority of the patients did not aspirate (61.0%). Further, a significant amount of the population was reliant on tube feeding for nutritional intake (45.5%), and another portion of the population was partially by mouth and tube feeding (14.0%). The cases of pediatric dysphagia are intricate due to complicated etiologies, comorbidities, and challenges as well as the high prevalence of tube feeding as the method for nutritional intake. Their etiology is often accompanied by other difficulties such as poor motor skills and cognition. Interdisciplinary team approaches are vital for gaining a well-rounded understanding of diagnoses and intervention strategies.

EXPLORING THE INTERSECTION OF ART, TECHNOLOGY, AND NATURE: THE WORK OF HAYK ZAKOYAN

Presenter(s): Akter, Tonmoy, Graduate, Creative Technologies

Mentor: Kristin Carlson

Authorship: Tonmoy Akter

The multifarious artistic path of eminent Yerevan, Armenia artist Hayk Zakoyan is investigated in this paper. Deeply attached in his Armenian background and motivated by the natural environment, Hayk's work is known for its creative mix of art, technology, and music. Hayk deftly combines sound, images, and emotions as a Media Artist, Visual Artist, NFT Artist, Lighting Designer, and Music Composer to provide immersive and provocative events. The paper explores Hayk's early inspirations, his change from visualizing soundscapes to creating dynamic visual representations, and his use of cutting-edge technology including Python, GLSL, and proprietary sound analysis tools. It also looks at his unique grayscale palette and lighting design experience, which turns live events into mesmerizing visual extravaganz. By conducting a comparison examination with other modern artists such as Mikael Alafriz, the paper emphasizes the special features of Hayk's work and his contributions to the modern art scene. Hayk asks viewers to interact personally with his artwork by reinterpreting natural events via an abstract lens, therefore providing a fresh viewpoint on the beauty and complexity of nature.

THE LIFE OF AN ENGINEER (GERALD LAWSON)

Presenter(s): Cousin, Jaden, Undergraduate, Creative Technologies

Mentor: Dr. Jody Decremer

Gerald Lawson is the developer of Channel F, the very first console ever created. Along with being the first console that changed the video game world completely. The Fairchild was the very first console to ever use a cartridge and because of this creation such systems we know today like the Xbox and PlayStation were developed. His creation gifted inspiration onto those who inspire to make games a blessed those who always had to travel to play games the gift of just staying home and playing it on their TV or Mini system in their hands.

A BOARD GAME APPROACH TO CLIMATE CHANGE EDUCATION AND ADVOCACY

Presenter(s): Islam, Jubair, Graduate, Creative Technologies

Mentor: Kristin Carlson

Climate change is a critical global challenge that demands urgent and collective action. Despite widespread awareness, a significant gap persists between understanding the issue and taking meaningful steps toward mitigation. "EcoQuest," a purposefully designed board game, addresses this gap by leveraging gamification to educate and inspire players about climate change. Through immersive gameplay, players engage with real-world scenarios, explore interconnected environmental challenges, and develop an action-oriented mindset. This research investigates EcoQuest's effectiveness as an educational tool, analyzing its components, mechanics, and impact on players' awareness and motivation. Using qualitative methods— including pre- and post-gameplay questionnaires and ethnographic observations—the study assesses changes in participants' knowledge, engagement, and attitudes. Preliminary findings reveal that EcoQuest not only introduces essential climate change terminology and concepts but also fosters deeper understanding and empathy. Players reported heightened motivation to adopt sustainable practices and advocate for systemic change. These results underscore the potential of gamified approaches like EcoQuest to bridge the perception-action gap and catalyze broader participation in climate advocacy. This study contributes to the growing discourse on gamification in education, offering innovative pathways to address one of the most urgent issues of our time.

ENHANCING CLIMATE CHANGE AWARENESS IN CHILDREN THROUGH AUGMENTED REALITY: A STUDY ON EDUCATIONAL ENGAGEMENT

Presenter(s): Islam, Jubair, Graduate, Creative Technologies

Mentor: Kristin Carlson

Co-Mentor: Annie Sungkajun

As the need to address climate change becomes more urgent, introducing children to environmental conservation has become increasingly important. This thesis explores how augmented reality (AR) technology can turn traditional storytelling into an exciting and educational experience to help children learn about climate change. *Sam and Mia's Earth-Saving Adventure*, a 10-page graphic storybook enhanced with AR, allows children aged 3-10 to interact with the story through animations, sound effects, and quizzes that respond to their choices. Developed using Adobe Aero, the book creates an immersive and fun way for children to engage with environmental topics.

The study will employ a combination of methods: ethnographic observations will capture children's engagement during AR interactions, and their performance in a quiz will be quantitatively analyzed to measure comprehension and retention. While the research is still in progress, the study aims to explore how AR-infused storytelling can captivate young learners and enhance their understanding of climate concepts. The goal is to assess whether children demonstrate excitement, curiosity, and an improved ability to recall and apply environmental lessons from the story.

By combining immersive technology with playful education, this study seeks to provide insights into innovative approaches for early childhood learning, emphasizing the potential of AR to inspire a generation of environmentally conscious individuals.

ADVANCING GENDER EQUALITY AND EMPOWERING WOMEN IN STEM IN LATIN AMERICA

Presenter(s): Olaya Karen, Graduate, Creative Technologies

Mentor: Dr. Kristin Carlson

Authorship: Karen Olaya

Women across Latin America are making significant strides in STEM fields, yet structural and cultural challenges continue to limit their full participation. Gender stereotypes, unequal access to education, and limited mentorship opportunities create barriers that affect women's advancement in science, technology, engineering, and mathematics. This research explores these challenges and highlights successful initiatives across the region that are fostering inclusion and empowerment. By examining education reforms, mentorship programs, and policy interventions, this study identifies effective strategies to increase female participation in STEM. Strengthening professional networks, promoting equitable hiring practices, and addressing societal biases will help create a more inclusive and innovative STEM workforce. This research contributes to the ongoing efforts to advance gender equality and offers practical recommendations for educational institutions and policymakers seeking to support women in STEM across Latin America.

MOVEMENT FREEDOM EXPLORATION EXPERIENCE

Presenter(s): Villalobos, Samuel, Undergraduate, Creative Technologies
Tunberg, Michael, Undergraduate, Creative Technologies
Sears, Nicholas, Undergraduate, Creative Technologies
Wanda, Devin, Undergraduate, Creative Technologies

Mentor: Dr. Greg Corness

The Movement Freedom Exploration Experience (MFEE) looks at the building of a customizable low-cost full body movement controller for application in games, simulations, and other digital environments. The focus of this project lies in two aspects of the concept of freedom. First, we are interested in the idea of using free full body motion to control movement in a virtual environment. This has been developed as a commercial product; however, we are interested in the ability to customize such controllers to reflect our own game designs.

Second, we are interested in working to develop a template for others to create this type of controller. We want to show that no matter the project, if a small group of people can start a project together then anything, even a wide scale custom controller on a budget, is possible. The project shows the possibility for small development teams to explore the relationship between the mechanics of the game and the design of custom controllers. We are exploring this area to show that anyone with the right motivation can accomplish this goal of making a custom controller.

FOSTER CARE TO PRISON PIPELINE

Presenter(s): Bottom, Gianna, Graduate, Criminal Justice Sciences

Mentor: Prof. Ashley Farmer

The foster care to prison pipeline is the phenomenon where individuals who have experienced foster care are disproportionately put at risk for interacting with the criminal justice systems. Many factors such as instability, trauma, and lack of support systems are commonly faced by youth in foster care and increases the chances of behavioral and emotional challenges for these individuals. These different challenges are often also combined with systemic inequalities such as racial and socioeconomic disparities. This can lead to higher arrest rates, detention rates, and incarceration rates among foster youth. The foster care to prison pipeline is able to highlight the need for reform in both the foster care and criminal justice systems. Gaining insight from experienced individuals of foster care is essential in aiming to provide more adequate mental health services, education, and resources that prevent foster youth from becoming involved in the criminal justice system and perpetuating the foster care to prison pipeline phenomenon.

ENGLISH

BRIDGING VOCABULARY INSTRUCTION AND ASSESSMENT IN GHANA'S WASSCE

Presenter(s): Neequaye, Ishmael, Graduate, English

Mentor: Prof. Kristina Lewis

The West African Senior Secondary Certificate Examination (WASSCE) is a high-stakes exam administered across five English-speaking West African countries: Ghana, Nigeria, Gambia, Sierra Leone, and Liberia. In Ghana, the WASSCE English paper, written by Senior High School (SHS) students, serves as a crucial gatekeeper for higher education.

For over a decade now, students' performance in the English paper has been described as "not good enough" or "below expectation" by Chief Examiners' Reports (2013, 2020, 2021), with multiple reports suggesting that students' limited vocabulary knowledge may be a causal factor (Chief Examiner's Report, 2011–2021). Despite this claim, there is a dearth of scholarship on vocabulary acquisition in Ghana or on factors influencing students' performance in the WASSCE. As a former WASSCE candidate and English Language Teacher, I am motivated to conduct research that delves into these issues, bridging the gap between assessment practices and teaching methodologies, with implications that extend beyond Ghana to other multilingual and exam-centric contexts.

Thus, in my ongoing MA thesis, I use qualitative methods to examine how Ghanaian SHS English Language Teachers prepare students to meet the vocabulary demands of the WASSCE and how the exams inform their instructional practices. To investigate the interplay between exam-driven teaching and the broader goals of language education in a globalized, multilingual context, I utilized two theoretical frameworks: Communicative Competence and Multiliteracies. In addition to grammatical, sociolinguistic, discourse, and strategic competencies, the Multiliteracies Framework provides an expanded perspective, emphasizing cultural, linguistic, and multimodal diversity in literacy practices.

My preliminary findings suggest that the exam emphasizes traditional vocabulary breadth (e.g., synonyms, antonyms, and contextual word use), with limited integration of multimodal or culturally diverse literacy practices. The teachers I have interviewed report focusing on test-taking strategies and surface-level vocabulary knowledge, often at the expense of deeper and more comprehensive literacy development. This disconnect between multiliteracy principles and the impact and focus of the WASSCE raises important questions about how pedagogical practices can better prepare students for both high-stakes exams and real-world communication.

In this presentation, I will share my preliminary findings. Symposium attendees will: (1) gain insight into the specific vocabulary demands of the WASSCE; (2) explore challenges teachers face in aligning instruction with assessment demands; and (3) discuss strategies for integrating multiliteracies into

vocabulary instruction to balance exam preparation with holistic language development. This research seeks to provide practical recommendations for improving equitable and effective language teaching in high-stakes settings.

FAMILY AND CONSUMER SCIENCES

SIZE MATTERS: AN ANALYSIS OF SIZING OF WOMEN'S JEANS ACROSS 96 BRANDS

Presenter(s): Schunke, Ellie, Undergraduate, Family and Consumer Sciences

Mentor: Dr. Yoon Jin Ma

This study explores the sizing of denim jeans across popular women's fashion brands, focusing on how these brands are addressing body diversity, inclusivity, and accessibility in their jean offerings. The fashion industry, particularly the denim category, has seen a rising demand for more inclusive sizing options in recent years. It is critical to assess how brands are catering to the needs of women of various body types. Traditional sizing systems have overlooked the diversity of women's shapes and sizes. Although brands are starting to respond to this demand, many still struggle to provide a wide range of sizes that fully accommodate diverse body types. With limited sizing systems failing to represent all body types, challenges are created for women who do not fit into the narrow categories of "regular" sizes. This can lead to dissatisfaction and exclusion, and even cause body image issues. With inclusivity becoming a key concern, it is important to understand whether brands' sizing practices reflect the diversity of their consumer base. Therefore, this study aims to provide insights into how brands are responding to sizing needs by evaluating size ranges, body type offerings (petite/plus), and inseam lengths (short/tall). The data was drawn from YouGov's "Most Popular Clothing & Footwear Brands," which ranks clothing and footwear brands based on consumer popularity in Q4 2024. From their initial pool of 196 brands, the focus was narrowed to 96 brands that offer women's jeans, and their size charts were thoroughly analyzed. The findings will shed valuable insights into how brands can improve inclusivity, providing a guideline for making denim more accessible and empowering for women of all shapes and sizes.

CONTENT ANALYSIS OF THE PORTRAYAL OF GENDER ROLE THROUGH DRESS AND ACTIVITIES IN CHILDREN'S LITERATURE ACROSS DECADES

Presenter(s): Schunke, Ellie, Undergraduate, Family and Consumer Sciences

Mentor: Dr. Yoon Jin Ma

More recent children's books show a shift toward diverse gender expressions, with characters of all genders wearing a wider range of clothes and engaging in various activities. This study explored how gender stereotypes are depicted in children's picture books from the 1930s to the 2020s, focusing on the relationship between clothing, activities, and gender roles. By analyzing the visual representation of boys and girls in popular children's books, how clothing choices and behaviors align with traditional gender norms was examined. Specifically, the following questions were addressed: (1) How are children's clothing choices linked to their activities and behaviors in images? Are girls often shown participating in more passive or nurturing activities, while boys are depicted in more active or adventurous roles? (2) Do the clothing choices of young boys in children's books reflect traditional masculinity? (3) Do the clothing choices of young girls in children's books reflect traditional gender stereotypes? A content analysis of 50 images from books spanning multiple decades revealed that earlier publications reinforced rigid gender roles. Girls were typically portrayed in passive, nurturing roles, while boys were depicted as active and adventurous. Girls often appeared in pink, neat clothing, while boys wore blue and engaged in rough play. Literature has increasingly begun to feature characters with diverse clothing choices and illustrations that blur traditional gender lines, challenging traditional gender stereotypes. This shift reflects broader societal changes, including evolving views on gender roles. The findings suggest that while traditional gender roles still appear, there is more diversity in children's books today, which can help shape children's social development and how educators approach gender in the classroom.

GUADALUPE MOUNTAINS EROSION: TRACING THE ORIGIN AND EVOLUTION OF STREAM CHANNEL SEDIMENTS

Presenter(s): Jacob, Aaron, Undergraduate, Geography, Geology, and the Environment

Mentor: Dr. Lisa Tranel

Authorship: Aaron Jacob, Lisa Tranel, and Ella Xu

Spatial patterns of erosion are influenced by factors including rock type, rock strength, climate, tectonics, and surface processes. Tracing erosion patterns and identifying erosion controls help to answer a few questions on landscape evolution. The purpose of this research is to trace apatite mineral origins along stream channels and determine tectonic controls on rock type and hardness. This work also evaluates how stream sediments change over time from weathering, in both active channels and related terraces. We propose three hypotheses. First, we predicted that most apatite grains are from easily eroded bedrock. Second, we expect coarse-grained sandstones to yield larger apatite grains. Third, we hypothesize that gravels in active channels will be smoother from abrasion compared to semi-stationary coarser grains found in terraces influenced by chemical weathering. First, we determined quantity and quality of apatite minerals in different rock units for dating with (U-Th)/He methods, in which cooling age is affected by inclusions, zonation, and mineral sizes. The research also assessed gravel size and roughness of active and past deposits based on dimensional measurements and contour gage variability. Most recovered apatite minerals (95%) were anhedral, coarse or rounded. The mean diameter of apatite grains across six samples so far was 96.64 microns, above the optimal threshold of 70. We conducted a preliminary assessment of gravel smoothness using the Krumbein roundness scale. Sandstones in an active channel were more rounded (mean roundness of 0.6) than limestones (mean roundness of 0.4). Limestone gravels in the active stream channel were more rounded than limestone gravels in terraces (mean roundness of 0.2 and 0.3). Ongoing research will provide better understanding of spatial patterns of erosion throughout the uplift history of the Guadalupe Mountains. Understanding past erosion in historic conditions is the key to understanding potential future change.

ASSESSING GLACIAL MASS CHANGE AND ITS IMPACT ON WATER RESOURCES IN PARTS OF THE HIMALAYAS USING SATELLITE REMOTE SENSING

Presenter(s): Panta, Kriti, Graduate, Geography, Geology, and the Environment

Mentor: Dr. Wondwosen Seyoum

Climate change is accelerating glacier depletion in the Himalayas, significantly affecting water availability and balance in Nepal. Rising temperatures and shifting precipitation patterns contribute to rapid glacier retreat, altering the seasonal flow of glacier-fed rivers and increasing the risk of glacial lake outburst floods (GLOFs). This study investigates the long-term changes in Nepal's glaciers, focusing on their impact on hydrological systems. Using remote sensing data, including GRACE satellite observations, and climate records, the research analyzes trends in glacier mass loss and surface water variations. The study highlights the critical role of glaciers in sustaining water resources for drinking, agriculture, and hydropower, especially during dry seasons. Findings will provide insights into the long-term implications of glacier retreat on water security, informing climate adaptation strategies and regional water management policies.

MAPPING LATE ANTIQUE VILLAS

Presenter(s): Cordray, Brooke, Undergraduate, History

Mentor: Dr. Kathryn Jasper

Historical and archaeological research on Late Antique Villas is minimal but can be telling of European life during and after the Roman Empire. Often, these villas have multiple lives, transitioning into sites of production, religion, or centers for villages. Recent excavations at the Valle Gianni archaeological site suggest a rural villa but have not revealed any signs of a post-life transition. Instead, deposits of expensive marble and tesserae indicate abandonment and possible squatter activity. If similar sites throughout Italy present evidence of abandonment and squatting, they may suggest a much more rapid fall of the Roman Empire than currently believed. By mapping late antique villas with no sign of transformation, we can look for patterns which may give insight to when, where, and why some luxury buildings throughout modern-day Italy were abandoned while others flourished.

USING DATA TO ANALYZE MARBLE TRENDS IN THE ROMANO-BRITISH FRONTIER

Presenter(s): Fried, Amalie Undergraduate, History

Mentor: Dr. Kathryn Jasper

Emperor Diocletian formed a fixed-rate economy in the year 301 CE. Using the Edict of Maximum Prices, which tells general prices around the year 300 CE, I have mapped the Roman marble quarry sites. Mapping these dig sites and knowing the estimated price value associated with different marbles raises a question of cultural significance and the use of marble. To navigate this, we are studying the significance of different marbles in the British frontier of the Roman Empire by focusing on the use and reuse of marble in villas.

APPLYING MACHINE LEARNING MODELS TO PREDICT BRIDGE CONDITIONS

Presenter(s): Achammer, Ben, Undergraduate, Mathematics

Mentor: Dr. Mangolika Bhattacharya

Co-Mentor: Dr. Sally Xie

Authorship: Ben Achammer, Mangolika Bhattacharya, Sally Xie

Ensuring the safety of highway bridges requires continuous monitoring and updating. The current method used by the U.S. Department of Transportation simplifies bridge attributes into a few categories, averages them, and classifies bridges as "good," "fair," or "poor." This method fails to capture the complexity and interconnectivity of these attributes. By applying machine learning, we can better understand influential factors and patterns, leading to more accurate and efficient predictions.

In the first part of this project, we developed a Graphical User Interface (GUI) to visualize the extensive National Bridge Inventory (NBI) dataset, using dot plots to represent each bridge as a discrete entity. Tooltips provide identifying information for each bridge. The second part visualizes the results of various machine learning models used to predict bridge conditions, each with its own accuracy. Additionally, a separate heatmap of traffic, climate, and temporal attributes was constructed to visualize correlations between these bridge attributes.

The second part of the project experimented with applying machine learning models to the data, with the goal of creating a model that can reliably predict a bridge's condition based on only a subset of the attributes documented. Such models included logistical regression, decision tree, random forest, xgboost, and artificial neural networks using the scikit-learn library. Illinois bridges from the NBI dataset were explored first, and this process would later be repeated on New York bridges. From these Illinois bridges, a subset of traffic, climate, and temporal attributes were selected. The data subset was then cleaned, addressing any missing data. The majority of entries in this data subset were used in training these models, while the remaining were reserved for testing purposes. The bridge condition predictions of these models were then compared to the test data to judge each model's effectiveness.

IOT WEATHER REPORTING SYSTEM

Presenter(s): Bello, Ahmed, Graduate, Information Technology

Mentor: Dr. Elahe Javadi

Authorship: Ahmed Bello

This study synthesizes generative AI models and Internet of Things (IoT) tools to improve the accessibility of smart home applications for people with varying levels of visual abilities. Specifically, I use a DHT11 sensor to collect temperature and humidity data and transfer the data over serial communication to the computer, where that information is read to the user, removing the need for any additional screen-reading tools. I use a generative model named Edge Text-to-Speech that enhances my thermostat's versatility for users with different spoken languages across the world. This project has the option to record the data and make it accessible via a web interface, allowing real-time monitoring and data visualization. I investigate and report on the performance of the model using regular processors only. I also outline pathways through which my peers at Illinois State University can innovate with generative AI and IoT pipelines using open- sources models and platforms.

AI MUSICAL DEVELOPMENT

Presenter(s): Beltran Sanchez, Bridgette, Undergraduate, Information Technology

Mentor: Prof. Elahe Javadi

Authorship: Bridgette Beltran Sanchez

Creating music can involve various challenges. One of those challenges can be players' instrumental ability, or in other words, their varying skill levels on different instruments. While a user may be able to come up with melodies and music ideas, there may be a limitation in this creative process, where the user can only generate their music with their voice or a limited set of instruments. This project utilizes generative AI to remove the obstacles caused by a lack of instrumental experiences by optimizing general vocal input and finding suitable instrumentation to complement the track. The player can provide a general mood for the song, such as “energetic” or “melancholy,” to define their vision for the creative process, which AI will utilize as an initial point to suggest matching instrumentation. Additionally, audio emotion detection models such as HuggingFace’s Wav2Vec2 will be used to further identify tone, pitch, and emotional elements and suggest instruments that align with the specific mood. For example, if the input is recognized to be soft and melancholic, the model will supplement the track with matching instruments such as piano and orchestral arrangements. The player using the system can indicate desired sound effects or instruments, such as “include synth” or “include rain effects” to define preferences. Lastly, the user may select a different song as a reference to incorporate similar patterns into the generated song with models such as MusicGen on HuggingFace. This research project also assesses and reports on the generative AI capabilities that allow a vocal track to be further developed with instrumentation.

LEVERAGING THE POWER OF ARTIFICIAL INTELLIGENCE IN PHYSICAL APPLICATIONS

Presenter(s): Benard, Charlie, Undergraduate, Information Technology
Perhay, Alex, Undergraduate, Technology

Mentor: Dr. Elahe Javadi

Co-Mentor: Dr. Jeritt Williams

As the power of artificial intelligence (AI) tools increases, applications in which intelligence manifests itself in the physical world will thrive. The research of Physical AI (Li et al., 2021), sometimes called embodied AI (Liu et al., 2024), focuses on the models that enable such applications. Physical AI refers to the integration of artificial intelligence into physical systems, enabling these systems to perceive and intelligently interact with the physical world (Li et al., 2021; Xu et al., 2023). Physical AI leverages advanced AI algorithms and computational systems to enable physical agents to sense their environments, learn from interactions, adapt to dynamic contexts, and take action.

This research proposal aims to evaluate the behaviors of Koch v1.1 when using an open-source pre-trained Diffusion Policy. Diffusion Policy is an application of Diffusion Probabilistic Models (DPMs) (Ho et al. 2020) in the Reinforcement Learning (RL) context. Reinforcement learning (RL) is the type of learning achieved in an environment through feedback. Diffusion Policy in the Koch v1.1. robotics arm will generate feasible action sequences by modeling temporal dependencies between the actions. Training of such models has been accomplished using datasets of expert demonstrations or trajectories available in the AI literature. We use Hugging Face's open-source robotics framework, LeRobot. LeRobot provides state-of-the-art models, datasets, and tools for real-world robotics applications. The primary objective is to evaluate and enhance the Koch v1.1 arm's capabilities to execute tasks such as object manipulation and sorting, and we will share insights into potential pathways for our peers to engage in AI and Physical AI training, evaluation, and applications.

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DUNGEN CRAWLER

Presenter(s): Davis, Jordan, Undergraduate, Information Technology

Mentor: Dr. Elahe Javadi

Authorship: Jordan Davis

As generative AI becomes more well-established, the landscapes of both technology and creative mediums shift, and new paradigms are created every day. The intersection between these two bubbles, video gaming, benefits the most from these developments and has a plethora of untapped ideas left to explore. With this project, I aim to bridge the gap between old gaming and new technology by developing a game styled like old text-based RPGs powered by generative AI.

This project involves using GradioDungeon developed by Hugging Face user VamooseBambel, and fine- tuning it to work within a new, fully developed world that users can interact with in deep, thoughtful ways that could not be accomplished with the technology of decades past. Players will be able to shape their world line by line, with each interaction changing their reputation, interactions, and abilities. I will investigate and report the efficacy of this model in this context.

NLTEXT2SQL

Presenter(s): DeGeare, Nolan, Undergraduate, Information Technology

Mentor: Prof. Elahe Javadi

Authorship: Nolan DeGeare, Elahe Javadi

Interacting with databases often requires knowledge of SQL, which can be a barrier for users unfamiliar with query languages. This project addresses this challenge by translating Natural Language (NL) into Structured Query Language (SQL). This project aims to allow users with no SQL knowledge to query a database and find specific information with just normal English sentences.

This project creates and investigates the performance of a generative AI application that uses open-source pre-trained models (e.g., gaussalgo/T5-LM-Large-text2sql-spider) available on Hugging Face. The currently available models can process a user statement and generate the SQL query to it, along with logging the request and what is returned. The dataset used for testing contains NBA player statistics from 1980-2022 and is stored in an SQLite database. Users can input requests such as "Select the college that the most players went to" or “Select the player with the highest point average” and receive a properly formatted SQL query to retrieve the relevant data.

This project involves prototyping the application and examining the methods for improving efficiency. Furthermore, the research will explore and report on enhancing the usability of the application by enabling users' requests to be closer to plain English than using keywords and standards of the Structured Query Language.

SO-100 WITH LEROBOT

Presenter(s): Jain, Neer, Undergraduate, Information Technology

Mentor: Dr. Elahe Javadi

Co-Mentor: Dr. Jeritt Williams

This research explores the application of artificial intelligence in robotics, specifically through the use of the LeRobot framework. LeRobot offers cutting-edge AI models, datasets, and tools that facilitate the integration of imitation learning and reinforcement learning into real-world robotic systems. In this project, we focus on using these AI techniques to develop a robotic arm, leveraging pretrained models and human-collected demonstration datasets. The goal is to showcase how AI can enhance robotic performance, enabling more intuitive and adaptable behavior in real-world settings. By utilizing simulation environments and minimizing the need for physical robots, we demonstrate the power of AI in streamlining robotic development and lowering the barrier to entry for AI-driven robotics. This project emphasizes the potential of AI to revolutionize the field of robotics, enabling scalable and efficient solutions across various domains.

ARDUINO AS A DMX FIXTURE

Presenter(s): Johanson, Hunter, Undergraduate, Information Technology

Mentor: Dr. Elahe Javadi

Currently, the Digital Multiplex 512 (DMX512) protocol is primarily used for stage and architectural lighting systems because of its ability to transfer multiple lighting parameters over a long distance. This project aims to repurpose and integrate this widely adopted protocol to control non-lighting hardware such as motors. Using an Arduino microcontroller integrated with a DMX transceiver enables precise, low-latency control over motor speed, position, and coordination in real-time environments. The system's flexible design allows for easy adaptation to many different applications, ranging from automation to industrial control and interactive installations. Depending on the design, such a system will be capable of executing complex motion sequences and synchronizing multiple actuators simultaneously, making it an excellent candidate for designing dexterous robotics arms.

This project investigates and showcases platform supports for the seamless integration of multiple DMX- based systems for novel automation use cases. By reimagining the traditional role of the DMX protocol, this project lays the foundation for future hardware interfacing solutions that increase both functionality and efficiency in modern, already-installed control environments.

AI AGENTS FOR STUDENT TIME MANAGEMENT

Presenter(s): Lucer, Szymon, Undergraduate, Information Technology

Mentor: Dr. Elahe Javadi

Authorship: Szymon Lucer

Juggling various responsibilities can prove to be challenging for many students. This project investigates open-source generative AI models to optimize a student's time management by creating unique schedules tailored to their needs. Students provide their background information about their weekly responsibilities, including classes, homework, extracurricular activities, job duties, and habits. Using this information, the program creates a personalized schedule that covers the days of the week on which to focus on specific tasks. Using AI agents and Google Calendar's API, students have the schedule updated to their Google account's Calendar service, allowing for interaction on multiple devices. The project compares and reports the performance of the tool using two open-source models. The research provides insights into the application of current AI models for enhancing students' time-management capabilities.

AI IN HEALTHCARE ROBOTICS

Presenter(s): Malagoni, Meghana, Graduate, Information Technology
Uppunuthula, Sankeerthan, Graduate, Information Technology
Rayan, South, Graduate, Information Technology
Sribuaai, Suphasit, Graduate, Information Technology

Mentor: Dr. Will Lewis

In microsurgery, artificial intelligence (AI) robotics can safely perform small tasks or assist doctors in more complex tasks, providing an invaluable tool for medical professionals. However, while small advancements, such as improved precision and flexibility, have been achieved, the larger goal is to develop AI-controlled machines that can perform full surgeries independent of human interaction.

Fully independent robotic surgery would open a gamut of possibilities for consistent healthcare worldwide. The state of these robots is still experimental, but tests are being conducted for complex tasks such as suturing, hair implantations, total knee replacement, and cochlear implants. Once achieved, fully autonomous robotic surgery could have substantial impacts on the medical field. The robot could be used for surgeries in rural areas where hospitals are few and far between. They could also be used in war zones to help in areas where it would be dangerous for humans to reach.

One challenge to this goal, in the form of real-time analysis of complications during surgery. Human bodies are incredibly complex and complications can arise in surgery at a moment's notice. The issue is that AI is systematic and follows procedures step by step. The purpose of this descriptive study is to identify and explore the areas where AI will have to be developed and improved in order to achieve fully autonomous robotic surgery.

AUDIO FILE TO GUITAR TAB AI

Presenter(s): Mccaslen, Aiden, Undergraduate, Information Technology

Mentor: Dr. Elahe Javadi

This project's goal is to use generative AI models to transform audio or video files into a playable guitar tab, which is basically a simplified guitar music sheet. The project prototype will accomplish this by using an open-source model available on Hugging Face to extract the audio file into a spectrogram, which can then be analyzed. Throughout this project, I will investigate separating the audio files first so that the AI model analyzes only the guitar part of a song as opposed to getting the frequencies from the whole song to avoid confusing the AI. Specifically, the AI can look at the frequencies shown in the spectrogram and use the data collected to translate them into notes that should be played for that respective frequency. Once the AI model has the notes, the pipeline becomes a simple translation into the guitar tab itself. I have identified candidate models and datasets of about 1.11k songs with descriptions to feed to the model so that it learns a variety of songs, which will lead to the ability to request a certain genre of song to find/ create and then generate the tab off of that as well. I will investigate and report on the performance of the model. This research project will showcase possible applications of and challenges related to the use of generative AI for audio classification.

TIME UTILIZATION OPTIMIZER

Presenter(s): McCue, Brady, Undergraduate, Information Technology

Mentor: Dr. Elahe Javadi

The Schedule Optimization/Time Utilization Optimizer project seeks to lighten the tedious task of scheduling for busy individuals, primarily students. I want to provide students with the help they require to optimize their current schedule or give guidance to determine their plan of action for their future semesters. However, it will be able to create restrictions depending on any given set of events, so it can be useful to any individual who is required to keep an organized and timely schedule. By utilizing user- provided inputs such as class schedules, professor office hours, and required events, this tool will optimize daily schedules to maximize time efficiency. Using open-source large language models such as Mistral-7B- v0.1 model, fine-tuned with LoRa for efficiency, the tool will create .csv files containing relevant data, which will be processed using Pandas to generate required time slots. The system will allow adjustments and non-repeating events, ensuring it is adaptable to new events and changing schedules. This project aims to provide an assistant tool that enhances time management by organizing and optimizing the user's routine. Although I only began with students in mind, it’s easy to use this tool for any rigorous schedule. It will also be able to provide schedules for multiple individuals or could be potentially used to schedule a company's workload effectively so all workers have optimized recurring events that don't interfere with their coworkers/management.

UNMASKING PHISHING: A DATA-DRIVEN ANALYSIS OF TRENDS AND TACTICS IN CYBER DECEPTION

Presenter(s): Nguyen, Han, Undergraduate, Information Technology

Mentor: Dr. Yousra Javed

Authorship: Han Nguyen, Yousra Javed

Phishing attacks continue to pose a significant threat to individuals and organizations, leveraging deception to steal sensitive information. This research aims to analyze phishing websites by examining patterns and trends within a dataset of known phishing URLs. Using publicly available datasets from sources like PhishTank and OpenPhish, the study identifies common characteristics of phishing websites, such as domain name trends, SSL certificate usage, and the countries where these sites are hosted. Additionally, content analysis reveals the methods used by attackers to mimic legitimate websites, including URL spoofing and the use of fake login forms. By analyzing these patterns, the research provides insights into the evolving tactics of phishing attacks and offers recommendations for improving phishing detection and prevention strategies. This research contributes to a deeper understanding of phishing threats, which can be used to inform better security practices and more effective anti-phishing measures.

BREAKING THE SILENCE: AI'S UNTAPPED POTENTIAL IN BANKING

Presenter(s): Patel, Darshita, Graduate, Information Technology
Kolukula, Carmel Pavithra, Graduate, Information Technology
Vallepalli, Sai Lakshmi, Graduate, Information Technology

Mentor: Dr. Will Lewis

Imagine a world where banks anticipate your needs before you even ask, where employees make smarter decisions with the help of cutting-edge technology, and where your financial security is protected by an invisible, yet incredibly powerful force. This is not science fiction—it's the hidden power of Artificial Intelligence (AI) in banking.

While AI has already made waves in industries like education and healthcare, its application in banking remains relatively untold. We often hear about how AI is revolutionizing classrooms and improving patient care, but how is it transforming the way banks operate, serve customers, and empower employees? This research delves into the hidden role of AI in the banking sector, exploring how it enhances customer experiences through chatbots, fraud prevention, and personalized financial services. However, how much of this is merely automated, and how much is actually accurate?

As AI examines customer spending patterns and forecasts their needs, the question arises:
How can AI carve out a more prominent place in the banking sector, gaining the same recognition and visibility as it has in healthcare and education? This research explores the strategies that banks can use to enhance AI's adoption, increase its transparency, and build trust with both the industry and the public.

On the flip side, we will investigate how AI is reshaping the banking workforce by automating processes, improving decision-making, and boosting productivity.

Through this exploration, we aim to shed light on how AI is already making an impact in banking today and uncover the limitless potential it holds for the future, benefiting both customers and employees. The future of finance is here—but are we ready for it.

OPTIMIZING LOW LATENCY AI FOR ROBOTICS: DEPLOYING VISION AND SOUND MODELS ON AN ESP32-S3-EYE

Presenter(s): Witkowski, Daniel, Undergraduate, Information Technology

Mentor: Dr. Elahe Javadi

This project explores the deployment of low-latency computer vision and voice recognition models on the ESP32-S3-EYE module to control an AI-powered robot car. Using Google's Teachable Machine, the system trains and tests models for recognizing visual and auditory inputs. The ESP32-S3-EYE, a microcontroller with an onboard camera and microphone, supports machine learning inference while operating under strict memory and processing constraints. To optimize performance, this project utilizes Lite Runtime (LiteRT), a framework which allows machine learning to be deployed on edge devices with small memory and processing power. The research examines inference speed, memory efficiency, floating-point precision, and serial communication between the ESP32-S3-EYE and the robot's control system. The project prototype involves training, testing, and evaluation of vision and sound models using TensorFlow. It is hypothesized that LiteRT will reduce inference latency and improve responsiveness, demonstrating the feasibility of deploying AI on resource-constrained devices for robotics and smart home applications.

BODY COMPOSITION PROFILE OF NCAA DIVISION I WOMEN'S VOLLEYBALL PLAYERS

Presenter(s): Jordan, Cassandra, Graduate, Kinesiology and Recreation

Mentor: Dr. David Thomas

Co-Mentor: Dr. Kristen Lagally

Authorship: Cassandra Jordan, David Thomas, Kristen Lagally, Diego Soto

Body composition plays a major role in overall health. In athletics, it can also be a determinant of performance. Guidelines exist for body fat percentage (%BF) and bone mineral density (BMD) for the general population. Sport-specific body composition in female athletes is understudied, and guidelines for female athletes are lacking. Those that do exist group multiple sports together. PURPOSE: To profile the body composition, specifically %BF, lean mass (LM), fat mass (FM), bone mineral content (BMC), and BMD, of a NCAA Division I women's volleyball team and compare results to existing research and guidelines. METHODS: Nine female volunteers (age 19.78 $\pm$ 0.97 years) had height (Ht) and mass measured, and underwent a dual x-ray absorptiometry (DEXA) scan to measure body composition. Body mass index (BMI) was calculated by mass (kg) divided by height (m) squared and classified using CDC categories. Means and standard deviations were calculated for body composition variables, and Pearson correlation coefficients were calculated between certain variables. RESULTS: Means and standard deviations were: Ht 177.72 $\pm$ 6.95 cm; Mass 73.71 $\pm$ 7.27 kg; BMI 23.38 $\pm$ 2.31 kg/m^2; %BF 31.99 $\pm$ 4.02%; FM 23.21 $\pm$ 3.68 kg; LM 46.50 $\pm$ 5.36 kg; BMC 2,677.67 $\pm$ 223.35 g; BMD 1.20 $\pm$ 0.08 g/cm^2. The correlation between BMI and % BF was r = 0.78, R^2 = 0.61. The correlation between %BF and BMD was r = 0.40, R^2 = 0.16. The correlation between LM and BMD was r = -0.34, R^2 = 0.12. CONCLUSIONS: According to ASCM's Fitness Categories for Body Composition (%BF) for Women by Age, the average %BF of the participants is categorized as 'very poor'. The correlation between %BF and BMI was positive and strong, indicating that BMI may be a good predictor of %BF in NCAA Division I women's volleyball players. The correlation between %BF and BMD was positive and moderate to low, meaning that greater %BF may indicate stronger bones. These results were expected. The correlation between LM and BMD was negative and moderate to low, meaning that more LM may indicate weaker bones in this population. Compared to existing research, this result was unexpected. Further research is needed to understand why this result occurred; however, a low subject number could account for it. Assessing body composition in female athletes is beneficial for understanding health, may account for certain factors of performance, and can be useful in understanding the effectiveness of their training regimens.

TRACKING BODY COMPOSITION PROFILES IN NCAA DIVISION I COLLEGIATE BASEBALL PLAYERS

Presenter(s): Pettys, Blake, Graduate, Kinesiology and Recreation

Mentor: Dr. Samantha McDonald

Authorship: Blake Pettys, Evan R. Semonis, Brett Scott, Jadon Konkel, Chris Carter, Kelly R. Laurson, Marcel L. Dos Santos, Michael Torry, Dale Brown

Shifts in athletes' body composition (BC) may significantly impact sport performance. Thus, accurately tracking these profiles may improve performance and prevent major injuries. However, changes in athlete BC profiles using state-of-the-art technology are unquantified. PURPOSE: To evaluate BC profiles in a sample of male, collegiate baseball players during the 2023-2024 season. METHODS: Data from 34 athletes with three, BC assessments were analyzed. The participants were 18.6 ± 1.4 years old, 79.4% non-Hispanic white, and 52.9% pitchers. Bone mineral content (BMC, g), non-bone lean mass (NB-LM, g), fat mass (FM, g) and % body fat (%BF) were quantified via dual-energy x-ray absorptiometry (DEXA) in the off-season (December), pre-season (February) and late season (April). Participants followed all pre-testing guidelines and were tested in the morning. Changes in BMC, NB-LM, FM and %BF were evaluated via repeated- measures ANOVA, adjusted for familywise error. RESULTS: BMC significantly increased (+0.04 ± 0.01 kg, 95%CI: 0.05, 0.2) between the off-season through pre-season. No significant differences in BMC were observed between pre-season and late season (+0.007 ± 0.01 kg, 95%CI: -0.03, 0.04). For NB-LM, a non- significant decrease was observed between the off-season and pre-season (-0.1 ± 0.2 kg, 95%CI: -0.5, 7.9). However, between pre-season and late season, significant decrements in NB-LM (-4.4 ± 0.2 kg, 95%CI: -4.9, -3.7) were found. Increases in FM did not significantly change between the off- and pre-season (+0.26 ± 0.2 kg, 95%CI: -0.29, 0.83), however, significantly increased during pre- and late season (+3.1 ±0.3 kg, 95%CI: 2.5, 3.8). %BF also exhibited a non-significant increase between the off- and pre-season (+0.3 ± 0.2%, 95% CI: -0.25, 0.75), however, significantly increased during pre- and late season (+3.8 ±0.3%, 95%CI: 3.2, 4.4). CONCLUSION: Through the off- and pre-seasons, only BMC showed a statistically significant increase. But, from pre-season through late season, significant decreases in NB-LM and increases FM and %BF were observed. These changes were consistent across all positions.

THE EFFECTS OF ANKLE BRACING ON LOWER LIMB BIOMECHANICS DURING A MAXIMAL VERTICAL JUMP

Presenter(s): Rekart, Dylan, Undergraduate, Kinesiology and Recreation

Mentor: Dr. Michael Torry

Authorship: Dylan Rekart, Jadon Konkel, Michael Torry

Introduction:

Ankle braces are used to prevent injuries and provide joint stability, but their effects on jump performance and biomechanics remain debated. Ankle injuries are common musculoskeletal injuries in sports. Athletes frequently wear ankle braces as a preventive measure to reduce the risk of sprains and enhance joint stability. Understanding how ankle bracing affects jump performance is essential for athletes, coaches and professionals to make informed decisions about brace use and performance deficits.

Purpose:

This study examines how ankle bracing influences the lower limb biomechanics of a maximal vertical jump.

Methods:

A healthy 21-year-old female (160cm, 57 kg) completed three trials of a maximal vertical jump in braced and unbraced conditions. The vertical jump is performed by standing in the starting position with feet shoulder width apart, then squatting down into the eccentric phase lowering to a 90 degree angle, then accelerating up into the concentric phase and landing back down. For the braced conditions, both ankles were tested and reported, but only the right ankle (dominant limb) was braced (McDavid Inc, lace-up). Kinematic (250 Hz, 10-cameras, Vicon, Inc) data were collected by adhering 41 retroreflective markers on boney landmarks of the subject. These markers defined a 23-segment rigid linked body. Force plate (1000 Hz, AMTI, Inc) data were simultaneously collected. Dependent variables included peak vertical jump height, peak ground reaction forces, peak hip, knee, ankle joint torques, and hip. knee, ankle ranges of motion.

Results:

A 14% reduction in maximal jump height was noted with the ankle braced condition, suggesting a performance deficit. Peak vertical GRF increased by 3.42%. Joint torque analysis revealed a 12.4% decrease in peak ankle torque, accompanied by a 27.42% increase in peak hip torque, highlighting compensatory adjustments in the kinetic chain away from the ankle to the hip. These findings suggest that while ankle bracing enhances stability and reduces mechanical load on the ankle, it shifts the biomechanical demands to the hip and knee. Athletes in sports requiring explosive lower-body movements may experience decreased jump performance when using ankle braces.

COMPARING ESTIMATES OF ADIPOSE AND SKELETAL MUSCLE MASS BETWEEN BOD POD AND DEXA IN COLLEGIATE ATHLETES

Presenter(s): Semonis, Evan, Graduate, Kinesiology and Recreation

Mentor: Dr. Samantha McDonald

Authorship: Evan R. Semonis, Diego A. Soto, Jadon Konkel, Samantha M. McDonald, Kelly R. Laurson, Marcel L. Dos Santos, Michael Torry, Chris Carter, Dale Brown

Accurately estimating skeletal muscle (SKM) and fat masses (FM) in athletes is crucial for effectively designing sport training programs. Recently, air displacement plethysmography (ADP) gained popularity in sport programs for measuring body composition (BC). A significant limitation of ADP is the reliance on a two-compartment model, measuring only FM and fat-free mass (FFM), potentially leading to misestimations in BC most concerningly, SKM. Dual-energy x-ray absorptiometry (DEXA) remains the gold- standard for quantifying BC, however, is underutilized in athletes. PURPOSE: To compare estimations in FFM and FM between ADP and DEXA methods in a sample of male and female collegiate athletes. METHODS: In total, 67 (males = 49, females = 18) athletes aged 17 to 22 years playing baseball, basketball, American football or soccer participated in the study. All athletes, in their respective off-seasons, underwent two sequential BC tests, BodPod (ADP) and DEXA. Athletes followed all pre-testing guidelines and were tested in the morning. The BodPod quantified FFM and FM using sex-, age- and sport-specific predictive equations while the DEXA directly estimated FFM (∑bone mineral content and SKM) and FM. Differences in the estimates of FFM and FM masses between DEXA and BodPod were compared via studentized paired samples t-test. RESULTS: Statistically significant differences in FFM and FM between DEXA and BodPod assessments were observed. Specifically, the BodPod significantly overestimated FFM (-6.2 ± 2.2 kg, 95%CI: -6.8, -5.7, $p<0.001$) and underestimated FM (+5.1 ± 2.1 kg, 95%CI: 4.5, 5.6, $p<0.01$) compared to the DEXA (FFM: 7.3 kg vs 6.7 kg and FM: 14.5 kg vs 19.6 kg, respectively). Similarly, the BodPod significantly underestimated %FM (+6.3 ± 2.7%, 95%CI: 5.6, 6.9, $p<0.001$) relative to the DEXA (16.6% vs 22.9%). The observed misestimations were consistent for male and female athletes. CONCLUSION: ADP significantly overestimated FFM and underestimated FM and %FM in our sample of collegiate athletes.SIGNIFICANCE/NOVELTY: Misestimating BC poses significant challenges in enhancing sport performance. Coaches heavily rely on body composition data for evaluating effectiveness of training programs and player performance, emphasizing the importance of utilizing gold-standard methodologies, like DEXA.

EFFECTS OF ANKLE BRACING ON LOWER EXTREMITY BIOMECHANICS DURING A SINGLE- LEG VERTICAL DROP LANDING

Presenter(s): Solomon, McKenna, Undergraduate, Kinesiology and Recreation

Mentor: Dr. Michael Torry

Co-Mentor: Jadon Konkel, Graduate Student

Authorship: McKenna Solomon

Introduction: Ankle injuries are common injuries in sports, leading to the use of ankle braces for support and injury prevention. However, ankle bracing may alter lower extremity biomechanics by modifying ground reaction forces, joint angles, and joint torques, potentially increasing stress on other joints. Landing mechanics play a significant role in the distribution of forces across the joints ultimately impacting injury risk. Purpose: The purpose of this study was to investigate the effects of ankle bracing on ground reaction forces, kinematics, and joint torques at the ankle, knee, and hip during a single-leg vertical drop landing performed during both soft and stiff landing techniques. Methods: A 22-year-old female (54.43kg, 164cm) with no history of lower extremity injuries volunteered as subject. The subject performed soft and stiff landings from a 30cm height in both braced (McDavid, lace-up brace) and unbraced conditions. A soft landing was explained as bending the knee to absorb the impact. A stiff landing was explained as trying to keep her leg as straight as possible with minimal joint flexion. Twenty trials were completed with the subject completing five trials for both landing techniques and braced versus unbraced conditions. Kinematic (250 Hz, 10-cameras, Vicon, Inc) data was collected by adhering 41 retroreflective markers on the boney landmarks of the subject. These markers defined a 23-segment rigid linked body. Force plate (1000 Hz, AMTI, Inc) data was simultaneously collected. Dependent variables included peak vertical ground reaction forces, ankle and knee ranges of motion, and peak joint torques at the ankle, knee, and hip. Results: Peak vertical ground reaction forces were higher in the braced condition compared to the unbraced condition for both landing techniques, with increases of 11.77% and 13.3% for soft and stiff landings, respectively. Ankle range of motion decreased by 27.7% in the soft landing and 44.2% in the stiff landing in the braced condition. Peak knee torque was slightly reduced in the braced stiff landing, while peak hip torque increased in the braced condition. Conclusion: Ankle bracing increased vertical ground reaction forces, decreased ankle range of motion, and altered peak joint torques which ultimately shifted mechanical stress to the knee and hip. While ankle bracing provides support to the ankle, it may increase the risk of injury at other joints. These findings suggest that there are implications of ankle bracing on landing mechanics and should be considered when suggesting use of an ankle brace to athletes.

CHANGES IN APPENDICULAR SKELETAL MUSCLE MASS IN DIVISION I COLLEGIATE BASEBALL PITCHERS

Presenter(s): Soto, Diego, Graduate, Kinesiology and Recreation

Mentors: Dr. Samantha McDonald and Dr. Kelly Laurson

Authorship: Diego Soto, Evan Semonis, Cassandra Jordan, Nathan Durr, Brett Scott, Blake Pettys, Jadon Konkel, Samantha McDonald, Kelly Laurson

Skeletal muscle mass (SKM) plays a critical role in sports performance and injury risk. For baseball players, maintaining SKM throughout the in-season is challenging given the large number of games played (50 to 56), shortened recovery time and travel. Of concern, pitchers rely heavily on the repeated use of their dominant arm followed by between-game resting periods. Quantifying changes in SKM from pre- through in-season is understudied, especially using gold standard methodology. PURPOSE: To quantify the changes in SKM from pre- through in-season in Division I collegiate baseball pitchers and evaluate differences between dominant and non-dominant upper and lower body limbs METHODS: Seventeen, male baseball players aged 20.9 Â± 1.3 yrs with an average height and weight of 186.3 Â± 3.8 cm and 92.7 Â± 6.5 kg, respectively, participated in the study. Appendicular SKM mass, the summed SKM masses of the upper and lower limbs, was quantified via DEXA scans at two, time points, pre- (February 2024) and late, in-season (April 2024). Participants followed the established pre-testing guidelines and were eligible for DEXA scans (e.g., fasted, hydrated). All scans were completed in the morning. Changes in SKM mass were quantified for the dominant and non-dominant limbs and compared via studentized paired t-tests. RESULTS: In pitchers, appendicular SKM significantly declined (1.9 Â± 0.7 kg; 95% CI: 1.5, 2.3 kg; p<0.001) from pre through late, in-season. Similarly, significant reductions in the dominant (0.5 Â± 0.5 kg; 95% CI: 0.3, 0.8 kg; p<0.001) and non-dominant upper limbs (0.3 Â± 0.4 kg; 95% CI: 0.08, 0.4 kg; p=0.004) and dominant (0.5 Â± 0.4 kg; 95% CI: 0.3, 0.7 kg; p<0.001) and non-dominant (0.6 Â± 0.4 kg; 95% CI: 0.3, 0.8 kg; p<0.001) lower limbs. The SKM mass of the dominant arm decreased 11.2% compared to 5.8% in the non-dominant arm, this difference, however, did not reach statistical significance. CONCLUSIONS: Significant decrements in total appendicular SKM mass in collegiate baseball pitchers were observed. Pitchers also exhibited a nearly 2-fold non-statistically significant decrease in SKM mass in their dominant relative to their non-dominant arm. Tracking changes in SKM mass throughout pre- and in-seasons of collegiate baseball may provide coaches information critical to their pitchers' performance and risk of injury.

IMPACT OF STRESS MANANGEMENT, PHYSCIAL ACTIVITY, AND VACCINE STATUS ON HEART RATE VARIABILITY

Presenter(s): Wisdom, Lauren, Undergraduate, Biological Sciences
Solomon, Mckenna, Undergraduate, Kinesiology & Recreation
Vondriska, Matthew, Graduate, Kinesiology & Recreation

Mentor: Dr. Karen Dennis

Authorship: Lauren Wisdom, McKenna Solomon, Matthew Vondriska, Karen Dennis

Introduction: There is conflicting research in whether the COVID-19 vaccine impacts the autonomic nervous system, more specifically heart rate variability (HRV) (Hajduczok et al, 2021). HRV is the time interval between heart beats used to measure autonomic nervous system (ANS) function and is an indicator of overall health and wellness (Kerkutluoglu et al, 2023). Stress can alter the sympathetic nervous system and a reduced HRV can be linked to health issues due to the body being unable to recover from stress. A higher HRV may indicate better stress resilience due to an increase in activity of the parasympathetic nervous system that helps manage stress. **Purpose:** The purpose of this study was to investigate the effects of physical activity and stress levels on heart rate variability (HRV) in vaccinated and non-vaccinated individuals. **Methods:** The participants in this study were students enrolled in a 16-week health/wellness course. The 67 individuals reported their vaccination status. Variables such as R-R interval, HRV, coherence, stress index, and VO2max were all assessed both at pre- and post-test. HRV and related variables, including R-R interval, coherence, and stress index, were assessed using the HeartMath emWave Pro software with a pulse plethysmograph ear sensor. Physical fitness measures, including VO_2 max, were recorded, and stress levels were evaluated using the State-Trait Anxiety Inventory for Adults. Mixed-Design Multivariate ANOVA was used to examine associations. **Results:** The non-vaccinated group showed a significant increase in HRV scores over time (Pre: 109.3 ± 44.4 ms, Post: 138.7 ± 51.0 ms, $p = .005$, $F(1,49)= 8.79$, $\eta^2 = .154$), suggesting improved autonomic function. In contrast, the vaccinated group exhibited a slight decrease in HRV scores (Pre: 113.1 ± 43.5 ms, Post: 104.2 ± 38.0 ms). R-R interval indicated no significant differences between group and time ($p = .109$, $F(1,49)=2.673$, $\eta^2 = .053$), but overall results in time (pre-test to post-test) suggested improvements. Coherence and stress index scores did not yield statistically significant results.

Conclusion: Our results show that non-vaccination status could be linked to improved autonomic Function when paired with education on stress management and physical activity, when compared with vaccination status. Although, the changes we observed could have been caused by other, unobserved factors. Further research is required to examine this relationship more conclusively.

KINESIO TAPE ON THE GASTROCNEMIUS AND ITS EFFECT ON VERTICAL JUMP PERFORMANCE

Presenter(s): Young, Colin, Undergraduate, Kinesiology and Recreation

Mentor: Dr. Michael Torry

Introduction. Kinesio tape (KT tape) is used as a therapeutic and injury prevention tool for individuals and elite athletes. Due to its elastic properties, KT tape could assist in athletic movements like jumping. Previous research found KT tape provides no significant difference in jump height with double leg take-offs; yet a 2.4 cm increase in jump height with single leg take- offs has been reported. An increase in peak isometric torque at the knee has also been reported. Thus, there are limited studies reporting mixed results regarding KT tape and jump performance. There have been no studies conducted regarding the effect KT tape has on the speed of the jump.

Purpose. This study investigated the effects KT tape would have on vertical jump performance of an athlete, specifically on the maximal height and velocity of the jump. Methods. The subject was a 21-year-old female {1.524m, 0.454kg} former collegiate cheerleader who volunteered to participate. Kinesio tape was applied to the gastrocnemius from insertion to origin. A 10-camera Vicon Nexus System (250 Hz) was used with two force plates (AMTI, Inc) which collected ground reaction force data. A 54 retro-reflective marker set was applied to the subject in a standard plug- in gait model. Electromyography (EMG) was captured for the medial gastrocnemius which was compared to a MVC collected via three trials of a single leg calf raise. Four maximal effort jumps were recorded under single and double leg conditions. The depth was controlled by touching a chair behind them, before performing the maximal vertical jump. The variables measured were maximal height and speed of the jump, ground reaction force, peak ankle torque, and average % MVC of the gastrocnemius. An unpaired t-test (alpha ≤ 0.05) was employed to detect significant differences. Results. There was no effect on double leg performance with KT tape. However, single leg jump performance was increased. Total time to reach maximal height was decreased by 0.2128 seconds ($p = 0.003$); suggesting KT tape to have a positive effect on the speed of a single leg countermovement jump. The peak ankle torque was decreased by 283.122 N.mm/Kg ($p = 0.0464$). Conclusion. While the results do not suggest the application of KT tape on the gastrocnemius as an alternative to increasing jump performance, it could supply a placebo effect to increase performance.

THE PERCEPTION OF STUDENTS AND INSTRUCTORS ON THE USE OF TECHNOLOGY IN TEACHING AND LEARNING OF FOREIGN LANGUAGES: THE CASE OF UNIVERSITY OF GHANA

Presenter(s): Apaflo, Dorcas, Graduate, Languages, Literatures, and Cultures

Mentor: Dr. Rachel Shively

Authorship: Dorcas Apaflo, Rachel Shively

The widespread use of technology tools for language learning has resulted in changes to the traditional learning classroom in countries around the world, including African countries like Ghana. The general perception about the importance of technology is that it has made language learning more enjoyable in the school setting. To understand perception on the use of technology in teaching and learning of foreign languages among students, questionnaires were administered to 14 foreign language students and 5 instructors at the University of Ghana. The results were analyzed using Qualtrics. The findings suggest that both instructors and students had a positive perception on the use of technology in teaching and learning foreign languages. On one hand, teachers indicated that the use of technology in language classes increased participation and productivity, enhanced communication, and improved linguistic skills of students. On another hand, students indicated that the use of technology in language learning increased collaboration and interaction in the target language. They explained that technology could be used as a teaser before the main lesson to enhance general learning experience, ease the stress of both teachers and instructors and help strengthen language acquisition in Africa. However, instructors encountered challenges such as lack of knowledge on the use of technological tools, interruption in internet connection, inadequate teaching time, and high cost of some technological tools. Students also experienced poor connectivity challenges, lack of knowledge of the use of tech tools, distraction, inaccuracy and limited explanations of some technology tools.

MOTS NON POLIS: A FRENCH LINGUISTICS BOARD GAME

Presenter(s): Dalbey, Nikki, Undergraduate, Languages, Literatures, and Cultures

Mentor: Dr. Sandra Keller

Authorship: Nikki Dalbey

I created this project to allow students of the French language to engage with sociolinguistic concepts and explore how language and language use are a form of social currency. My board game, submitted for my end-of-semester project in French 340, "Introduction to Applied French Linguistics," reimagines the Hasbro game "Monopoly" from a language rights perspective. I designed the game to encourage players to critically examine, first, how all varieties of French and other languages spoken in the Francophone world are linguistically rich and creative; second, how various social forces work to stigmatize that creativity; and third how our own choices can further or resist this dynamic.

The game's title, "Mots Non Polis," contains three layers of meaning. Firstly, when spoken with a standard French accent, it sounds like the title of the Hasbro game "Monopoly." Secondly, one translation of the phrase "mots non polis" is "unpolished words" which represents the French speakers who, by way of regional accents or dialects, do not conform to standard French as determined by l'Académie Française, the governing body of the French language. Lastly, a second translation of the phrase is "impolite words," which represents the criticisms made by the prescriptivist French who seek to invalidate others' "Frenchness" through attacks on their manner of speaking. The game then utilizes the words of the "unpolished" and "impolite" French speakers themselves as the means through which players are rewarded and/or punished. The linguistic facts I researched and present in the form of "property" descriptions are meant to show players that these "unpolished" varieties of French are creative, systematic, and nuanced.

This game also engages with the concepts of language creation (creoles and neologisms), language diffusion, language loss, and loanwords. It uses words as currency while it embraces a descriptivist approach that encourages players to recognize the unjustness of using narrow views of language and language use to determine a person's value. By creating this game that implicates players emotionally and cognitively in the fate of linguistic diversity, I hope to spark new conversations about language and empathy, in the French- speaking world and here at home.

THE RELATIONSHIP BETWEEN EMPLOYEE PERSONALITY TRAITS AND PREFERRED LEADERSHIP STYLES

Presenter(s): Carlson, Colby, Undergraduate, Management

Mentor: Dr. Yongmei Bally

Authorship: Colby Carlson

Personality traits have been widely recognized as key factors influencing leadership effectiveness, but limited research has explored how personality traits influence preferred leadership styles from the follower's perspective. This study aims to fill the gap in research by examining the role of the Big Five personality traits (i.e., openness, conscientiousness, extraversion, agreeableness, and neuroticism), in employee leadership style preferences for autocratic, democratic, and delegative leadership. This study reveals that neuroticism had a significant positive association with democratic leadership, and openness to experience had a significant negative association with autocratic leadership. Age was found to influence leadership preferences, with older individuals showing a stronger preference for democratic leadership and a rejection of autocratic leadership, while younger individuals preferred autocratic leadership. The analysis finds no significant correlates of delegative leadership preferences. These findings suggest that both personality traits and age shape leadership style preferences, providing valuable insights for leadership development programs. Practical implications for organizational leadership and directions for future research are discussed.

MUSIC

RECENT DEVELOPMENTS WITH THE HAMMERED DULCIMER, 1975-PRESENT

Presenter(s): Prado, Ethan, Graduate, Music

Mentor: Dr. Allison Alcorn

Authorship: Ethan Prado

A commission for a hammered dulcimer piece from a friend led me down quite the rabbit hole of information in researching the instrument. Many of the articles I read kept pointing towards the same set of sources, and these publications had a general lack of information past 1975, despite being published after that year. Even though academic publications from then until the present are sparse, there is concrete evidence that the hammered dulcimer is a small but thriving community with new works being written for the instrument as well as very active organizations which bring together enthusiasts both new and old. First, a very brief overview of the hammered dulcimer's origins, spread, and downfalls are given. Next, I have examined three works written within the last 25 years by living musicians - new repertoire is in fact being written for the instrument beyond its folk associations. Then, we go back in time and contextualize the importance of major organizations founded around the cutoff year, which includes The Original Dulcimer Players Club and Dulcimer Players News, before looping back to the present. There have been several recent external developments that have greatly affected the dulcimer community and tie in with the origins of some composers. These developments include the COVID-19 pandemic, Hurricane Helene, and the attacks against the Internet Archive. Despite all odds, the hammered dulcimer has never fallen into complete obscurity due to the fortitude of its community.

THE IMPACT OF EXERCISE ON PERCEIVED DEPRESSION AMOUNG INDIVIDUALS DIAGNOSED WITH HEART FAILURE WITH PRESERVED EJECTION FRACTION

Presenter(s): Krebs, Harrison, Graduate, Nursing

Mentor: Dr. Marilyn Prasun

Authorship: Harrison Krebs, Marilyn Prasun, Annette Hubbell, John Blakeman, Matthew Hesson-McInnis

Introduction

Heart failure (HF) is the common final pathway for many cardiovascular diseases. Approximately half of those individuals have HF with a preserved ejection fraction (HFpEF). Many individuals with HFpEF also report experiencing depression. Depression, combined with HFpEF, can place individuals at risk for increased mortality and hospital admissions. Exercise is recommended for individuals with HFpEF. However, exercise to manage depressive symptoms among individuals with HFpEF has yet to be fully explored.

Objectives

This systematic literature review aimed to examine the effects of exercise therapy on depression reported by individuals diagnosed with HFpEF.

Method

A systematic literature search was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) methodology in five databases: SPORTDiscus, PubMed, Cumulative Index to Nursing and Allied Health Literature, Academic Search Complete, and the Joanna Briggs Institute Evidence-Based Practice Database. Inclusion criteria consisted of studies published in English that were original human subjects' peer-reviewed research, that enrolled adults diagnosed with HFpEF, used exercise as a form of treatment and measured depression as an outcome. Exclusion criteria consisted of nonhuman subjects research, gray literature and non-peer-reviewed published studies, or studies of individuals with HFpEF younger than 18 years of age.

Results

A total of sixty-six studies were identified, but only five (totaling 306 participants) met the inclusion criteria. Exercise therapy consisted of strength, endurance training, and Tai Chi. Exercise capacity significantly improved when measured via the 6-minute walk test but had varied results when measured via peak VO2. Depression was measured using various validated instruments which included, the Patient Health Questionnaire (PHQ-9), Geriatric Depression Scale-15, Profile of Mood States, and the Hare-Davis Cardiac Depression Scale. All five studies showed improved depression scores following exercise therapy, with four studies reporting statistically significant improvements. Specifically, depression was reduced by 0.8 points (measured with the Geriatric Depression Scale-15), 2 points (measured with the PHQ-9 tool), 1.7 points (measured with the subscale of Depression in Profile of Mood State), and 3.95 points

(measured with the PHQ-9) in these 4 studies. The fifth study demonstrated a 7-point improvement in depression (measured with the Hare-Davis Cardiac Depression Scale), though this change was not statistically significant.

Conclusion

The data from this systematic review suggests that exercise can be a practical approach to improving reported depressive symptoms among individuals with HFpEF. However, more robust research is warranted to confirm these findings and long-term benefits.

THE POWER OF TRANSFORMATIVE LOVE

Presenter(s): Mayback, Clo, Undergraduate, Philosophy

Mentor: Dr. Daniel Breyer

Authorship: Clo Mayback, Daniel Breyer

If you could drink a love potion that guarantees you would fall deeply in love but fundamentally changes your desires, values, and sense of self in unpredictable ways, would you take it—and what does this say about the nature of your freedom and agency? Is love truly free?

In the free will debate, some argue that our choices are determined, while others believe we have full control over them. Love challenges this divide—it feels beyond our control, yet deeply personal. This research introduces noncompatibilism, a theoretical framework that transcends the compatibilist-incompatibilist divide through a transformational account of free will. Instead of seeing love as either fully determined or completely free, noncompatibilism understands love as a transformational force that changes agency itself.

Building upon Harry Frankfurt's theory of volitional necessity, L.A. Paul's work on transformative experience, and theories of emergence, this research demonstrates how agency emerges through transformative experiences that fundamentally reshape human decision-making and self-understanding. Through Frankfurt's idea that love both binds and expands our will, I explore how love shapes our choices in ways that feel both necessary and freeing. L.A. Paul's concept of transformative experience, illustrated by her vampire thought experiment, shows how love, like radical transformation, reshapes our desires in ways we cannot predict. The theory of emergence further explains how love creates new possibilities for choice, rather than fitting into a fixed framework of free will or determinism.

Through noncompatibilism, I present a case for understanding the connection between love and freedom—not as a choice we make, nor as a force that controls us, but as something that transforms who we are and what we can will.

FREE WILL, GRACE, AND GOD'S OMNIPOTENCE

Presenter(s): Reckamp, Robert, Undergraduate, Philosophy

Mentor: Dr. Daniel Breyer

Many struggle to reconcile our free will with God's providence over everything. Understanding sufficient and efficacious grace lets us accept both a meaningful sense of free will and God's omnipotence and omniscience. In this presentation, I will lay out the Thomistic principles of grace and compare two different interpretations of them, the first by Fr. Reginald Garrigou- Lagrange and the second by Fr. Francisco Marin-Sola. Grace is defined by the Catechism of the Catholic Church as "favor, the free and undeserved help that God gives us to respond to his call to become children of God, adoptive sons, partakers of the divine nature and of eternal life" (CCC 1996). Garrigou-Lagrange and Marin-Sola disagree on what sufficient grace is and what we can do by the aid of sufficient grace. Lagrange thinks that sufficient grace gives us the real power to do a good act, but that we cannot actually do any good act without the aid of efficacious grace. On the other hand, Marin-Sola thinks that sufficient grace really gives us an act, but an imperfect one. Sufficient grace begins the good action in us, but we may resist it of our own free will and so prevent the good action. Sola also thinks we can do some easy good works with sufficient grace only, such as a quick prayer. To Marin-Sola, efficacious grace differs from sufficient grace in that it is irresistible and infallible, necessary for completing difficult good works, while sufficient grace is still efficacious for the beginning of the action, but not for the perfection of the work, which requires efficacious grace that will be provided by God if the sufficient grace is not resisted. I argue that Marin-Sola's view better protects a strong sense of free will while remaining consonant with the Thomistic principles. I first lay out the relevant principles that are accepted by all Thomists. I next outline Garrigou-Lagrange's view on sufficient grace, then Marin-Sola's. Finally, I argue why Marin-Sola's view better protects free will and the real sufficiency of sufficient grace.

COMPUTATIONAL MODEL FOR C. ELEGANS' THERMOTAXIS

Presenter(s): Gomez, Lylia, Undergraduate, Physics
Mentor: Dr. Epaminondas Rosa Jr.
Authorship: Lylia Gomez, Zach Mobile, Rosangela Follmann, Epaminondas Rosa Jr.

Caenorhabditis elegans is a free-living transparent worm, about 1 mm in length, inhabiting temperate regions across the Earth. This worm is a widely used research model for studying biological phenomena. Its connectome consists of 302 neurons, including 68 sensory neurons that detect chemicals, touch, and temperature. Most studies involving these worms are experimental, rather than computational, particularly concerning temperature effects. This research builds upon an existing model by including temperature features in the differential equations representing the worm's thermotaxis behavior. The equations allow for a methodology to predict the calcium response of a single C. elegans amphid finger-like neuron (AFD) at varied temperatures by employing a dynamical mechanism and without requiring intricate physiological parameters. This work indicates that calcium responses in AFD neurons may be conceptualized as a biochemical process in which activation and inactivation are modulated by Arrhenius factors. Additionally, we model two coupled AFD neurons to study directional locomotion and movement along a temperature gradient. These neurons, located on the left and right sides near the worm's nose, sense temperatures on each side. Based on sensed temperatures and the cultivation temperature, they produce motor outputs that direct movement left or right, refining the previous model which predicted movement toward hot or cold.

DIAGRAM GENERATION FOR SPINOR AMPLITUDE SUBROUTINES

Presenter(s): Minney, Gabriel, Undergraduate, Physics

Mentor: Prof. Neil Christensen

Authorship: Gabriel Minney, Neil Christensen

Fundamental particles are the building blocks of the physical world. Physicists have studied the interactions between fundamental particles using experiments such as those conducted at the Large Hadron Collider (LHC) and by using Feynman Diagrams alongside numerical techniques to predict the outcomes of these experiments. However, Feynman Diagrams introduce unphysical degrees of freedom into calculations, an aspect that greatly hinders the efficiency of numerical calculations of scattering amplitudes. Using constructive diagrams instead of Feynman diagrams offers the prospect of removing these unphysical degrees of freedom, which could greatly increase the scope of scattering amplitude numerical calculations. The algorithmic generation and preparation of expressions for numerical calculations using constructive diagrams poses many unique problems, such as the recursive generation of interaction topologies and the algebraic manipulation of expressions to remove singularities. Raptor is a program-in-development that aims to solve these problems.

ISOLATING DIFFUSION COEFFICIENTS OF LATTICE DEFECTS IN COULOMB CRYSTALS

Presenter(s): Webb, Levi, Graduate, Physics

Mentor: Dr. Matt Caplan

Authorship: Levi Webb, Dany Yaacoub, Matt Caplan

The diffusion coefficients of Coulomb crystals, as applicable to stellar astrophysics, have seldom been studied to a satisfactory level. Molecular dynamics (MD) studies such as this inform our understanding of the macroscopic properties of stellar remnants, such as white dwarfs and neutron stars. We use the MD code LAMMPS to simulate small Coulomb crystal lattices of varying temperature and screening length, then introduce defects by either inserting (interstitials) or removing (vacancies) particles. By tracking the propagation of these defects and their interactions with the surrounding lattice, we determine their diffusion coefficients. This research enhances current understandings of defect-driven diffusion in strongly coupled plasmas, thereby influencing knowledge of the thermal and mechanical evolution of the dense matter within white dwarfs and neutron star crusts.

SCHOOL DIFFICULTIES RELATED TO RECIDIVISM RATES WITH JUVENILE YOUTHS

Presenter(s): Aclibon, Shari Nicole, Graduate, Psychology

Mentor: Dr. Adena Meyers

The association between school difficulties and delinquency is fundamentally complex. Early aggressive behavior can lead to classroom challenges, negative evaluations, and potential delinquency (McCord, 2000). Verbal and reading deficits are also linked to victimization (both inside and outside school), drug use, aggression, and delinquent behavior when students fall behind in reading become marginalized as "failures" (McCord, 2000). School failure can hinder academic interest and commitment, and feelings of isolation and lack of emotional support may contribute to delinquent behaviors (McCord, 2000). The school-to-prison pipeline refers to the set of policies and practices that increase the likelihood of students facing criminal involvement rather than educational support (Mallet, 2016). This phenomenon implicates punitive approaches in schools, or the "criminalization of school discipline" (Hirschfield, 2018), which can lead to academic setbacks and juvenile justice involvement (Villalobos & Bohannan, 2017). Once youths are involved with the juvenile court, there is a higher probability of recidivism, or reoffending (NIJ, 2008). Suspensions and expulsions from school are recognized as potent indicators of the school-to-prison pipeline. (Novak, 2022). This current study explores the association between a range of school difficulties and recidivism among youths involved with the juvenile justice system. A series of logistic regressions were conducted to examine the association with a range of school difficulties and recidivism. Because youths who spent more time in the juvenile justice system had more opportunities to reoffend and to experience school problems, the number of days of juvenile court services was used as a control variable. The results of the study showed that failed courses significantly predicted recidivism [B= 1.984, Exp(B)= 7.269 and p= .026]. Additionally, expulsions marginally predicted recidivism (B= 2.167, Exp(B)= 8.736, and p= .095)., while other school difficulties did not yield significant results. The finding that academic failures are a stronger predictor of recidivism than exclusionary discipline suggests that academic achievement may play a critical role in the school-to-prison pipeline.

RIPPLE LAB ESPORTS PROJECT

Presenter(s): Berger, Matthew, Undergraduate, Psychology

Wright, Payton, Undergraduate, Psychology

Mentor: Dr. Burak Ozkum

With how influential personality is, we aspire to determine the effects of personality on team composition. Particularly, we will focus on team composition in the professional video game scene, eSports. eSports is a competitive environment where players work in teams or on their own to play video games at a high skill level. For our study, we will be focusing on team eSports gaming and conducting research to determine the effects of personality on these teams.

To determine and define 'personality,' we referred to foundational personality concepts like the Big Five (Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism) and The Dark Triad (Machiavellianism, Narcissism, and Psychopathy) to form a list of trait definitions to help conceptualize our work. With common personality traits defined, we used a general job analysis structure to create an interview. This interview sheet was used to discuss with Illinois State University eSports teams (players and coaches) to understand what eSports players find valuable in their teams.

We interviewed ISU eSports teams, including teams for the video games League of Legends, Overwatch 2, Counter-Strike 2, Rocket League, and Valorant. Our respondents were players ranging from leadership to supportive roles. We also interviewed the coach of the League of Legends team. Participants described personality traits they found valuable or unimportant to the structure of their teams. Certain traits might rank differently depending on the eSport game or the player's role in-game or on the team. Participants gave ideas of team structure for different eSport games. Having these conceptualizations of how a player of Overwatch 2 might play, for example, helps determine valuable personality traits in that setting, as opposed to different eSport games. Two raters on our research team analyzed the interview responses to understand emerging themes, like the value of team communication or working together to accomplish in- game goals.

We will survey eSports players based on interview responses to get a quantitative outlook on the effects of personality on eSports teams. This survey will refer to responses found in our interview results. Questions regarding the value of personality traits or actions in the respondent's eSports game, the importance of general or specific knowledge, skills, abilities, and other characteristics (KSAOs), the importance of different performance criteria, team processes, and essential functions will be found in the survey. Once completed, the survey will be given to eSports collegiate teams beyond ISU to understand personality's influence in eSports better.

EFFECTS OF FOOD ALLERGIES AND INTOLERANCES ON COLLEGE STUDENTS: USING THE CONCEALABLE STIGMATIZED IDENTITIES FRAMEWORK

Presenter(s): Carlos, Nicole, Undergraduate, Psychology

Mentor: Dr. Caitlin Mercier

Authorship: Nicole Carlos, Caitlin Mercier

Sparse research observes the effects of food allergies and intolerances (FA/FI) on college students. Using the Concealable stigmatized identity frame, I qualitatively explore how college students navigate stigmatization, social interactions, disclosure of the food allergies/intolerances. Additionally, I investigate the intersectioning identities shape the experiences of college students. Implications comprise of spreading awareness about the impacts and dangers these college students must navigate, addressing the lack of research on this population, providing resources for these college students to better navigate college life, alongside providing resources to colleges to better support their students, and protocols that ensure the safety of college students with food allergies and intolerances (FA/FI).

CONFIDENCE AND SUCCESS: INVESTIGATING SELF-ESTEEM'S ROLE IN ACADEMIC PERFORMANCE

Presenter(s): Charles, Michael, Undergraduate, Psychology

Mentor: Dr. Dawn McBride

Self-esteem is widely recognized as an influential factor in academic performance, yet existing literature presents conflicting findings regarding the strength and nature of this relationship. Thus, this study aims to broaden our understanding of the effects of self-esteem on college students' academic performance and clarify the contradictions in the literature. Using a sample of students enrolled in a Research Methods in Psychology course, the Rosenberg Self-Esteem Scale will be employed to measure self- esteem. Additionally, academic performance will be assessed through students' scores on their first exam and first major writing assignment. A regression analysis will be conducted to examine the extent to which self-esteem predicts academic performance. It is hypothesized that these two variables will be positively correlated, suggesting higher self-esteem is associated with better academic performance, while lower self-esteem corresponds with worse academic performance. These findings are expected to strengthen our understanding of the impact of self-esteem on academic performance while clarifying contradictions in the literature.

ADOLESCENTS' FAMILY RELATIONSHIP TRAJECTORY CLASSES AND LATER ADJUSTMENT OUTCOMES

Presenter(s): Donnelly, Caitlyn, Graduate, Psychology
McDaniel, Sean, Graduate, Psychology

Mentor: Dr. Laura Finan

Authorship: Sean McDaniel[1], Caitlyn Donnelly[1], Laura Finan[1], Nicole K. Watkins[2]

1) Illinois State University, (2) The Pennsylvania State University, Scranton

*These authors contributed equally to this project.

Background and objectives: Adolescents family relationship experiences are associated with diverse adjustment outcomes, including internalizing symptoms and problems behavior (Buehler, 2020; Cummings et al., 2015; Finan et al., 2018). However, extant research examining these associations has been generally limited by cross-sectional examination of these dynamic family processes, siloed exploration of family interactions and relationship experiences, and omission of heterogeneous subgroups of adolescents. Therefore, in this study, we investigated the heterogenous latent growth class trajectories of family relationships during adolescence and explored differences across these classes with adjustment outcomes.

Methods and Analysis Plan: Data were drawn from the Predictors of Anxiety and Depression during Adolescence (PANDA) Project (Ohannessian & Vannucci, 2018), a large 7-wave study which surveyed demographically diverse 7th and 8th graders every six months from fall 2016 (W1; N=1,347) through fall 2019 (W7). Adolescent-mother (AM) and adolescent-father (AF) reports of open and problem communication, family cohesion, family conflict, family support, and sibling support from W1-W6 and W7 internalizing (depression and anxiety) and conduct problems measures were use in the current study. Parallel process latent class growth models were specified for two- through seven-classes. Intercept and slope means were freely estimated, but variance estimates for the intercept and slope were constrained to zero within each class, so that all participants within each class followed the same trajectory. Associations between growth parameters also were constrained to zero within class. Regression analyses were used to explore associations between class membership and internalizing symptoms (OLS linear) and any conduct problems (logistic), controlling for demographic characteristics and previous W1 outcomes.

Results and Discussion: A four-class solution best fit the data. Class 1 (11.9%) reflected high stable problem AF communication; Class 2 (46.9%) was increasing AF and AM problem communication; Class 3 (13.2%) was stable high AM problem communication; and Class 4 (27.9%) was high family cohesion and open communication. Results from regression analyses indicated that compared to adolescents in Class 4, (a) those in Class 2 and Class 3 reported greater depressive symptoms, those in Class 3 reported greater anxiety symptoms, and (c) those in Class 1, Class 2, and Class 3 reported greater likelihood of conduct problems. These results stress the importance of examining variations in different family dynamics throughout adolescence, and how these different family relationships have implications for adverse adjustment outcomes.

DO YOU KNOW AS MUCH AS AN EXPERT?

Presenter(s): Ervin, Will, Graduate, Psychology
Mao, Charlisa, Undergraduate, Psychology
Mentor: Dr. Alison Nguyen

When people communicate, they aim to produce a mutual understanding between each other, called c*ommon ground* (Clark & Brennan, 1991), and reach an agreement on words and their meaning, as well as other aspects of the conversation, such as authority and certainty.

Gradable adjectives are adjectives that are reliant on the context of the conversation and are words like *straight* and *dangerous*, and thus, vary in meaning depending on the established common ground (Kennedy & McNally, 2005). *Cognitive verbs* notify the listener about the credibility of the statement, and are words like *think*, *know*, and *believe*. Additionally, statements from authority figures seem more credible because of their influence. (Wei, 2024; Schommer- Aikins, 2012). In this study we hypothesis that authority figures and cognitive verbs will alter the meaning of gradable adjectives via certainty, which alters the context. Please compare the statements below.

A) The engineer thinks the material is strong.
B) The engineer knows the material is strong.
C) A person thinks the material is strong.
D) A person knows the material is strong.

Each of the sentences should indicate to the reader different degrees of certainty. Each sentence varies in the cognitive verbs (*believe, think,* and *know)* used and via the presence of an authority figure. Examples (a) and (b) are the *authority* sentences. Engineers are authority figures for subjects regarding engineering, such as materials. However, the usage of *know* or *thinks* should result in varying degrees of certainty, as one is a *booster* (implies certainty) and the other is a *hedge* (implies uncertainty). Therefore, people should be more certain of example
(a) than example (b). The same thing occurs with (c) and (d), however, the status of the person's material expertise is unknown. In (a) and (c), these sentences vary in their credibility depending on if the statement is making reference to the authority figure or not.

Preliminary data suggest that cognitive verbs influenced people's certainty $F(1, 11) = 57.259$, $p < .001$. Cognitive verbs classified as boosters resulted in higher levels of certainty, while cognitive verbs classified as hedges resulted in less certainty. Who produced the utterance also had an effect on people's certainty $F(4, 11) = 2.982$, $p = .044$. Preliminary data suggest that statements made by authority figure resulted in higher levels of certainty than when non- authority figures expressed statements.

PERCEPTIONS OF TRUST IN I.D.E.A. MESSAGING ON CAMPUS

Presenter(s): Etheridge, Emma, Undergraduate, Psychology

Mentor: Dr. Jordan Arellanes

Authorship: Jordan Arellanes, Mike Hendricks, Chang Su-Russell

IDEA initiatives in universities have increased in recent decades across the country. These IDEA initiatives include messages that promote inclusion, diversity, equity, and access. However, the specific strategies for enhancing the authenticity and trust in these messages are unclear. To address this issue, this study was developed to evaluate students' trust in Illinois State University's IDEA initiatives utilizing Rotenberg's (2010) BDT framework of interpersonal trust. There were 70 participants through 16 focus groups in 12 classes through in-class SoTL academic intervention. Three themes of the data were established through inductive/deductive coding. These themes included honesty of IDEA intentions, emotional associations of trust, and reliability of IDEA messaging. Students questioned genuine desires for IDEA on campus, and it was found that the university needs to provide consistent messaging to support honest messaging. Classes that allow for open discussion are very important for students' learning and participation. In addition, follow through and closure after discriminatory events are crucial to fostering trust in the IDEA messaging. A final takeaway of this study was that although universities cannot be expected to prevent all distances of discrimination on campus, they should mitigate the response afterward to ensure trust and confidence in the students that they will not tolerate such actions.

READING COMPREHENSION AS A RESULT OF SYNTACTIC STRUCTURES

Presenter(s): Fletcher, Kelly (she/they), Undergraduate, Psychology
Hernandez, Alexandria (she/her), Undergraduate, Psychology

Mentor: Dr. Allison Nguyen (she/they)

Authorship: Kelly Fletcher, Allison Nguyen

Reading comprehension functions as a reflection of one's ongoing cognitive processes while encoding new information through a text. When the brain is unable to correctly encode information, the effectiveness of one's ability to successfully retrieve it later is impacted, which is shown through reading comprehension scores (Zhang et al., 2018). Comprehension levels can be affected through different factors, such as media multitasking and busy environments, since the brain engages in semantic integration, known as the process of combining cues and information from multiple senses, and this can affect retrieval (Du et al., 2020; Zhang et al., 2018).

This study aims to investigate the relationship between syntactic structures and its' effect on reading comprehension concerning individuals familiar with the English language. Our goal is to analyze how expectations of syntactic structures can affect the accuracy and quantity of informational text encoded into the brain, along with the processing speed of recalling information accurately. We predict that when communicating in English, specific sentence structures, such as the subject-verb-object, are preferred as they convey information in a condensed manner, compared to object-verb-subject sentences. For example, the phrase, "The cat chased the mouse" may be perceived as easier to encode than the phrase "The mouse was chased by the cat," as the first phrase follows a more predictable pattern familiarized to English speakers when introduced to the language (Poulsen & Gravgaard, 2016). When reading content that follows predictable language patterns, participants can absorb greater quantities of information accurately compared to those who encode sentences about the same topic but follow more complicated sentence structures (Brimo et al., 2015). This process is reflected upon within reading comprehension exams, as participants are forced to recognize and recall information previously learned to accurately answer questions related to the text.

This study emphasizes the importance of syntactic structure, especially for those who are not fluent within the English language, as the complex formation of sentences can conflict with one's expectations of the language and the way their brain is able to encode and process new information. This study can be used as a tool in the consideration of developing AI chat bots that are able to communicate with users, as the system often struggles with predictable language patterns and complex syntactic structures, while failing to retain information previously presented.

Keywords: Reading comprehension, encode, syntactic structure, predictable, information

NAVIGATING NON-INTUITIVE DOORS: OBSERVATIONAL INSIGHTS AND IMPLICATIONS FOR BUILDING SAFETY

Presenter(s): Guthrie, Alison V., Graduate, Psychology

Mentor: Dr. Jeffrey Wagman

Building safety relies on the intuitive use of doors, yet many architectural designs incorporate non-intuitive doors that hinder efficient egress. This study examines how people interact with such doors in public buildings, using observational data collected across multiple locations. Where users first contact a door, how they attempt to open that door, whether they are successful in doing so, and how long it takes them to do so were recorded and analyzed. We expect findings to indicate that certain design features will contribute to how quickly and easily doors are operated, potentially contributing to delays, increased cognitive load, and safety hazards during emergencies. Such results will highlight the need for improved architectural design guided by affordance and human factors principles. Enhancing door usability can improve everyday efficiency and, crucially, ensure safer and more effective evacuation in high-stakes situations.

EMPLOYEES' PERCEPTIONS OF WORKPLACE CHANGE AND REDESIGN

Presenter(s): Hindman Katie, Undergraduate, Psychology
Williams, Sarah, Undergraduate, Psychology
Lomelino, Tori, Graduate, Psychology
Hubbard, Emily, Graduate, Psychology

Mentor: Dr. Kimberly Schneider

Authorship: Katie Hindman, Sarah Williams, Tori Lomelino, Emily Hubbard

Purpose: In preparation for a workspace redesign, we collaborated with an architectural group to conduct interviews and focus groups with employees from a social service agency regarding their perceptions of a need for change in their physical workspaces. With an increase in hybrid and remote work options, there is demand for more flexible workspaces. The agency was interested in exploring options for converting office space into more flexible 'touchdown' spaces where employees are not assigned individualized space but could share offices and arrive on flexible schedules, moving between spaces and locations as needed. Focus groups and interviews were conducted to collect employee feedback on workspace needs and perceptions of change.

Project Methodology: We describe themes from employee feedback from focus groups and interviews with 25 employees using questions regarding need for change in their physical workspace, ideal preferences for spaces, and preferences for interacting with coworkers. Most employees described the desire for personalized workspaces, improved storage systems, and a more centralized layout to reduce inefficiencies. In addition, we are currently collecting data from all employees using a standardized survey. Survey assessment is focused on the need for belongingness at work, current workspace and ideal workspace preferences, and employee satisfaction.

Results: Based on interviews and focus group data, we determined from independent observers that 7 themes were discussed regarding concerns with current workspace. These include a lack of personal space, insufficient layout, minimal storage, excessive travel time between locations, accessibility difficulties, and concerns regarding the confidentiality of conversations. We will report preliminary analysis of survey data currently being collected. We expect to find that perceptions of a need for change will predict openness to change as well as higher levels of organizational commitment. We will also examine differences in openness to change and perceived need for change based on age, years with the organization, and job type.

Implications: Our study can inform the social service agency we are collaborating with regarding how to best communicate upcoming changes to employees, as well as how to prioritize the types of changes that are necessary.

INVESTIGATING THE INFLUENCE OF MOOD ON SHORT-TERM FALSE MEMORY FORMATION

Presenter(s): Jodlowski, Vanessa, Graduate, Psychology
Arquilla, Isabelle, Undergraduate, Psychology

Mentor: Dr. Dawn McBride

False memories occur when associative correlates of information are activated upon their presentation, such as semantic or phonological properties of word lists. False memory formation in short-term memory (STM) has shown a dependency on list type, with phonological lists producing more false memories than semantic lists. Research has also shown that mood has the potential to influence the formation of false memories. The present study is looking to examine the effect of list type (semantic vs. phonological) and mood (positive vs. negative) on false memory at a short-term delay between study and test. Participants will complete a baseline mood survey before watching either a positive or negative film clip, followed by another mood survey and a word-list memory task. Finally, a third mood assessment will be given, followed by an amusing film clip to reestablish a positive mood. It is hypothesized that participants in the positive condition will produce higher levels of false recognition rates and that phonologically related word lists will produce higher levels of false recognition. However, this effect is expected to differ depending on the type of list studied. Understanding the relationship between mood and false memory in STM is crucial when considering student learning outcomes and eyewitness statement credibility during interviews or crime investigations.

POLITICAL ORIENTATIONS AND OSTRACISM

Presenter(s): Marcikic, Aidan (he/him), Undergraduate, Psychology
Owens, Angelina (she/they), Undergraduate, Psychology
Hernandez, Alexandria (she/her/hers), Undergraduate, Psychology
Mentor: Dr. Allison Nguyen (she/they)
Authorship: Aidan Marcikic (he/him), Charlisa Mao, Ari O'Connell, Madi Sapp, Kelly Fletcher, Alexandria Hernandez (she/her/hers), Dante Caruso, Allison Nguyen (she/they)

College students are an increasingly large percentage of the voting population, with 66% of college students across 1000 institutions in the United States voting in the 2020 election (Thomas, et al., 2021). Consequently, how college students understand the messaging political parties use to promote their platforms is of utmost importance to understand how they understand political viewpoints and learn to self-identify. Another factor for understanding the relation to politics is ostracism, or how excluded people might feel, as people who feel ostracized are vulnerable to more extreme viewpoints, including political viewpoints and conspiracy theories (Poon et al., 2020; Robertson et al., 2022). We hypothesize that college students who are not reminded of political parties' stances will have a harder time distinguishing between them than those who are reminded.

To examine this, we will conduct an experiment looking at knowledge of political issues and political parties, as well as whether participants feel ostracized based on their political beliefs. Participants will be randomly assigned to one of four conditions where they will be asked to assign political parties to different political stances ("Marijuana should be legal"). For two of the conditions, they will read descriptions of the political parties before responding, with the question about political orientation varying in location (please see Table 1 for details on the four conditions). Each condition will contain a qualitative question regarding participants' level of ostracization given their assigned political orientation. We will have an IRB filed by early November and will finish data collection by December.

We will analyze this data by using a coding scheme to determine the accuracy of participants responses in comparison to political party positions. Then, we will conduct a 2 x 2 ANOVA to compare the four conditions. We predict that giving participants the descriptions of political parties will increase the accuracy of assigning viewpoints to parties and we predict that there will be an interaction between participants' political beliefs and accuracy, such that participants who read the descriptions and provide their viewpoints at the beginning of the study will be more accurate at identifying statements, because the differences between the parties will be the most salient.

Understanding whether college students can correctly identify political stances with parties has implications for how accurately policy statements are being communicated by political parties and can provide insight into one of the fastest-growing groups of voters in the United States.

THE RELATIONSHIP AMONG BODY SATISFACTION, SELF-EFFICACY IN PERFORMANCE AND WEIGHT CONTROL BEHAVIORS IN COLLEGE AGED STUDENTS IN PERFORMANCE ARTS

Presenter(s): McElmury, Kailey, Undergraduate, Psychology

Mentor: Dr. Suejung Han

The purpose of this research is to examine the relationship between body satisfaction and self-efficacy in performance among collegiate students in performing arts. McAuley, Bane, and Mihalko (1995) showed that among a community sample of middle-aged adults, anxiety about body image was negatively associated with physical self-efficacy in exercise tasks, which was improved by increased level of exercise. However, previous research has found that those in performance arts, specifically dancers, experience more negative self-perceptions about their bodies, placing them at higher risk for body dissatisfaction (Gearhart et al., 2018). This same study revealed that approximately half of the participants believed their performance was affected by their weight. These results suggest that body dissatisfaction, particularly based on their weight, may undermine self-efficacy in performance among dancers. The Gearhart et al. (2018) study only focused on dancers; this speculation may also be applicable to those in a variety of performance arts, such as gymnasts, aerialists, and acrobats, because certain body types (i.e., slim with low weight) are deemed more desirable in performance arts and they tend to use form fitting attires. Therefore, I hypothesize that for those who participate in performance arts, body dissatisfaction will be negatively associated with self-efficacy within performance and weight control behaviors. Participants will be college students in a performance based Registered Student Organization at a Midwestern university. Data collection will start in January 2025 upon the IRB approval, with data analysis occurring in March 2025 to be ready to present in April 2025. After giving informed consent, participants will complete a survey through the online platform, Qualtrics. The survey will consist of items from the Body-Esteem Scale for Adolescents and Adults (BESAA) (Mendelson, White, & Mendelson, 1997), modified items from the Athlete Self-Efficacy Scale (ASES) (Kocak, 2020), and the Oxford Food and Activity Behaviors 20-item questionnaire (OxFAB20) (Hartmann-Boyce et. al., 2022). A Pearson Correlation analysis will be conducted for hypothesis testing. This study's results can inform athletes in performing arts and their coaches that addressing body image concerns may be instrumental for enhancing self-efficacy in performance and preventing unhealthy weight control behaviors among these athletes.

OPTIMIZING AAC BOARD LAYOUTS: THE IMPACT OF ORGANIZATION ON COMMUNICATION EFFICIENCY

Presenter(s): O'Connell, Ari, Undergraduate, Psychology
Hernandez, Alexandria, Undergraduate, Psychology

Mentor: Prof. Allison Nguyen

Authorship: Ari O'Connell (she/her), Alexandria Hernandez (she/her), Allison Nguyen (she/they)

Augmentative and Alternative Communication (AAC) is used by 2 million individuals in the United States alone to return communication to those with both temporary and life-long impairments (U.S. Department of Health and Human Services). These AAC boards can be static physical objects where the user must point or otherwise indicate an object, or alternatively, can make use of technology to create an interface between the user and the board (Elshar et al., 2019). Many of these individuals use AAC boards that contain words and pictograms to communicate with conversational partners. The layout of these boards is oftentimes pre-set, and organized by groupings such as "people" - i.e., organized by the semantic content of the words.

Research from lexical access suggests that words are recognized and accessed faster when they are high- frequency (Whaley, 1978), and when they are strongly semantically related to the previous content (Buchanan, et al., 2001). This suggests that boards laid out according to frequency and semantic content will be more intuitive and easier to use for people than boards laid out using other principles.

This study aims to address the gap in the understanding of layout efficiency of AAC devices as they are initially set up for new patients. Three layouts–semantic, alphabetical, and word frequency organization– were chosen and made using Cboard's online website with words related to college. Participants viewed one of the three boards and were instructed to recreate three given sentences with the board to analyze the speed at which participants could recreate given sentences most effectively.

We predict that the AAC boards laid out by semantic content and word frequency will have the fastest times for sentence construction, and that the board laid out by alphabetical organization will have the slowest time for sentence construction.

This has important implications for accessibility. Creating layouts that more closely resemble the ways word recognition happens increases speed, reducing the barriers to communication for people who are using AACs. Because these boards are so widely used, by a variety of people in a variety of situations, boards that are easy to use and require minimal instruction can increase use of this low-cost communication technology.

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IMPLEMENTATION OF A COURSE ABOUT DIVORCE IN HIGHER EDUCATION

Presenter(s): Owusu, Emmanuel, Graduate, Psychology

Mentor: Dr. Julie Campbell

Authorship: Emmanuel Owusu, Julie Campbell

Learning about the impact of divorce on young adults and children may benefit professionals mentoring those who have experienced the turbulence of divorce. Evidence suggests that a high proportion of people in the United States are affected by divorce. Most have experienced divorce directly or indirectly within their immediate family or friends (Aberg, 2011). The preponderance of negative effects of divorce on child and adolescent development is well documented (Cano & Gracia, 2022). Adolescents and emerging adults who experienced their parents' divorce may not experience typical developmental milestones in the same way as those from non-divorced families (Dykes & Ward, 2022).

Courses may exist at the graduate level within a specific field of study for those training to become professionals working with individuals going through divorce. Some undergraduate courses in the social sciences include a limited component covering the family dynamics of divorce. However, many professionals teaching adolescents may have knowledge of the effects of divorce or that awareness can create empathy for those experiencing this trauma. Becoming aware of the effects of divorce on an emerging adult can assist those in higher education to strengthen their knowledge of those they teach.

This project documents the implementation of a course centered on the topic of divorce. An honors course was taught in which students were exposed to several topics surrounding divorce and asked to examine their own beliefs about the topic. Students engaged in activities in which they analyzed the relation between parents' marital status and society's resulting view of a child. Students examined how milestones during adolescence can be affected by parents' marital status and family structure. Students examined historical and modern patterns of relationships, marriage, and divorce. The course also included the identification of problems faced by modern marriages and the social and environmental factors that play a role in divorce culture. A summary of the students' demographics and their reflections about the class are presented.

THE EFFECTIVENESS OF A MICROAGGRESSION TRAINING SERIES FOR HIGH SCHOOL STUDENTS

Presenter(s): Rivera, Giselle, Graduate, Psychology
Sierra, Bianca, Graduate, Psychology

Mentor: Dr. Brea Banks

Authorship: Giselle Rivera, Bianca Sierra, Brea Banks

Microaggressions are everyday interpersonal slights enacted against individuals holding minoritized identities that have documented negative effects (Solórzano & Perez Huber, 2020). Most of the literature has focused on the experiences of adults, and even less research has focused on the effectiveness of trainings to combat microaggressions.

We used a quasi-experimental design and sampled students in general psychology classes at two Midwestern high schools. Four classrooms at one school were assigned to the experimental group (i.e., received the training), and two classrooms at another school in the same district were in the control group (no training). Before the training, all participants completed a pretest survey that assessed demographic variables, knowledge (i.e., definition, types, and examples of microaggressions, reasons for why they are harmful, and productive ways to react as a receiver, witness, or perpetrator). Participants also completed well-established measures to assess their experience with race- and sexuality-based microaggressions. The experimental condition was then exposed to the 6-session training. Following the training, all participants completed the posttest survey.

We are still engaged in data coding and analyses but have conducted some preliminary analyses. Using a RM-ANOVA, time and condition interact to predict improvement in knowledge for the experimental condition specifically relevant to Sue's (2017) taxonomy of the types of microaggressions, Wilks $\Lambda = 0.61$, $F(1, 75) = 47.05$, $p < .001$, $\eta p^2 = .39$. We will conduct additional RM-ANOVAs to examine within and between subjects changes in the other specified variables after the completion of coding this spring.

This is the first known study to examine the impact of a microaggression training for high schoolers. The results will add to the microaggression literature and are directly relevant for school psychology practice. As part of the session, we will discuss the implementation of the training, as well as specific implications for practitioners.

ADVERSE CHILDHOOD EXPERIENCES AND ADOLESCENTS' SENSE OF SELF OUTCOMES: THE MODERATING ROLE OF STUDENT-TEACHER RELATIONSHIPS

Presenter(s): Spraggon, Meredith, Graduate, Psychology

Mentor: Dr. Laura Finan

Authorship: Meredith Spraggon

This study investigates the intricate interplay between adverse childhood experiences (ACES), sense of self outcomes, and student-teacher relationships (STR). Utilizing a sample of 271 undergraduate students from a Mid-Western state, the research investigates the associations between ACES, self- esteem, social self-efficacy, and the role of STR as potential buffers against adverse outcomes. The findings revealed a high prevalence of reported ACES among participants, emphasizing the urgency to understand mitigating factors such as teacher relationships. Consistent with existing literature, ACES exhibited negative correlations with both self-esteem and social self-efficacy, underlining their detrimental impact on psychological well-being. Additionally, the study unveils a positive association between high school STR and college students' sense of self, indicating the enduring influence of such relationships. Despite not finding significant moderation effects, the study underscores the pivotal role of teacher relationships in bolstering student well-being. These insights advocate for educational interventions emphasizing supportive teacher-student dynamics to foster positive developmental outcomes despite early adversities.

INVESTIGATING PRECRASTINATION IN ACADEMIC SCENARIOS

Presenter(s): Szkapiak, Sadie, Undergraduate, Psychology

Mentor: Dr. Dawn McBride

Authorship: Sadie Szkapiak

Precrastination describes a tendency to complete a task as soon as possible, even when doing so has negative consequences. Previous studies have primarily measured precrastination using a bucket-moving task. The present study examines whether precrastination occurs in academic contexts as well. Participants were asked to consider several hypothetical scenarios involving academic tasks. Variation in the deadline of the assignment, (5, 7, 10, 14, or 30 days) and task length (short or long) were manipulated across scenarios. Additionally, participants completed the traditional bucket-moving task that has shown precrastination in past studies (e.g., Rosenbaum et al., 2014). Results will be analyzed to test if precrastination is seen in academic scenarios. Additionally, we will examine whether precrastination in academic tasks is associated with behavior in the bucket-moving task.

TRUST IN PERSONALITY TESTING

Presenter(s): Taylor, Sean, Undergraduate, Psychology
Tampa, Lindsey, Undergraduate, Psychology

Mentor: Dr. Burak Ozkum

Authorship: Kara Cannon, Sean Taylor, Lindsey Tampa, Burak Ozkum

One's inherent trust in the perceived accuracy of personality test results may rely upon several culturally dependent variables of a population, including the need for cognition, skepticism, confirmation bias, pseudoscientific beliefs, and general self-awareness, which may be exhibited with several degrees of variance between cultures. The present study seeks to replicate the "Trust in Personality Test Results and Associated Factors" project conducted in a Turkish I/O Psychology workshop to discern cultural idiosyncrasies in their trust in personality testing, particularly between Turkey and the US. Participants (n = 250) responded to a personality inventory based on the Meyers-Briggs Type Indicator framework, the NERIS Type Explorer or the "16Personalities Test", before being randomly assigned to one of three conditions which determined the degree to which their MBTI type was accurate (accurate result, adjacent result, opposite result). Participants then responded to a form collecting data regarding their level of agreeableness regarding pseudoscientific beliefs. The present study seeks to determine if the results from the Turkish sample can be replicated within the US sample based upon potentially influential cultural variables between the two populations, and we expect response patterns to vary relative to the assigned condition (accurate result, high trust). We seek to explore two possible outcome explanations; If the Barnum effect, a variable influencing response patterns to be more agreeable to general descriptives is present, irrelevant of the accuracy of feedback, respondents will trust their results. Conversely, the trust of respondents will result from the accuracy of the feedback (no Barnum effect/well developed test). As the study is finalizing data collection, results are hitherto not available but will be for the symposium.

GENDER NORMS AND VIOLENCE: ATTITUDES TOWARDS RAPE AND INTIMATE PARTNER VIOLENCE IN NIGERIA

Presenter(s): Ebubechukwu, Mmeri Patricia, Graduate, Sociology/Anthropology

Mentor: Dr. Winfred Avogo

Societal norms are deeply rooted in attitudes towards Gender Based Violence. Different societies have cultures distinct to them that influence Nigerian individuals. Socio-cultural norms play a critical role in shaping attitudes towards gender-based violence. In Nigeria, diverse ethnic, cultural, and religious traditions influence individual and collective perceptions of GBV, including rape and intimate partner violence (IPV). This study examines the interactive effects of gender norms on attitudes towards IPV across various ethnic groups in Nigeria. It also explores the influence of cultural and religious institutions in shaping legal frameworks and societal responses, determining whether GBV is tolerated or condemned.

This study uses Pierre Bourdieu's theory of practice, especially because of its two important concepts that are deemed relevant to this study, which are meaning and cultural capital. Habitus is the way by which one internalizes and perpetuates a society's norms and values as they relate to the roles of gender in such a way that people come to normal or abnormal attitudes towards Gender Based Violence. On the same note, it will also open up the discussion on the different powers within such cultures and societies response to Gender Based Violence.

Much of the existing research on the determinants and mechanisms of gender-based violence (GBV) has been conducted outside Africa, limiting the development of context-specific policy interventions. This study is essential for understanding how cultural and religious beliefs shape attitudes towards GBV in Nigeria. It examines the roles of traditions and legal systems in either reinforcing or challenging GBV, highlighting the profound influence of societal norms on perceptions of violence. Additionally, this study explores how these harmful gender norms are passed down and normalised in society; it also considers Nigeria's ethnic and cultural backgrounds, offering an intersectional view of GBV.

The main focus of this study is on ethnic differences in gender-based violence in Nigeria- specifically differences in gender norms, cultural and religious practices, family structure, socio- economic status and women empowerment between the ethnic groups in Nigeria.

The study uses secondary data drawn from the Demographic and Health Survey (DHS) conducted in Nigeria in 2018. We use descriptive statistics and multivariate techniques to examine the social determinants of gender-based violence among the major ethnic groups in Nigeria. This study seeks to uncover the cultural, social and institutional factors influencing attitudes toward Gender-Based Violence (GBV) in Nigeria. The findings aim to provide an understanding of the interplay between gender norms and legal frameworks in shaping perceptions of GBV.

INTERFAITH MARRIAGES: EXPLORING THE ROLE OF UPBRINGING AND LIVED EXPERIENCES ON INTERFAITH COUPLES' RESPONSES TO STEREOTYPES AND UNION DECISIONS

Presenter(s): Gogoi, Meghna, Graduate, Sociology/Anthropology

Mentor: Dr. Marion Willetts

This study on interfaith marriages is a fine example of the micro-macro linkage that we seek to make in sociology. Marriage is a "primary," intimate relationship but one that increasingly involves "intermarriage" across lines of race/ethnicity, religious and cultural backgrounds. Interfaith marriages, which refer to unions between individuals from different religious backgrounds, are becoming very common in today's contemporary society. Therefore, it is relevant to understand the experiences of couples in an interfaith marriage. This study explores how upbringing and lived experiences shape the ways interfaith couples respond to stereotypes and make decisions about their union. This study tries to understand the motivations to participate in an interfaith marriage despite societal resistance. I have found a relative lack of attention to the interpretive, contextual understanding of "interfaith marriage," still less that focuses on the marriage dyad as the unit of analysis. Therefore, I conducted online Zoom interviews with five interfaith couples by interviewing both spouses separately who are living in the United States and belong to Christian, Hindu, or Muslim religious backgrounds. These interviews explore how both spouses navigate cultural and religious differences, deepening my understanding of the interplay between individual agency and structural forces. This qualitative approach acknowledges the unique cultural, social, and personal contexts of each partner, providing a comprehensive understanding of their experiences. Also, I hope and believe that my future findings may also inform clinical/counseling professionals who must deal with the array of issues surrounding the couple that shape the quality and longevity of such marriages.

THE DEVELOPMENT AND TRANSMISSION OF NUT-CRACKING AND STONE-KNAPPING SKILLS IN YOUNG CHILDREN

Presenter(s): Salmons, Heather, Undergraduate, Sociology/Anthropology

Mentor: Dr. Shelby S. J. Putt

Authorship: Heather Salmons, Shelby S. J. Putt

One of humanity's defining features is the ability to transmit skills and behaviors through social learning, starting from a young age. The archaeological record of stone toolmaking offers some insights into the evolution of this feature; however, there is little research done on children's stone toolmaking abilities. A sample of 14 preschool-aged children participated in a study focusing on two stone tool-related tasks involving the extraction of a toy prize: a puzzle box , requiring a knapped flake to open, and an artificial nut, requiring a hammerstone to crack it open. The children were assessed on their working memory capacity and the effect this had on how they solved each task under three different learning conditions (insightful problem solving, reverse engineering, and imitation). Productivity, efficiency, and expediency at each task were used to measure success in relation to their working memory size. Participants were successful at the nut-cracking task under each learning condition, and working memory size had no detectable effect on their performance. However, there was significant improvement on the knapping task between the asocial and social learning conditions, and there was a significant positive correlation between knapping task success and working memory size. Therefore, social learning may be necessary for hominins with a limited working memory size to successfully transmit knapping behaviors due to the complexity of the task. These results support an early emergence of complex social learning in human evolution.

DEAF/HARD OF HEARING EARLY CHILDHOOD EDUCATION MOVEMENT AND MATH STUDY

Presenter(s): Czirjak, Annie, Undergraduate, Special Education

Mentor: Dr. Christy Borders

Co-Mentor: Dr. Michelle Gremp

Authorship: Annie Czirjak, Christy Borders, Michelle Gremp, Julien Corven, Mary Henniger, Skip Williams

Language acquisition is directly related to number learning because of the strong correlation of vocabulary to number word learning. Deaf/hard of hearing (DHH) students who receive delayed exposure to language tend to fall behind their hearing peers in mathematics even though DHH individuals have the same foundational, non-symbolic cognitive systems that lay the foundation for mathematical development and a similar ability to learn from perceptual experience (Shusterman & Peretz- Lange, 2022). Through this research study, the team of researchers will be examining the impact of various math activities incorporating movement on Deaf preschool students' counting, subitizing (quickly and fluently recognizing sets without counting individually), and problem-solving. Participants' problem-solving, subitizing, and counting will be measured across conditions such as fine motor vs. gross motor activities; nonacademic movement prior vs not; and balance/coordination vs. reaction time activities. There is a strong link between body and mind in learning, so by increasing movement in the classroom, children are more actively engaged, and their brains are better prepared to learn (Kosmas et al., 2019).

The research team, which will be working closely with preschool DHH teachers, comprises faculty across various disciplines, including early childhood math, math education, physical education, and education of the deaf and hard of hearing, as well as two teacher candidates in the DHH program. The team will meet two times a week for one and a half hours with rotating conditions to see whether movement affects math acquisition in young DHH students. The students will be broken up into three groups, each group receiving a different treatment, and they will rotate treatments monthly. The groups will be broken up into fine motor math, gross motor math, and gross motor with no math. The alternating treatment design will allow researchers to evaluate and compare the conditions. Through this study, we are looking at three specific questions: 1) What is the impact of regular math activities incorporating movement on problem-solving, counting, and subitizing in preschool DHH students? 2) What do teacher candidates who are involved on an interdisciplinary team delivering math activities incorporating movement to DHH preschoolers see as benefits and obstacles to their teacher training? 3) How does engagement in this project impact selfefficacy to teach math to DHH students for DHH preschool teachers and teacher education candidates? Individual students will be analyzed to discover the possible effects of movement and to inform future math instruction for those students.

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LECTURES OF LANGUAGE: THE LONG-TERM EFFECTS ON ELL STUDENTS' MENTAL HEALTH

Presenter(s): Guzman, Jasmine, Undergraduate, Teaching and Learning

Mentor: Dr. Miranda Lin

There is plentiful research in the field of education about English Language Learners (ELLs) in the U.S. Throughout history, there have been extensive policy changes that have evolved for ELLs in the classroom. These have been essential to creating an effectively inclusive environment for all students, no matter their upbringing. The literature review focuses on the long term effects the current ESL programs might have on ELL students as they grow older guided by Bronfenbrenner's ecological theory (1979). Bronfenbrenner's theory emphasizes the learner's context in various systems. Although students often transition out of English as a Second Language (ESL) programs once proficiency is tested and demonstrated, there are continuous impacts on these students even subsequently. In this literature review, I assess different educational policies and ideologies in history and how these affect multilingual learners in the classroom. Additionally, I research ELL student outcomes and how being in ESL programs specifically impacts their mental health later on. To conclude, I look at these correlations and focus on what teachers can do to ensure the most effective and beneficial experience for ELL students and their mental health throughout their education and later on.

TECHNOLOGY IN THE SECOND LANGUAGE ACQUISITION CLASSROOM: ATTITUDE, PERCEPTION, AND PREPAREDNESS OF LANGUAGE TEACHERS IN GHANAIAN IB SCHOOLS

Presenter(s): Tay, Amanda, Graduate, Teaching and Learning

Mentor: Dr. Anna Smith

The integration of technology in education has become increasingly essential, particularly in the wake of the COVID-19 pandemic, which forced schools worldwide to rethink traditional teaching methodologies. In the Global South, including Ghana, school closures accelerated the adoption of online learning, challenging both educators and students to adapt to digital tools that were previously underutilized in educational settings. Since then, technology has become an integral part of teaching, requiring educators to continuously enhance their digital literacy. This is particularly evident in Ghanaian International Baccalaureate (IB) schools, where the curriculum explicitly prescribes the use of technology to improve teaching and learning outcomes.

Despite the emphasis on technology in IB schools, many language acquisition teachers struggle with its integration. As a former IB language teacher and Head of the Language Acquisition Department, I observed firsthand the difficulties some colleagues, particularly older educators, faced when using digital tools. Their frustration with new technologies in lesson planning and instruction highlighted a need to examine the attitudes, perceptions, and preparedness of language teachers regarding technology use in IB schools in Ghana.

In this study, I employed a mixed-methods approach, combining quantitative and qualitative research to provide a comprehensive analysis of the issue. A survey was conducted across selected IB schools in Ghana to gather large-scale data on teachers' perceptions of technology and the factors influencing their integration of digital tools. This was followed by in-depth interviews with selected participants to gain deeper insights into their experiences and perspectives.

The findings reveal four key insights: (1) Teachers generally feel prepared to use technology, primarily due to their self-motivated efforts to stay updated; (2) While teachers maintain a positive attitude towards technology, resistance persists, irrespective of age, education level, or teaching experience; (3) There is a strong demand for specialized professional development, particularly in advanced digital tools and troubleshooting; and (4) Infrastructural challenges, such as limited resources and unreliable internet, remain significant barriers to effective technology integration.

To address these challenges, I would like to recommend targeted training programs focusing on troubleshooting, graphic design, and advanced educational technology, particularly for language instruction. Additionally, structured mentorship and technical support should be strengthened to ensure equitable access to professional development. Finally, systemic changes—including policy support, investment in digital infrastructure, and strategic planning—are necessary for the successful

integration of technology in IB language classrooms in Ghana. By addressing these barriers, educators can be better equipped to leverage digital tools to enhance language learning.

STUDENT SUCCESS COURSES INTRODUCING STUDENTS TO THE MAJOR DEPARTMENT

Presenter(s): Campbell, Claire, Undergraduate, Physics

Mentor: Dr. Matthew Hagaman

Authorship: Szymon Lucer

Students who have early introductions to their department and its resources, personnel, and opportunities are more likely to feel a sense of belonging, increasing departmental retention. Departments or schools at ISU can provide students with these introductions through student success courses.

In Fall 2024 and Spring 2025, ISU Inclusive Excellence STEM Ambassadors conducted faculty interviews and student focus groups, identifying ideal models for student success courses introducing students to the major department.

This work led to a greater understanding of the approaches being taken in these courses in different departments or schools across campus, from bringing research faculty and community members into the classroom to sharing school or department resources that might otherwise go underutilized.

This work also led to a record of students' hopes for these courses and an accounting of students' reactions to proposed course changes in ISU's School of Biological Sciences.

PROJECT 7408 - GAMIFYING THE LEARNING THROUGH IMMERSIVE VIRTUAL REALITY

Presenter(s): Clark, Alex, Undergraduate, Technology
Coomans, Jack, Undergraduate, Technology

Mentor: Dr. Isaac Chang

Co-Mentor: Prof. Jordan Osborne

IC 7408, a chip widely used in digital circuits and programmable logic controllers, is a good candidate for learning logic design. Nevertheless, the domain knowledge could easily overwhelm the novice, especially when considering the relationship between the chip's operating principles, the interpretation of a given schematic, and the construction of the physical circuit.

This presentation will report a preliminary study using an immersive virtual reality (VR) environment to gamify the students' learning of IC 7408. The learning experience is built upon the escape room scenario, where the learner will be required to solve multiple IC 7408 operating principles puzzles. By visualizing how the component works, the learners will learn how to use the virtual chip to build a logic circuit. Since the learner is "miniaturized" in the VR environment, interacting with items in the room and plugging the water-hose-like electrical wires to power the items could be an exciting experience and might help reinforce learning.

We will discuss how the learning assessment will be performed by measuring the learners' speed and accuracy in constructing the same logic circuit with the physical IC 7408. A post-test survey will be deployed to determine the learners' knowledge retention and individuals' self-efficacy in this subject. We will conclude the presentation with lessons learned and future work.

USING DRIVER DECISION - MAKING PATTERNS FOR DRIVING SIMULATOR VALIDATION

Presenter(s): Darne, Harish, Graduate, Technology
Wisniewski, Marc, Undergraduate, Technology

Mentor: Dr. Isaac Chang

This study aims to validate a virtual reality (VR) driving simulator by comparing drivers' decision- making patterns in the immersive virtual environment with those observed in real-world driving conditions. The goal is to assess whether the driving simulation accurately replicates the driver's cognitive loads and behavioral responses to various driving scenarios. To increase the fidelity of the simulation, traffic density, pedestrian crossing, weather conditions, and signals are adjustable within the VR environment.

We will report the methodology, including the VR simulation setup, participant demographics, and data collection. The driver's decision-making patterns will be evaluated with the participant's eye movement, pedal inputs, steering behaviors, and biometric feedback. The participant's behavior measures will include reaction time, braking intensity, lane-change pattern, and speed regulation. Cognition load & stress level will be measured by eye-tracking data and heart rate variability. Statistical tests, including paired t-tests and Pearson correlations, are used for data analysis. Preliminary findings and lessons learned will be reported.

THE OREGON SOLAR PATHWAY: ENERGIZING CAMPUS SUSTAINABILITY

Presenter(s): Das, Daya, Undergraduate, Technology
Mears, Joe, Undergraduate, Technology
Sheridan, Orla,Undergraduate, Technology
Hiclin, Gavin, Undergraduate, Technology
Delfino, Josh, Undergraduate, Technology

Mentor: Dr. Jin Jo

This project aimed to decrease reliance on grid electricity by implementing on-site solar energy production at the University of Oregon. The primary objective was to enhance the efficiency of solar photovoltaic (PV) systems to offset the energy consumption of nearby buildings and electric buses on campus. Our approach involved analyzing potential installation locations and optimizing system size to align with electrical demand while preventing energy meter overloading. We selected a combination of efficient modules and inverters that were practical for the specified meter configurations and array positioning.

This methodology enabled us to design an optimized solar array and predict energy production in kilowatts. We employed a quantitative financial analysis tool from the National Renewable Energy Laboratory (NREL) to evaluate financial viability, incorporating data on electrical load and energy consumption. This analysis was instrumental in identifying the most cost-effective module and inverter options for our project. Our study thoroughly assessed various sites across the university, weighing their advantages and constraints to determine optimal locations for solar panel installation. A key aspect of our project's design was ensuring that the solar array had at least partial visibility to the public, promoting the University of Oregon's commitment to sustainability and illustrating the investment in creating a cleaner campus environment.

DESIGNING AN ARDUINO-BASED NAVIGATION ASSISTANT FOR VISUALLY IMPARED INDIVIDUALS

Presenter(s): Deslaurier, Nolan, Undergraduate, Technology
Black, Jayde, Undergraduate, Technology

Mentor: Dr. Isaac Chang

This presentation covers an ongoing project to develop an on-body unit (OBU) to assist visually impaired individuals with campus navigation. The OBU continuously scans the surroundings using autonomous driving technology and delivers real-time navigation guidance. The Arduino-based navigation assistant can improve mobility and safety for blind or low-vision users by combining object identification, lane keeping, and collision detection. Auditory and haptic feedback will be used to guide the user's movement.

We will discuss the project background, problems to solve, and the initial results. The operating principles of the following functions will be described: (1) Evaluate alternative travel paths based on real-time road conditions; (2) identify objects and lanes for auditory instruction; and (3) detect potential collision and provide action or maneuvering strategies. Preliminary results will be reported, and the project outlook and lessons learned will be discussed.

DATA MANAGEMENT AND SECURITY STRATEGIES IN COMPANIES' PROJECT MANAGEMENT: A MULTI-COMPANY INVESTIGATION

Presenter(s): Ekeiwu, Marycynthia, Graduate, Technology

Mentor: Dr. Pranshoo Solanki

In an era defined by the exponential growth of digital data and the increasing sophistication of cyber threats, effective management and data security have become mission-critical for organizations across diverse industries. The companies featured in this study have recognized the strategic importance of implementing robust and stringent data management and security measures to protect their internal and client data. This paper aims to examine the data security and management strategies employed by these organizations and identify industry-wide data management and security systems used in project management. A mixed research methodology which includes literature reviews, a combination of in- depth interviews and surveys collected from IT professionals working for various companies (Caterpillar, State Farm Insurance, Illinois State University IT, Country Financial, R.R. Donnelley, etc.,) This is an ongoing study, and preliminary findings indicate that these companies incorporate cutting- edge technologies for data security throughout project life cycles.

Keywords: Data management, Security strategies, Data security, Project Management

THE ROLE OF INNOVATION IN REDUCING UNEMPLOYMENT THROUGH JOB CREATION, ENTREPRENEURSHIP, AND WORKFORCE ADAPTATION

Presenter(s): Kinoti, Hildah, Graduate, Technology

Mentor: Dr. Sally Xie

Unemployment is one of the most pressing global challenges, worsened by rapid technological advancements and economic upheavals. Yet, within this challenge lies a powerful opportunity: innovation. Innovation has the potential to not only disrupt but also transform labor markets, create entirely new industries, and drive sustainable economic growth.

This study explores how innovation reduces unemployment through job creation, entrepreneurship, and workforce adaptation. Employing a mixed-method approach, including case studies and surveys, it identifies critical factors such as educational reform, inclusive policies, and public-private collaboration in maximizing the employment benefits of innovation.

The findings underscore that while innovation can displace traditional roles, it simultaneously creates pathways for entrepreneurs and upskilled workers to thrive in new opportunities. This research offers actionable strategies for bridging resource gaps, nurturing entrepreneurial ecosystems, and aligning workforce development with emerging technological trends. By doing so, it aims to guide policymakers, educators, and industry leaders in leveraging innovation as a transformative force for inclusive economic growth and resilient labor markets (Schumpeter, 1942; World Economic Forum, 2020; Autor & Salomons, 2019).

TECHNO-ECONOMIC ANALYSIS OF INSTALLING LED LIGHTING, SOLAR, AND BATTERY STORAGE THROUGHOUT A MANUFACTURING FACILITY

Presenter(s): Markham, Matthew, Undergraduate, Technology

Mentor: Dr. Jo Jin

A manufacturing company leading in industrial equipment manufacturing, specifically steel and vacuum tanker manufacturing, is exploring the economic feasibility of implementing sustainable energy solutions at its facility. This research evaluates three key initiatives, along with four important case studies: retrofitting outdated lighting with energy-efficient alternatives, installing a solar farm on company property, and incorporating a battery storage system. The study aims to determine these investments' financial and operational benefits while assessing potential cost savings, return on investment (ROI), and environmental impact. The research methodology involving environmental impacts remained stern and was used to determine any benefits. The first case study assessed current energy consumption, upgrade costs, and projected savings from LED or other high-efficiency alternatives already in place. The second case study presented the savings, costs and other profits of replacing all existing halogen lighting with LED's. The third case study examined solar farm feasibility and examine site-specific solar potential, installation costs, available government incentives, and expected energy generation. Additionally, battery storage was studied as part of the fourth case study for its ability to charge, reduce peak demand charges, and optimize solar energy generation. These findings suggest that upgrades should kept being made, as well as that LED lighting offers a rapid payback period through reduced electricity consumption and maintenance costs. The solar farm presents long-term savings and potential revenue generation through net metering programs. However, its economic viability depends on capital costs and incentive availability, as incentive rates are decreasing. Battery storage, while enhancing energy security and grid independence, depending on an off grid or on grid system, requires careful financial modeling to justify its investment. By integrating these sustainability measures, this manufacturing company can lower operational costs, reduce carbon emissions, and improve energy efficiency. The research presented a detailed financial projection, helping the company make informed investment decisions. Final recommendations were outlined with the most cost-effective path to achieving energy efficiency and sustainability goals.

POWERING OUTSIDE THE LINES: WHY REDBIRDS SHOULD ELECTRIFY GRIDLESS NAVAJO HOMES

Presenter(s): Navickas, Tommy, Undergraduate, Technology
Mentor: Dr. Jin Jo
Authorship: Tommy Navickas, Jin Jo

Of the 15,000 U.S. homes without access to the power grid, more than 13,000 reside in Navajo Nation, spanning four states and 27,000 square miles. By the time many of Navajo Nation's PK-12 students arrive home after lengthy bus rides, they must complete their schoolwork by lantern. The humanitarian issue rests largely unaddressed, but change is afoot. A collaboration between Solv Energy, Heart of America, and California Polytechnic State University (Cal Poly) in San Luis Obispo titled Skip-the-Grid empowers college students to install 1 kWh solar battery systems for unelectrified Navajo homes. The work takes place during Cal Poly's spring break, and students receive course and service credits for their work. Since 2022, they've installed 60 systems, but they need help to make a larger impact. Enter Illinois State. Redbird staff were invited observe the Skip-the-Grid project in 2025 with the goal of adapting it for Illinois State University students by the 2025-2026 school year. The experiential learning project is interdisciplinary, involving technical training, professional communication, cultural learning, and a teaching component. College students present a lesson on the importance of renewable energy to elementary-level students at a Navajo school. Through the creation of an independent study, this opportunity would bring value to Redbird student experiences across programs at both the undergraduate and graduate levels. The work empowers students to improve the lives of others while receiving an immersive understanding of an underreported domestic crisis.

STRATEGIES FOR PROMOTING STUDENT-FACULTY CONNECTIONS AND FOSTERING STUDENT SUCCESS

Presenter(s): Swinford, Rylie, Undergraduate, Geography, Geology, and the Environment

Mentor: Dr. Matthew Hagaman

Students who feel connections with faculty have reported higher belonging, which has a strong correlation with student success, as measured through GPA, retention, and graduation rates. Even in large classes with students whose knowledge and skills vary, strategies to promote positive student-faculty connections can lead to improved learning outcomes and greater student success.

In Spring 2024, ISU Inclusive Excellence STEM Ambassadors interviewed 33 first- and second-year STEM students asking for their advice to future students, instructors, advisors, and administrators. The frequency of themes in student responses highlighted what was most important to students: a need for students to get involved and reach out for help earlier as well as a desire for faculty to meet students where they are in their current knowledge. These themes emphasized a desire for student-faculty connections, leading to a new study.

In Fall 2024, the STEM Ambassadors conducted surveys to capture perceptions of connections from both ISU students and faculty members. Following email invitations, 75 students and 49 faculty responded. Both qualitative and quantitative results showed that students and faculty value connections and that both groups recognize challenges building and maintaining connections in large and general education courses. Students and faculty rate connections at present as neutral; however, there also appears to be a disconnect between faculty intent and student perceptions. Based on student and faculty responses and with support from literature, five big ideas for forming connections were identified: being approachable, being responsive, encouraging investment, giving classes a conversational focus, and reaching outside of the classroom.

There are clear steps related to each big idea that both students and faculty can take to better leverage connections in the classroom. With increased application of these strategies, measures of student success including GPA, retention, and graduation rates can all be positively impacted, and student success may lead to successes further in the future.

VACATION PLANNER

Presenter(s): Tucker, Jack, Undergraduate, Communication Sciences and Disorders

Mentor: Dr. Elahe Javadi

Problem/Opportunity

Forming a vacation takes a lot of research, time, and sketchy websites. When looking for hotels or activities for a trip, scouring the internet can take hours. Using the power of ai, gathering all of that information as well as it being catered to your interests grants us a huge opportunity to grow the traveling industry.

Major Features of Your Prototype, LLM, Tools

Ability to find hotels, or living conditions for your trip in specific places. Ability to find activities for a trip depending on your interests (outdoors, arts, history).

Benefits of The Project

This project can enhance how people travel, creating catered vacations for each singular person.

Potential Audience

The potential audience would be young adults and older who love to travel across the world but aren't familiar with what is available in the different locations regarding living and activities

Costs, Learning Time, Risks

There shouldn't be any cost or high learning time or risks involved with this project, other than getting data from the internet for finding hotels, air bnbs or other living situations.

REDEFINING THEATRICAL PRACTICES FROM COLOMBIA'S INDIGENOUS

Presenter(s): Alexander, Michelle, Undergraduate, Theatre, Dance, and Film

Mentor: Dr. Le'Mil L. Eiland

Authorship: Michelle Alexander

La Yonna, a traditional dance of the Wayuu, and *La danza Jepa*, a dance adaptation of the traditional healing movement of the Emberá-Chami, are both Columbian dance practices built upon ancestral indigenous customs that are performative in nature. While these dances can be seen today at native dance conventions and competitions in Colombia, they are history and culture preserved. These matrilineal tribes demonstrate different ways that culture survives under oppressive structures and further expose the falsehood behind the claim that "Spain brought theatre to South America". These two distinct dances from Colombia present the power behind femininity in their cultures. Practices common to indigenous populations pre-colonization seldom utilized the word "theatre" to define them, however, does that mean they are not theatre? The theatre zeitgeist often leaves dance or "ritualistic" performances out of its definition despite the rich history of their conceptual integration. By including their practices as part of the "theatre canon", we further debunk the assertion that femininity is a "weak" or "demeaning" trait, as has been previously pushed by feminine stereotypes in theatrical spaces (i.e. the ingenue, the damsel in distress, the blonde, etc.). For these dances to best dispel the misconceptions that theatre was brought to South America by the Spanish, we must first review and revise the definition of 'theatre'. This research seeks to highlight the importance of indigenous and gender studies as it pertains to theatre with the goal of encouraging cultural compassion and diversifying the canon.

EVALUATING APPLIED THEATRE INTERVENTIONS: A CASE STUDY OF THE ASUBOA PROJECT

Presenter(s): Igwe, Fredrick, Graduate, Theatre, Dance, and Film

Mentor: Dr. Derek Munson

Authorship: Fredrick Igwe

The efficacy of applied theatre remains a subject of debate, with some arguing that it fails to bring about meaningful change, while others, drawing on Augusto Boal's philosophies, view it as a powerful tool for transformation. A key issue fueling this debate is the challenge of evaluating impact, as no universal method exists to measure outcomes. My research highlights the necessity of context-specific metrics to assess applied theatre's effectiveness. I developed an evaluation framework for the Asuboa Project, one of my earliest applied theatre experiences in Africa that measures short- and long-term impacts at both community and individual levels. Using the Asuboa Project as a case study, my research traces the development, practice, and influence of applied theatre and argues that meaningful assessment requires evaluation tools tailored to specific contexts.

Oral Presentation Abstracts

PHYSICS

EFFECT OF THIRD-ORDER PHASE ON THE PHOTOELECTRON MOMENTUM SPECTRUM AND IONIZATION TIME DELAY IN A HYDROGEN ATOM AND DIATOMIC MOLECULE

Presenter(s): Aygun, James, Undergraduate, Physics

Mentor: Prof. Allison Harris

Any The recent development of attosecond laser pulses has allowed for the ability to probe the dynamics of electrons inside atoms and molecules. Attosecond lasers allow us to study photoionization, during which a short, high intensity laser pulse causes the emission of an electron from an atomic or molecular target. One long-standing question is whether photoionization is instantaneous. It has been recently demonstrated that the photoionization process does not occur instantaneously and that it requires a finite time (called the ionization time delay). Additional studies using sculpted laser pulses, such as Airy pulses, have indirectly indicated that the ionization time may be dependent on the pulse's spectral phase, allowing for control of electron dynamics on very short time scales. In order to directly determine the effect of the spectral phase on the ionization time delay, we have developed computational models for attosecond streaking. We will present results from our models for the ionization time delay in a hydrogen atom and a diatomic hydrogen molecule using Airy pulses with varying spectral phases. One consequence of the Airy pulse's spectral phase is that the temporal envelope of the pulse is asymmetric. To determine the effects of this asymmetry on the ionization time delay, we also use our models to examine the symmetry of the photoelectron momentum spectrum and compare results to those for symmetric Gaussian pulses.

ENVELOPE WINDS AS A LIMITING FACTOR ON SUPERMASSIVE BLACK HOLE FORMATION IN QUASI-STARS

Presenter(s): Campbell, Claire, Undergraduate, Physics

Mentor: Prof. Matt Caplan

Authorship: Claire Campbell, Andy Santarelli

Present-day supermassive black holes (SMBHs) have no known formation mechanism that explains their mass and abundance. Typical stellar core collapse is limited, and subsequent accretion onto even the largest of collapsed stars is not sufficient to form an SMBH within a Hubble time. An alternative method of SMBH formation is direct collapse, wherein a disk of pre-galactic gas rapidly infalls to its center. Direct collapse occurs in a quasi-star, a theoretical star-like gaseous envelope supported by BH accretion rather than nuclear reactions. In this work, we have created numerical models of these quasi stars using the stellar evolution code MESA. We use these models to test the effects of envelope winds on SMBH formation. We find that winds place realistic constraints on the SMBH seeds that may result from quasi-stars.

DIAGRAM GENERATION FOR SPINOR AMPLITUDE SUBROUTINES

Presenter(s): Gabriel, Minney, Undergraduate, Physics

Mentor: Prof. Neil Christensen

Authorship: Minney Gabriel, Neil Christensen

Fundamental particles are the building blocks of the physical world. Physicists have studied the interactions between fundamental particles using experiments such as those conducted at the Large Hadron Collider (LHC) and by using Feynman Diagrams alongside numerical techniques to predict the outcomes of these experiments. However, Feynman Diagrams introduce unphysical degrees of freedom into calculations, an aspect that greatly hinders the efficiency of numerical calculations of scattering amplitudes. Using constructive diagrams instead of Feynman diagrams offers the prospect of removing these unphysical degrees of freedom, which could greatly increase the scope of scattering amplitude numerical calculations. The algorithmic generation and preparation of expressions for numerical calculations using constructive diagrams poses many unique problems, such as the recursive generation of interaction topologies and the algebraic manipulation of expressions to remove singularities. Raptor is a program-in-development that aims to solve these problems.

ANALYSIS OF MINIMA IN THE COMPLEX PARAMETER SPACE LANDSCAPE OF NEURAL NETWORKS

Presenter(s): Hardaway, Alexander, Undergraduate, Physics

Mentor: Prof. R. Grobe

Co-Mentor: Prof. Q. Su

Minimizing the loss function in a high-dimensional search space is a fundamental challenge in neural network applications. The parameter space in these models is often large, resulting in multiple minima that correspond to similar loss function values. This non-uniqueness issue becomes especially problematic when the neural network has more neurons than necessary. In this presentation, we will examine the phenomenon of "minimum hopping," which arises from overparameterization, and demonstrate how different convergence paths emerge through machine learning techniques applied to simple function matching with binary sigmoid activation functions. We will also characterize various types of minima, analyze the probability of converging to each, and evaluate the efficiency of convergence. We acknowledge NSF support.

INHERITED LEARNING IN NEURAL NETWORKS AND ITS APPLICATION TO QFT VACUUM STATES

Presenter(s): James, Eyan, Undergraduate, Physics

Mentor: Prof. R. Grobe

Co-Mentor: Prof. Q. Su

The phenomenon of supercritical field-induced vacuum breakdown has attracted growing interest, driven by advances in high-power laser technologies. In quantum field theory, the vacuum is often described by the occupied Dirac Sea states, which form the foundation for theoretical calculations. Accurately determining these states in a fast and efficient manner is highly sought after. Traditionally, this involves diagonalizing the Hamiltonian, a process that becomes increasingly complex when dealing with the Dirac Sea. In this study, we introduce a novel approach using neural networks to determine these states. Moreover, by applying the concept of the so-called inherited learning, we capitalize on the similarities between neighboring states, allowing us to recover many Dirac states with greater efficiency. We acknowledge NSF support.

QUASI-STAR MESA MODELS – REFINING BOUNDARY CONDITIONS, IMPLEMENTING ENVELOPE ACCRETION

Presenter(s): Nichols, Lane, Undergraduate, Physics

Mentor: Prof. Matt Caplan

Quasi-stars are a promising supermassive blackhole progenitor as an extension of direct collapse. We have created new models of these exotic stars, using MESA, where we implement new envelope accretion schemes and boundary conditions. These modifications allow us to understand the range of black hole seed masses that may form under stable quasi-star conditions. In addition, new boundary conditions allow us to both have a more accurate calculation of these masses and to further understand the internal structure of these stars.

USING MACHINE LEARNING TECHNIQUES TO PREDICT MOLECULAR COLLISION CROSS SECTIONS

Presenter(s): Parker, Helen, Undergraduate, Physics

Mentor: Dr. Allison Harris

Molecular collision cross sections are needed in many fields, such as plasma physics, astrophysics, biophysics, and chemical physics. Currently, the primary methods to determine these cross sections are experimental measurements or theoretical models, both of which have challenges. Measuring experimental cross sections is time consuming and expensive and must be done separately for each molecule of interest. Theoretical methods to calculate cross sections are time consuming and come with significant theoretical hurdles due to the complexity of the molecules' nuclear and electronic structure. These challenges have resulted in limited availability of molecular cross sections, which in turn inhibits the accuracy of applied physics models.

We have developed machine learning techniques to help fill the gap in available cross section data. To date, we have developed and applied a simple artificial neural network with a single hidden layer, which takes inputs of the number of different atoms in the molecule and outputs the electron-impact ionization cross section for different projectile energies[1]. The model was trained using published experimental data for a handful of molecular targets and showed the ability to predict cross sections to within 30% of known values.

In this work, we aim to improve on our existing model by modifying the network to include two physical parameters on which the ionization cross sections are known to depend - the ionization potential and electric dipole polarizability. These modifications are made by either including the physical parameters as inputs to the network in order to provide additional identifying information of the molecule or by including them as outputs of the network to serve as constraints on the network's predictions. Preliminary data shows that there is limited, if any, improvement in the predictions for the cross sections using the updated networks, but the predictions remained in reasonable agreement with published experimental results. Further improvements to our model are planned, such as including molecular structure information as an input to the network.

1. Harris, A. L. & Nepomuceno, J. A data-driven machine learning approach for electron-molecule ionization cross sections. *J. Phys. B: At. Mol. Opt. Phys.* **57**, 025201 (2024).

NEW 1D MODELS OF QAUSI-STARS

Presenter(s): Santarelli, Andy, Graduate, Physics

Mentor: Prof. Matt Caplan

Authorship: Andy Santarelli, Lane Nichols, Claire Campbell

Supermassive black hole formation remains as an unsolved problem. Quasi-stars represent a newer but still viable channel that have been explored more in depth in recent years. In this work, we have created new numerical models using the 1D stellar evolution code, MESA, in order to further understand their structure and stability. We use our models to further explore winds, envelope accretion, and additional boundary conditions.

SCULPTED LASER PULSES ALTER THE ELECTRON DYNAMICS IN ABOVE THRESHOLD IONIZATION

Presenter(s): Sims, Samantha, Undergraduate, Physics

Mentor: Dr. Allison Harris

The development of attosecond laser pulses has allowed for the ability to probe the dynamics of electrons in atoms on their natural time scales. One important process in attosecond science is above threshold ionization (ATI), in which an atom absorbs more photons than are required for ionization. The excess absorbed energy is converted to the kinetic energy of the ionized electron and the corresponding ATI spectrum has proven to be a valuable tool in many applications. Traditionally, sine-squared and Gaussian laser pulses are used when studying ATI. Sculpted laser pulses, however, have unique advantages over traditional laser pulse shapes. In particular, sculpted pulses can have more complicated envelope functions with multiple peaks, carry quantized orbital angular momentum, or exhibit self-acceleration, self-healing, and limited diffraction. These unique features allow for the possibility of enhanced control over electron dynamics and may alter the energy and momentum of the ionized electron. We calculate photoelectron energy and momentum spectra for ATI of hydrogen using Gaussian and Airy laser pulses with identical power spectra, but differing spectral phases. We solve the 3D time-dependent Schrödinger equation using the well-established solver QPROP. Our results demonstrate that the third order spectral phase of the Airy pulse can extend the rescattered electron plateau cutoff without increasing pulse duration or intensity. This feature may lead to new opportunities to study higher order effects in laser-atom interactions or offer greater control over ionization dynamics.

MOLECULAR DYNAMICS SIMULATIONS OF THE VORTEX-LATTICE INTERACTION IN NEUTRON STAR CRUSTS

Presenter(s): Smith, Nevin, Undergraduate, Physics

Mentor: Prof. Matt Caplan

Superfluid neutrons in the inner crust of neutron stars (NS) form quantized vortices that carry the angular momentum of the superfluid. These vortices are pinned in low-energy regions of the rigid ion lattice of the crust. During the spin down of NS, glitches have been observed where these stars temporarily increase their angular momentum in discrete intervals. During this period, the trapped vortices cause the angular speed of the inner crust to lag that of the outer crust. The vortices experience tension and stress causing unpinning and re-pinning; although the physics of this phenomenon is not well studied. We develop an empirical model to study a Gaussian well moving through an ion lattice using MD simulations. Confirming our predictions, we observe a “slip” point in the lattice deformation, such that the initial lattice reforms. We claim variations in the energy, timescale, and timestep of the system lead to complex frustration in our results.

ISOLATING DIFFUSION COEFFICIENTS OF LATTICE DEFECTS IN COULOMB CRYSTALS

Presenter(s): Webb, Levi, Graduate, Physics

Mentor: Prof. Matt Caplan

Authorship: Levi Webb, Dany Yaacoub

The diffusion coefficients of Coulomb crystals, as applicable to stellar astrophysics, have seldom been studied to a satisfactory level. Molecular dynamics (MD) studies such as this inform our understanding of the macroscopic properties of stellar remnants, such as white dwarfs and neutron stars. We use the MD code LAMMPS to simulate small Coulomb crystal lattices of varying temperature and screening length, then introduce defects by either inserting (interstitials) or removing (vacancies) particles. By tracking the propagation of these defects and their interactions with the surrounding lattice, we determine their diffusion coefficients. This research enhances current understandings of defect-driven diffusion in strongly coupled plasmas, thereby influencing knowledge of the thermal and mechanical evolution of the dense matter within white dwarfs and neutron star crusts.

USING NEURAL NETWORKS TO SOLVE ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS

Presenter(s): West, Carter, Undergraduate, Physics

Mentor: Prof. R. Grobe

Co-Mentor: Prof. Q. Su

Conventional approaches to solving ordinary differential equations (ODEs) and partial differential equations (PDEs) are often constrained by issues of spatial resolution and computational time, especially as dimensionality grows. However, neural network algorithms offer a promising solution to these challenges. In this presentation, we explore how these advanced techniques can be leveraged to efficiently solve both basic ODEs and PDEs in physics, overcoming traditional limitations. We acknowledge NSF support.

UNIVERSAL DIFFUSION IN COULOMB CRYSTALS

Presenter(s): Yaacoub, Dany, Graduate, Physics

Mentor: Prof. Matt Caplan

Diffusion coefficients for crystallized Coulomb plasmas are essential microphysics input for modeling white dwarf cores and neutron star crusts. Solving for diffusion coefficients require running large molecular dynamic simulations with thousands of particles over millions of timesteps. The diffusion in a crystallized plasma has been largely ignored and is often taken to be zero in stellar evolution simulations. We find that not only is this incorrect, but we find that the diffusion in a crystallized plasma can be modeled completely using a universal scaling law independent of screening. Our simulations also show that the dominant mode of diffusion in a Coulomb crystal is through the formations of defects in the lattice created due to thermal fluctuations.

SOCIOLOGY/ANTHROPOLOGY

NITE OUT!

Presenter(s): Cummings, Tanaya, Undergraduate, Accounting

Mentor: Dr. Livia Stone

Authorship: Tanaya Cummings

The nightlife of college students marks the beginning highlights of their young adulthood. Where they choose to mingle under the dim lights are formative of their night out experiences. This aims to showcase the juxtapositions between two ‘nite out’ cultures: classic bar goers and alternative house show scene.

MOTIVATIONS

Presenter(s): El Houmaidi, Ghali, Undergraduate, Sociology/Anthropology

Mentor: Dr. Livia Stone

Interview series of dedicated Illinois state University (ISU) students ranging from the fine arts to sports pertaining to the underlying motivations behind their work. This work has been elaborated as part of ANT-385 at ISU with the help of Professor Livia Stone.

RIOT -- 2024

Presenter(s): Johnson, Apollo, Graduate, Sociology/Anthropology

Mentor: Dr. Livia Stone

An ethnographic view of a counterculture music festival, from an attendee's point of view. Filmed and edited by Apollo Johnson.

RABBIT HOLES WITH ALEX: THE FACE OF GOD

Presenter(s): Koch, Alexander, Graduate, Sociology/Anthropology

Mentor: Dr. Livia Stone

Authorship: Alexander Koch

What do you imagine when you picture the face of God? A bearded man? An ephemeral light? Or something else entirely? In this video essay using filming and editing techniques learned from ANT 385/496 (Visual Anthropology) I host a personalized discussion of the Christian “Face of God.” Ranging from my own opinions to tracing historical iconography, the film encourages watchers to engage with the idea of face of God.

REVOLUTION IN THE WIND: THE REBIRTH OF BANGLADESH

Presenter(s): Rahat, Mustafizur, Graduate, Sociology/Anthropology

Mentor: Dr. Livia Stone

This documentary is a personal story about the 2024 July Revolution in Bangladesh. It combines my own experiences with the perspectives of Bangladeshis living abroad. The goal is to show the emotions and intensity of the movement while connecting what happened in Bangladesh to the experiences of the Bangladeshi community at Illinois State University (ISU). The film follows a personal essay style, with my voice guiding the audience through important events and themes. It is both informative and reflective, sharing my journey in a way that helps others understand the movement on a deeper level.

TRANSFERS IN TRANSITION: COMMUNITY COLLEGE STUDENTS IN THEIR FIRST SEMESTER AT A 4-YEAR

Presenter(s): Reft, Eleanor, Undergraduate, Sociology/Anthropology

Mentor: Dr. Livia Stone

Authorship: Eleanor Reft

This is an ethnographic interview-based film, done for a college anthropology class, about transfer students from various community colleges in their first semester at a 4-year institution. Since transferring to a 4- year institution myself, I had been experiencing some difficulties in adjusting socially. When faced with a film assignment for my media and visual anthropology class, I wondered if I could turn that difficulty into a research question. Realizing that I could shed some light on the experiences of transfer students, I reached out to friends and new acquaintances to see if they would be interested in being interviewed. Inspired by Jean Rouch and Edgar Morin's "Chronicle of a Summer" (1961) and Xun Sero's "Mamá" (2022), I hoped to make this film feel intimate and personal in its approach to ethnographic research. I believe the result is an honest, candid film about the shared ups, downs, and hopes of college transfer students

REDEFINING THEATRICAL PRACTICES FROM COLOMBIA'S INDIGENOUS

Presenter(s): Alexander, Michelle, Undergraduate, Theatre, Dance, and Film

Mentor: Dr. Le'Mil L. Eiland

Authorship: Michelle Alexander

La Yonna, a traditional dance of the Wayuu, and *La danza Jepa*, a dance adaptation of the traditional healing movement of the Emberá-Chami, are both Columbian dance practices built upon ancestral indigenous customs that are performative in nature. While these dances can be seen today at native dance conventions and competitions in Colombia, they are history and culture preserved. These matrilineal tribes demonstrate different ways that culture survives under oppressive structures and further expose the falsehood behind the claim that "Spain brought theatre to South America". These two distinct dances from Colombia present the power behind femininity in their cultures. Practices common to indigenous populations pre-colonization seldom utilized the word "theatre" to define them, however, does that mean they are not theatre? The theatre zeitgeist often leaves dance or "ritualistic" performances out of its definition despite the rich history of their conceptual integration. By including their practices as part of the "theatre canon", we further debunk the assertion that femininity is a "weak" or "demeaning" trait, as has been previously pushed by feminine stereotypes in theatrical spaces (i.e. the ingenue, the damsel in distress, the blonde, etc.). For these dances to best dispel the misconceptions that theatre was brought to South America by the Spanish, we must first review and revise the definition of 'theatre'. This research seeks to highlight the importance of indigenous and gender studies as it pertains to theatre with the goal of encouraging cultural compassion and diversifying the canon.

EVALUATING APPLIED THEATRE INTERVENTIONS: A CASE STUDY OF THE ASUBOA PROJECT

Presenter(s): Igwe, Fredrick, Graduate, Theatre, Dance, and Film
Mentor: Dr. Derek Munson
Authorship: Fredrick Igwe

The efficacy of applied theatre remains a subject of debate, with some arguing that it fails to bring about meaningful change, while others, drawing on Augusto Boal's philosophies, view it as a powerful tool for transformation. A key issue fueling this debate is the challenge of evaluating impact, as no universal method exists to measure outcomes. My research highlights the necessity of context-specific metrics to assess applied theatre's effectiveness. I developed an evaluation framework for the Asuboa Project, one of my earliest applied theatre experiences in Africa that measures short- and long-term impacts at both community and individual levels. Using the Asuboa Project as a case study, my research traces the development, practice, and influence of applied theatre and argues that meaningful assessment requires evaluation tools tailored to specific contexts.

DARK WATER: THE TRANSFERENCE OF TRAUMA BY OSMOSIS

Presenter(s): Lecouris, Jon, Undergraduate, Theatre, Dance and Film
Mentor: Prof. Li Zeng
Authorship: Jon Lecouris

In the film Dark Water (Hideo Nakata, 2002), a recently separated woman and her daughter are haunted by visions of a ghostly little girl. The mystery and tragedy surrounding the spirit literally seeps into the apartment inhabited by the mother and daughter in the form of water leaking through their ceiling and coursing through the apartment building's pipes. As Yoshimi attempts to build a happy home for herself and her child, she quickly finds that they have moved into a haunted house, a "sinister double of the perfect domestic space [women are] supposed to aspire to" (Le Fouillé). As the film unfolds, events occur that force the audience to question Yoshimi's sanity and the reality of the ghostly happenings. As we learn more about Yoshimi's own tragic childhood and history of mental illness, viewers must "question the reliability of their narrator, and, through the possibility of madness, encapsulate the trauma manifesting itself physically in the domestic space" (Le Fouillé). If the viewer reads the apartment building itself as a metaphor for the body of the mother, the dark water of the title as the medium through which trauma seeps into Yoshimi's life, and the ghostly girl as the physical manifestation of Yoshimi's unaddressed subconscious suffering, then one can unlock the secrets of what is much more than a simple haunted house tale.

PERFORMING THE AESTHETIC-SELF/IDENTITY IN "MANODZI" MUSIC VIDEO

Presenter(s): Quashigah, Lawrence, Graduate, Theatre, Dance and Film
Mentor: Dr. Derek Munson
Co-Mentor: Dr. Bruce Burningham
Authorship: Lawrence Quashigah

This paper joins the conversation on identity construction and performance but with a focus on aesthetics as a means of expressing and performing identity. A particular focus for that matter is on a selected Ghanaian music video, "Manodzi" by Ghanaian Artist, Stonebwoy featuring Beninese-French Singer, Angelique Kidjo. Extant literature on this topic has shown that identity is performed through actions for a specific audience. Also, the essence of identity is debated among scholars to include concepts such as, importance, salience, social construction, ethnicity, religion, culture and mutual construction. There has been minimal research on how the aesthetic self/identity is portrayed in Ghanaian music videos. Nonetheless, the paper shows that the concept of aesthetics is viewed by scholars from the points of personal values, cultural backgrounds, self-perception and pursuit of beauty, art and craft, rhythm and design and as abstract ideas. The aesthetic self is performed through concepts like aesthetic preference, taste and practice in performing the self- identity. Using the theories of aesthetics and semiotics, the paper examines how Stonebwoy and Angelique Kidjo perform levels of aesthetic identities in the "Manodzi" music video. The study concludes that Ghanaian and African arts were used symbolically to depict aesthetic identity by Stonebwoy, Angelique Kidjo and other performers in the music video.

E-Poster Session Abstracts

AGRICULTURE

THE IMPORTANCE AND RELEVANCE OF FARM SUCCESSION PLANNING

Presenter(s): Smith, Emma, Undergraduate, Agriculture

Mentor: Dr. Maria Boerngen

Despite what many may think, approximately 97% of the farms and ranches within the United States are family farms. It has been identified that the number one goal of most farms is survival, which includes being passed on to the next generation of producers. Planning and preparing for the succession of the operation from one generation to the next can be incredibly difficult, which is why farm transition planning is vital. According to the 2022 USDA Census, just under 53% of U.S. farms are involved in succession planning, which suggests that more farm families need to be prepared for the trials and tribulations this process will bring. It is crucial that families prepare ahead of time and fully communicate their thoughts, desires, and goals. One of the most common challenges families face while going through this process is relying too heavily on external professionals such as accountants, lawyers, and succession coaches. In addition to overreliance on outside entities, greed, entitlement, lack of communication, financial strains, and legal obstacles are just a few of the common issues that farm families face during this planning process. To address these issues, several agricultural advocacy organizations have come up with suggestions that may help steer transition planning in a positive direction. Communicating thoroughly and clearly, establishing a timeline, assigning roles, and addressing sensitive or difficult topics are just a few of the many expert- recommended strategies. To gain first-hand knowledge and insight on farm succession planning, I will be interviewing farmers and ranchers who have successfully completed this transition. By capturing the experiences of these producers, I can assist other farm families in learning from those who have gone before them, thus creating a more informed and seamless transition for their family operations.

CRIMINAL JUSTICE SCIENCES

GEOGRAPHIC ORIGINS AND PERCEPTIONS OF LAW ENFORCEMENT

Presenter(s): Carr, Ron, Graduate, Criminal Justice Sciences

Mentor: Dr. Jessie Krienert

Authorship: Ron Carr

This study examines how geographic origins influence the perceptions that Illinois State University students have of law enforcement. This study is grounded in Social Identity Theory and Procedural Justice theory and explores variations in how students from urban, suburban, and rural hometowns differ in their perceptions of law enforcement. Also, the role of media in shaping students' perceptions is explored. Survey data collected from a sample of 150 students was used to identify variation in attitudes toward law enforcement. Findings revealed that students from urban areas tended to have more negative views while students from rural areas had more positive views. These findings point out the importance of fair treatment and transparency in ensuring trust between police and the communities they serve. By understanding how geographic background shapes perceptions, this study provides useful insight into improving community-police relationships as well as promoting fairness in policing practices.

COMMUNICATION

THE IMPACT OF INTRODUCTORY PUBLIC SPEAKING COURSES ON STUDENT RETENTION IN HIGHER EDUCATION

Presenter(s): Murray, Taylor, Graduate, Communication

Mentor: Dr. Cheri Simonds

Co-Mentor: Dr. Stephen Hunt

This study examines how Reddit users discuss how their family communication patterns, and relationship closeness was affected by political discourse surrounding the 2024 election with their assumed close family members. Using a thematic analysis to look at a Reddit thread three major themes were found: conflict escalation and relationship strain, perceived betrayal and value misalignment, and avoidance as a communication strategy. Findings revealed that political disagreements frequently led to heightened arguments, emotional exhaustion, and sometimes estrangement within families. Many individuals expressed using avoidance to preserve emotional well-being, challenging established communication patterns and harming relationship closeness. Taking a closer look at this topic provides insight into navigating family relationships in a time of high political polarization.

CREATIVE TECHNOLOGIES

THE GAME JAM GAME: “DICK-TIONARY: THE INSULT INDEX”

Presenter(s): Bauer, Trinity, Graduate, Creative Technologies

Mentor: Dr. Kristin Carlson

For the 2024 Game Jam, we were challenged to make a game within three days. My group and I created “Dick-tionary: The Insult Index” as a fun game for friends or family to play together. There is nothing like insulting someone in a funny manner. You won’t even get in trouble for insulting them!

The goal of the game is to combine words to craft comedic insults for your opponents. Hurl insults and try to get the most points to win!

A CASE STUDY OF AI-ASSISTED TEACHER EVALUATION PREPARATION

Presenter(s): Beinborn, Jacob, Graduate, Creative Technologies

Mentor: Dr. Kristin Carlson

This case study examines the integration of Large Language Model (AI) Systems into teacher evaluation preparation. This study examines how AI can be leveraged as a tool for reflection and professional documentation. This case was conducted with Claude AI within a Danielson Framework evaluation and identified a methodology for enhancing and assisting educators in the preparation for their district evaluation processes. In this methodology, there are examinations of the ways these tools can support through methodical and tailored interview questions, framework alignment, artifact and evidence documentation, and professional reflection.

The strategies developed in this study seek to help improve the impact, accuracy, and efficiency of the evaluation process. This includes structuring prompting to target domain indicators and identification of supporting artifacts specific to a teachers individual context.

This study contributes to continuing examinations of the ways that AI tools can be applied to the education sector and its professional development processes.

THE COGNITIVE EFFECTS OF VIDEOGAMES IN KIDS AND ELDERS

Presenter(s): Higgins Aranda, Ellen, Graduate, Creative Technologies

Mentor: Dr. Kristin Carlson

Video games have been a prominent part of culture for the past 30 years, in this time they have been subject to much social commentary, some of it positive but a good chunk of it being negative. Many of their side effects are not fully known but there is evidence that suggests that video games can have a positive result in people suffering from dementia and in how kids' reflexes develop…

FRAGILE WATERS: PROJECTING LIFE BELOW

Presenter(s): Holtz, Lindsey, Graduate, Creative Technologies

Mentor: Dr. Kristin Carlson

Authorship: Lindsey Holtz

Our oceans are very fragile ecosystems that when damaged, can have catastrophic effects to the life that lives there. The goal of my work is to bring research about our world's oceans to a wider audience using glass, projection mapping, and interactive elements. By examining the specific ways in which human activities disrupt oceanic systems, an effective art installation can be developed to better educate and inform others. Firstly, the medium of glass will be used to represent different sea life animals including sea turtles, jellyfish, and schools of fish. Glass as a medium is a direct metaphor to represent how fragile this sea life is, and will be the canvas for projection mapping. Additionally, with any art installation an emotional aspect can be reached. This will be accomplished by involving interactivity. As viewers get closer to these glass works, the colors will fade from the projections. As they move further away, the color will come back. This will make the viewer have an emotional connection to the topic by seeing the correlation of their presence on the changes to the environment. Throughout the entirety of the installation space, research about the specific animals represented will be given along with ways that they are effected, and what the viewers can do to help. The exhibition of this showcases a colorful glass coral reef with fish encased in a round tank full of water. As viewers enter the space, a drop of oil will be dropped into the tank to represent the human caused long-term consequences for marine life. This will give the viewers a visual example of how negatively humans affect these fragile ecosystems, and how sometimes the damage cannot be undone. By using glass, projection mapping, and interactive elements with the guidance of research to create an art installation, the knowledge about our fragile oceans can be wider spread, and result in the saving of one of the Earth's most valuable assets.

HOW MUST THE SHOW GO ON? ADVANCEMENT OF TECHNOLOGY AND ITS EFFECTS ON THE LIVE PERFORMANCE EXPERIENCE

Presenter(s): Murray, Anthony, Graduate, Creative Technologies

Mentor: Dr. Kristin Carlson

The advancement of technology has had tremendous effects on live performances for both the audience and the performers. Cellphones, cameras, live streaming, and social media have dramatically changed live performances forever. Most will understand the audience point of view but haven't had the opportunity to have firsthand experience as the performer. I am exploring how live performances have changed or not depending on how technology is allowed in the venue.

ENHANCING REAL-TIME FRAUD DETECTION IN UTILITIES: THE ROLE OF AI AND PREDICTIVE MAINTENANCE ANALYTICS

Presenter(s): Rajput, Shahab Anas, Graduate, Creative Technologies

Mentor: Dr. Kristin Carlson

The integration of Artificial Intelligence (AI) and Predictive Maintenance Analytics (PMA) is transforming fraud detection within the utility sector. Traditional methods of identifying fraudulent activities, such as meter tampering, unauthorized consumption, and billing anomalies, often rely on reactive approaches, leading to revenue losses and operational inefficiencies. This research explores how AI-driven fraud detection systems, combined with predictive maintenance techniques, can proactively identify and mitigate fraudulent activities in real time.

Through machine learning algorithms, AI can analyze vast datasets from smart meters, customer usage patterns, and historical fraud cases to detect anomalies indicative of fraudulent behavior. Predictive Maintenance Analytics further enhances fraud detection by identifying irregularities in energy distribution networks before they escalate into significant losses. By leveraging predictive modeling, utilities can preemptively flag high-risk accounts and deploy targeted inspections, thereby improving accuracy and reducing false positives.

AUDITORY UNCANNY VALLEY: COGNITIVE NARRATOLOGY IN HORROR AUDIO DESIGN

Presenter(s): Seelinger, Katharine, Graduate, Creative Technologies

Mentor: Prof. Kristin Carlson

This research explores how to create auditory cognitive dissonance within the context of interactive horror narratives. The evidence relates to the emotional output of audio design within horror video games and explores how to implement audio design techniques to heighten emotional responses within players. Findings from randomized, controlled trials suggest that trends in horror are influenced by the audience consuming it, supporting academic research from cognitive narratology. The importance of audio used in horror-related media have a direct impact on the consumer and change the experience pulled from the media. From these trends, we can use auditory illusions to weaponize cognitive dissonance within horror video game players.

IMPACT OF AGE, GENDER, TECHNOLOGY KNOWLEDGE, TEACHER PREPAREDNESS, AND ICT SKILLS ON THE USE OF TECHNOLOGY IN MATHEMATICS INSTRUCTION

Presenter(s): Bounouader, Mouna, Graduate, Educational Administration and Foundations

Agyei, Emmanuel, Graduate, Mathematics Education

Jegede, Kehinde, Graduate, Mathematics Education

Mentor: Dr. John K. Rugutt

The study used regression to assess the relationship between the use of technology in mathematics instruction and age, gender, technology knowledge, teacher preparedness, and ICT skills. Regression results indicated that the overall model was statistically significant in predicting the use of technology in mathematics instruction by high school teachers, $F (5, 196) = 25.1$, $R2 = .39$, $R2adj = .38$, $p < .001$. This model explains 39% of the variance in high school teachers' use of technology in mathematics instruction. The regression coefficients indicated that age, ICT skills, and teacher preparedness significantly contributed to the model. The prediction model for using technology in mathematics instruction is as follows: Use of technology = 9.88 + 0.5 Teacher Preparedness + 0.15 ICT Skills – 1.54 Age. The standardized coefficients showed teacher preparedness to be the most influential predictor followed by ICT skills. The study concluded with a discussion of the importance of the study variables.

ENGLISH

GENERATIONAL TRAUMA AND HEALING: LATINX/E YOUTH LITERATURE AND MEDIA AS TOOLS FOR MENTAL HEALTH ADVOCACY

Presenter(s): Cintron Gonzalez, Edcel, Graduate, English

Mentors: Dr. Roberta Trites

My doctoral research examines the intersection of Latinx/e youth literature, media, and mental health, emphasizing the need for transparency and visibility in children's media. Drawing from Meghann Meeusen's Children's Books on the Big Screen (2020), I argue for the importance of diverse cultural representation that affirms Latinx/e identities and promotes mental health awareness. Using Disney's Encanto (2021) as a key example, the presentation explores how themes of generational trauma, anxiety, and family healing resonate with Latinx/e audiences, fostering important conversations around traditionally silenced issues in Latinx/e communities. Furthermore, Encanto offers conversations for Latinx/e families to create safe spaces for discussing mental health. This film also highlights themes of migration, displacement, and the redefinition of home, while positioning Latinx/e youth protagonists as agents of healing and change. Grounded in Gloria Anzaldúa's framework of storytelling as transformative resistance and Jiménez García's metaphor of "side by side," I explore how these narratives foster solidarity and amplify underrepresented voices.

By challenging aetonormative perspectives that prioritize adult experiences, these works center youth as both recipients and agents of mental health support, offering tools for navigating trauma and building resilience. Additionally, I examine current disparities in mental health care access for Latinx/e communities, advocating for equitable and culturally sensitive resources that reflect the lived experiences of Latinx/e families. Through a blend of personal narrative and literary analysis, referencing Latinx/e authors such as Andrea Beatriz Arango and Alexis Castellanos, this presentation underscores the potential of Latinx/e youth literature and media to bridge gaps in mental health discourse. By sharing stories of struggle, identity, and healing, these texts provide transformative opportunities for readers to engage with and address mental health within the Latinx/e community.

ONCE UPON A CLASS: STORYSHARE AS A FRAMING METHOD

Presenter(s): Mizan, Ridita, Graduate, English

Mentor: Prof. Angela Haas

When I taught a new course last semester, I struggled with a familiar challenge: how do we cultivate mutual trust and respect in the classroom without forcing students into pre-scripted learning outcomes? Standardized rubrics, assessment models, and pedagogical norms often assume that learning is measurable, linear, and predefined. However, my experience in this class reinforced a different reality: true learning happens beyond formal outcomes; it emerges organically from the interactions between students, the texts, and the shared classroom space. One of the most impactful ways this unfolded was through storyshare, a practice that reshaped not only how my students engaged with course material but also how I, as an instructor, rethought my role in facilitating learning. In this presentation, I explore the role of storyshare as a framing method that fosters mutual trust, accessibility, and emergent learning. I contrast storyshare with traditional storytelling, arguing that while storytelling often conveys a clear message or moral, storyshare allows for the open exchange of perspectives, inviting students to interpret, connect, and take meaning in their own way. This distinction has profound implications for how we understand learning itself. Through this presentation I hope to share how in my course storyshare enabled students to engage deeply without the pressure of predetermined outcomes, allowing them to experience learning as a collective, relational process rather than an individual task to be completed.

THE BREWING STORM OF ADOLESCENCE: HURRICANE AS METAPHOR IN ASHA BROMFIELD'S HURRICANE SUMMER

Presenter(s): O'Leary, Heather, Graduate, English

Mentor: Dr. Chris Breu

For those living in Jamaica, hurricanes are a part of life - something dreaded but expected, a part of the culture, the story of that place. But hurricanes can also pose an existential threat, with the ability to wipe out towns, wash away lives, and change everything forever. In Asha Bromfield's coming-of-age novel, Hurricane Summer, the teenage protagonist, Tilla puts it this way: "when a hurricane passes through, it knows no favor. It takes no precedence. When the time is right and it is ready, it will destroy you. It will destroy everything. Even the good things. Even the things you love" (345). In a metaphorical sense, the trials of childhood and adolescence can come storming through a teenager's life, changing everything they thought they knew about the world. Bromfield follows Tilla's experience through a very real storm, while also addressing the trauma Tilla goes through in other aspects of her life.

DRY NEEDLING USE IN PAIN MANAGEMENT FOR TENSION HEADACHES AND MIGRAINES: A CRITICALLY APPRAISED TOPIC

Presenter(s): Faulhaber, Kiara, Graduate, Kinesiology and Recreation

Mentor: Dr. Chelsea Kuehner-Boyer

Clinical Scenario: Tension headaches or migraines can severely deplete a patient's quality of life, and can often be difficult to treat, requiring the use of interventions with negative secondary effects. Dry needling is a therapeutic modality that has risen in popularity among clinicians and healthcare professionals in recent years. Dry needling is performed by highly qualified and certified clinicians and involves inserting medical grade needles into affected muscles to alleviate pain and tension. In recent years research examining the effects of dry needling in chronic musculoskeletal pain has been abundant, however, little research exists on the effectiveness of dry needling on other chronic pain pathologies including headaches. This critical appraisal sought to provide high-level clinical recommendations on the effectiveness of dry needling on migraine and tension headaches. **Focused Clinical Question:** In patients with tension and migraine headaches, what is the effect of dry needling on pain? **Search Strategy:** An electronic search was completed in the fall of 2023 of the Consortium of Academic Research Libraries I-Share Library system, which includes the databases of 89 libraries from colleges and universities throughout the state of Illinois. The search terms and Boolean phrases used were dry needling AND tension headaches. Article inclusion criteria included English language, articles published between 2018-2023, and randomized control trials. Articles were excluded if they were not peer-reviewed, if the study was not a randomized control trial, or if the dry needling was not used as an intervention. A total of 4 articles met the criteria for inclusion in this appraisal. **Evidence of Quality Assessment:** Articles were assessed using the Physiotherapy Evidence Database (PEDro Scale). **Clinical Bottom Line:** Dry needling was found to be effective in treating tension headache symptoms. It was also found to be a swift and economical option for treating chronically affected patients, although there was the expressed concern that it might not be an option for patients who have a fear of needles.

FROZEN SHOULDER IN FEMALE HIGH SCHOOL SOCCER PLAYER: A LEVEL 3 CASE STUDY

Presenter(s): Kunz, Marissa, Graduate, Kinesiology and Recreation

Mentor: Dr. Hayley Ericksen

Authorship: Chelsea Kuehner-Boyer, Justin Stanek

Background: Adhesive capsulitis (frozen shoulder) happens when there is a gradual loss of AROM and PROM in the glenohumeral joint, occurs in 2-5% of the general population, and is rare in young, active individuals. Adhesive capsulitis occurs most often in females 40-60 years old. **Patient:** A 17-year-old female soccer player presented to the ATF self-splinting her arm against her body, complaining of shoulder pain. The patient reported falling on her shoulder during a game the night before and feeling a pop, as if her shoulder had shifted forward. She was initially diagnosed with a glenohumeral subluxation and was given a sling. Due to concern, the patient went to urgent care and her x-ray was normal. She wore a sling for two weeks and saw no improvement, so she went to an orthopedic specialist and her MRI came back normal. She wore the sling for a month and began physical therapy at a clinic, but her symptoms worsened, she lost most shoulder motion and the pain increased. Six weeks after the initial injury, she was diagnosed with adhesive capsulitis. **Treatment:** The orthopedic surgeon performed a manipulation under anesthesia, which improved the patient's range of motion (ROM). Eight weeks after the initial injury, the patient began rehabilitation focusing on ROM, shoulder strengthening, soft tissue mobilization, and cryotherapy. The patient attended all sessions and completed exercises 5 days per week for 2 months. After week 16, the patient saw major improvements and was ready to return to play. **Outcomes:** The QuickDASH measure was used to track the patient's function throughout rehabilitation. For the first 2 weeks of rehabilitation, the patient's function worsened. By week 6, there was significant functional improvement. Between weeks 2 and 8, pain reduced from 8/10 to 0/10. As the patient progressed through rehabilitation, her ability to complete daily activities such as showering and dressing improved. **Conclusions:** This was an atypical patient and presentation of adhesive capsulitis. An accurate diagnosis was delayed, which may have contributed to the extended rehabilitation. Once diagnosed, pain and ROM improved with rehabilitation and full RTP was achieved 16 weeks after the initial injury. Adhesive capsulitis is not a very common condition seen in young athletes due to their age and activity level. It's important to know and understand the signs and symptoms to make a proper diagnosis and not rule out a condition because the patient is atypical.

LANDING TECHNIQUES AND RISK FACTORS FOR ACL INJURY IN VOLLEYBALL: A CRITICALLY APPRAISED TOPIC

Presenter(s): Larson, Alivia, Graduate, Kinesiology and Recreation

Mentor: Dr. Hayley Ericksen

Authorship: Chelsea Kuehner-Boyer, Justin Stanek

Context: Non-contact anterior cruciate ligament (ACL) injuries are common in females participating in athletics. Volleyball's unpredictable movements of cutting, planting, single-leg landing (SLL) instead of double-leg landing (DLL), trunk position and mid-air twisting can increase risk of ACL injury. Clinical questions: which type of landing technique and/or trunk variation could place volleyball athletes at increased risk of ACL injury? **Methods:** The following keywords were used to search in November 2024: volleyball, landing, and ACL. Studies published between 2014-2024, in English, investigating kinematic and kinetic variables associated with ACL injury risk in jump-landings during a volleyball task were included. Studies were excluded if they studied populations over 17 years old, and did not include SLL, DLL, or trunk rotation during landings. The outcome variables of interest included: vertical ground reaction force and trunk, hip, knee and ankle biomechanics during a volleyball jump-landing task. Three total crossover studies (Zinger et al. (90%), Xu et al. (68%), Zahradnik et al. (86%)) were included and appraised with Strength of Reporting of Observational Studies in Epidemiology (STROBE). **Results:** Zinger, et al. found DLL to be a safer landing style compared to SLL because of the increase in hip and knee flexion and ankle plantarflexion in volleyball athletes. Xu, et al. found when volleyball athletes perform SLL they presented with smaller flexion angles of the knee and hip, increased joint moment, and increased vGRF. Zahradnik, et al. found the associated risk factors of non-contact ACL injury appeared to be related to the tilt of the arms and accompanying trunk tilt during blocking tasks. Trunk tilt led to decreased knee flexion, increased vGRF, and led the trunk towards the right lower limb. **Conclusion:** The studies included in this review found a landing technique that includes SLL, decreased ankle plantarflexion, knee and hip flexion angles, and a trunk tilt could place volleyball athletes at an increased risk of ACL injury. ATs should evaluate volleyball athletes' jump-landing to identify high-risk landing patterns and work with coaches in training athletes to DLL and swing block with proper form. ATs should work with strength and conditioning coaches to implement balance/stabilization exercises so that if a SLL is unavoidable, the risk of knee injury can be minimized. Regardless of the play, volleyball athletes should prioritize landing with a straight trunk and a higher knee flexion angle to minimize the risk of SLLs which in turn could increase the risk of ACL injury.

THE EFFECTS OF BLOOD FLOW RESTRICTION ON ATHLETES DURING REHABILITATION: A CRITICALLY APPRAISED TOPIC

Presenter(s): Lietz, Kaila, Graduate, Kinesiology and Recreation

Mentor: Dr. Chelsea Kuehner-Boyer

Authorship: Marissa Kunz, Kaila Lietz

Clinical Scenario: Blood flow restriction (BFR) was discovered in 1966 by Dr. Yoshiaki Sato. BFR uses a cuff to create a hypoxic environment in a limb, which is purported to mimic the effects of a high-intensity exercise without the same stress placed on the tissues. This Critically Appraised Topic (CAT) sought to identify and analyze the most clinically relevant published evidence on how BFR affects rehabilitation in athletes and to provide athletic trainers with a clear and comprehensive synthesis of the best available evidence and practice recommendations. **Focused Clinical Question**: Does blood flow restriction aid in the rehabilitation of athletes? **Search Strategy**: An electronic search was completed in the fall of2023 of the Consortium of Academic Research Libraries I-Share Library system, which includes the databases of 89 libraries from colleges and universities throughout the state of Illinois. The search terms and Boolean phrases used were “blood flow restriction” AND “rehabilitation” AND “athletes.” Article inclusion criteria included English language, articles published between 2018-2023, and an athletic population of interest. Articles were excluded if they were not peer-reviewed and if the study was not focused on blood flow restriction interventions. The initial search returned 73 studies, following review 6 articles were retained for inclusion in the critical appraisal. **Evidence Quality Assessment**: Studies were critically appraised using either the PEDro Scale, the JBI Checklist for Case Reports, or the JBI checklist for Text and Opinion Papers depending on the type of study being evaluated. **Results of Summary of Search**: All six articles included in this CAT agreed that BFR has a positive effect on the rehabilitation of athletes when paired with rehabilitative exercises. Five studies analyzed the effects of BFR on pain in patients during rehabilitation and found that BFR reduces pain throughout the rehabilitation process. Three studies analyzed the effect of BFR on muscle strength and hypotrophy following injury and agreed that the addition of BFR to a standard rehabilitation plan can improve strength and reduce hypertrophy following injury. **Clinical Bottom Line**: Studies showed that BFR is effective, but not when used in isolation. In order for BFR to be effective it must be used in conjunction with traditional rehabilitation. The studies found that when paired with rehabilitation BFR allows injured athletes to have the benefits of high-intensity exercise without the risk of using heavy loads and leads to increased strength, function, and hypertrophy.

NURSING

A GROUNDED THEORY OF PRIORITIZATION AMONG SCHOOL NURSES

Presenter(s): Calvillo, Melissa, Graduate, Nursing

Mentor: Dr. Susana Calderon

Authorship: Melissa Calvillo, Susana Calderon, Cherrill Stockmann, Sheryl Henry, Maureen Rabbitte

School nurses balance multiple competing demands to maintain or improve health and safety. While the School Nursing Practice Framework™ describes practice activities, it does not address how the nurse might prioritize activities to achieve desired outcomes. The purpose of this study was to create a theory of prioritization among school nurses in the United States. Twenty-nine Midwestern school nurses participated in one-hour semi-structured interviews. Grounded theory was used to create a theory of prioritization among school nurses. The central categories of prioritization are external requirements and expectations; consistent resources; autonomy; perceived high volume and acuity of work; being misunderstood; deadlines; presence; intrinsic motivation; the nursing process; experience over time; the processes of triage, adaptation, and advocacy; and efficacy. The desired outcome of effective prioritization is a safe and healthy school community.

PHYSICS

COMPUTATIONAL MODEL OF SPREADING DEPOLARIZATION IN LARVAL FRUIT FLY BRAINS

Presenter(s): Lamphere, Daniel, Graduate, Physics

Mentor: Dr. Allison Harris

Co-Mentor: Dr. Wolfgang Stein

Authorship: Daniel Lamphere, Wolfgang Stein, Allison Harris

Spreading Depolarization (SD) is a marked propagation of neuronal inactivity that spreads across large brain regions. This phenomenon is implicated in several neurological diseases including migraine, ischemia, traumatic brain injury, and stroke. However, presently, the exact cause of how SD is initiated is unknown.

SD is not only exhibited in humans but also in insects, such as the fruit fly *Drosophila melanogaster*. A simple method of inducing SD in fruit flies is by reducing their body temperature to the critical thermal minimum (CT_{min}). This temperature varies between different species of fruit flies but ranges from 10°C to -3°C in adult flies. Once a fly reaches its CT_{min}, the fly enters a chill coma state that has been correlated with SD events. Our group has recently shown that cold-induced SD events occur at all stages of the fruit fly life cycle, including its larval stages. Additionally, despite obvious physiological and structural differences in their nervous systems, the SD events within adults and larvae are characteristically similar.

One particularly striking difference between adult and larval flies is the number of neurons, with the first instar larvae having two orders of magnitude fewer than adults. Yet, both developmental stages show cold-induced SD, suggesting that SD is caused by common fundamental mechanisms. We aim to understand these mechanisms by developing a neuronal model of the first instar that accounts for all 3000 neurons present within the first instar. Such a model may help elucidate temperature induced SD events. This insight could be further extrapolated to other SD events induced by different phenomena.

We aim to develop this model using the Hodgkin-Huxley model as a basis. As we develop this model, we plan to focus on the explicit temperature dependence of ionic channels as well as the extracellular ion diffusion that is characteristic of SD. The results of this model will be used in conjunction with experimental data to better understand the role of neuronal excitability in inducing SD.

TRANSNATIONAL JUSTICE: THE FLUIDITY OF STRUGGLE WITHIN THE GLOBAL BLACK BLACK BODY

Presenter(s): Benson, Jazmine, Undergraduate, Politics and Government

Mentor: Dr. Noha Shawki

Authorship: Jazmine Benson

Black global inequality is a recurring and prevalent theme within the international community, stemming from the consequences of colonialist actions. Global transnational movements have the capability to create a spectrum of outcomes, from the spur of radical change, to socio political unrest. This research project focuses on the internationalism of Black transnational movements, specifically highlighting the Black Lives Matter (BLM) movement and its spread beyond borders. Considering the popularity of the BLM movement and the era that hosted its most prominent work, the influence and importance of COVID-19 in these transnational movements was not ignored. In conjunction with highlighting the clear inequities faced by Black individuals and individuals of color, COVID-19 increased the importance of social media and internet in the growth of transnational movements, as many individuals exposed themselves newly to the reality of racial disadvantage. In addition, the continued conversations about reparations on an international scale set the stage for potential opportunities for Black individuals disadvantaged by the class-based discrimination focused on race. This paper serves as commentary on the postcolonial themes of Black transnational movements, further highlighting the sustaining economic, health and racial injustice faced by Black individuals regardless of nationality or country of origin.

REDUCING SELF-STIGMA: THE CATALYZING INFLUENCE OF SELF-CONCEPT CLARITY?

Presenter(s): Adleman, Elise, Undergraduate, Psychology
Herrmann, Jake, Undergraduate, Psychology
Hintz, Ashley, Undergraduate, Psychology
Williams, Sarah, Undergraduate, Psychology
Sooby, Matthew, Graduate, Psychology

Mentor: Dr. Daniel Lannin

Authorship: Daniel Lannin, Elise Adleman, Jake Herrmann, Ashley Hintz, Sarah Williams, Matthew Sooby, Andrew Seidman

Greater self-concept clarity strengthened the negative association between self-stigma and self-empowerment processes—self-affirmation, self-compassion, and personal growth initiative. Interestingly, at lower levels of self-concept clarity, self-affirmation was associated with increased self-stigma. Interventions to reduce self-stigma should consider individual differences in self-concept clarity when applying self-empowerment strategies.

EXAMINATION OF MOOD CONGRUENT MUSIC LISTENING FOR SADNESS AND ANXIETY

Presenter(s): Budik, Emily, Graduate, Psychology

Dade, Quinton, Undergraduate, Psychology

Fournier, Ava, Undergraduate, Psychology

Dasovic-Walker, Anna, Undergraduate, Psychology

Mentor: Dr. Jeffrey Kahn

Authorship: Jeffrey H. Kahn, Emily P. Budik, Quinton Dade, Ava Fournier, and Anna Dasovic-Walker

Listening to sad music is a common regulation strategy for people experiencing sadness, perhaps because mood-congruent music helps with emotional recovery (Hunter et al., 2011; O'Malley et al., 2016). Would the mood-congruence effect extend to other unpleasant emotions such as anxiety? People experiencing depression may enjoy sad music because of its slow, relaxing qualities (Yoon et al., 2020); thus, when feeling anxious, people might prefer slow and predictable music to fast, discordant, and unpredictable music (which would seem to characterize anxiety). Our lab experiment tested this hypothesis. 117 college students have completed the study. Participants came individually to the lab. After consenting, participants answered surveys for demographics and baseline mood. Participants then listened to fifteen 30 s mood-inducing sound clips each with identical accompanying questionnaires that rated the participants' emotional experience, and whether they would want to listen to the clip while in a particular mood. The participants were then debriefed and dismissed. Based on 1,755 ratings of sound clips (N × 15) collected, correlations at the level of the sound clip (unadjusted for nesting within participant) indicate that when participants are feeling sad, they want to listen to audio that sounds sad, r = .58. There was no such correlation between participants feeling anxious and wanting to listen to audio that sounds anxious, r = –.14. Multilevel regressions that accounted for nesting of audio within participants indicated that, when one feels sad, they would be significantly more likely to listed to sad-sounding audio (b = 0.62) and less likely to listen to anxious-sounding audio (b = – 0.22); the same pattern was found for when one is feeling anxious (b = 0.28 for sad-sounding audio, b = –0.17 for anxious-sounding audio). This experimental study demonstrated that when people feel sad, they want to listen to sadder songs. However, songs that sound more anxious are less palatable for people when they are feeling anxious, suggesting that the mood-congruency effect does not extend from sadness to anxiety. Desire for relaxation might instead dictate the music choices among those feeling anxious (see Saarikallio, 2008). This poster will expand on these results and present implications for theory and practice.

SUPERVISORS' RESPONSES TO MICROAGGRESSIONS ENACTED TOWARDS GRADUATE STUDENTS OF COLOR

Presenter(s): Concepción Cabán, Lourdes, Graduate, Psychology

Goins, Rochelle, Graduate, Psychology

Osman, Farhia, Graduate, Psychology

Mentor: Dr. Brea Banks

Authorship: Lourdes D. Concepción Cabán, Rochelle E. Goins, Farhia A. Osman, Brea M. Banks, Tyra M. Jackson, Arielle N. Flint, Keeley Hynes, Kierra R. Peterson

Graduate clinicians holding marginalized identities have faced dismissal or invalidation from supervisors when disclosing microaggressions, however, there is no research examining supervisors' response to the disclosure in mental health service programs (Bautista-Biddle, et al., 2021). Thus, the current study used qualitative methods to learn about graduate trainees of color's experiences discussing these transgressions in supervision. Guided by a Critical Race Theory framework, the study also examined the experiences with racism that intersected with other identities (e.g., gender, sexuality, ability; Solórzano & Yosso, 2002).

We recruited 10 graduate students of color from mental health service fields (e.g., school, counseling, and clinical psychology). Participants engaged in 30-minute interviews with the research team, during which they discussed their experiences with disclosing microaggressions to supervisors in their program. Using thematic analysis, two members developed a codebook identifying the themes and systematically coded each interview according to the definitions and achieved an ICR of 100%.

Four major themes emerged from data analysis to explain participants' experiences with microaggressions and disclosing microaggressions: (a) emotional reactions, (b) types of microaggressions, (c) climate, and (d) behaviors. Two emergent themes explained the responses to participants' disclosure of microaggresive experiences: (a) institutional feedback, and (b) faculty responses.

The qualitative nature of the study allowed participants to share their own counterstories. As a large part of the study examined program climate and retention, the findings may inform the efforts university graduate programs, internship programs, and other trainers of mental health service provision students.

DIFFERENTIAL PREDICTION OF PERSONALITY IN HIGH-STAKES CONTEXTS

Presenter(s): Cannon, Kara, Graduate, Psychology

Mentor: Dr. Dan Ispas

Authorship: Kara Cannon, Alexandra Ilie, Dan Ispas, Drago Iliescu, Kevin Askew

We investigate the differential prediction of personality (big five) by age and gender using job performance data collected 1 year later. Data was collected from 1009 participants in a high-stakes context (as part of job applications). Our results show limited evidence of differential prediction.

EXAMINING THE EFFECTS OF WRITING TOOLS ON WRITTEN EXPRESSION PERFORMANCE

Presenter(s): Guo, Stephanie, Graduate, Psychology

Mentor: Dr. Gary Cates

Writing is a crucial skill for academic functioning. Despite the importance of utilizing effective writing instruction and intervention strategies to improve students' written expression, research on writing interventions for students in grades K – 12 is limited. The current study aimed to examine if students' writing performance improves as a factor of different writing tools used. Experimental analyses were conducted with two participants, one in 3rd grade and one in 5th grade, referred for writing concerns and reported physical discomfort when writing. The experimental analysis protocol consisted of seven conditions in which each participant was asked to type, draw, or use a specific tool to write a response to a story starter prompt from the AIMSweb academic progress monitoring system. Writing tools used were a #2 wooden pencil, a wooden pencil of increased size, a wooden pencil of increased size with a pencil grip made with rubber bands, a #2 wooden pencil with a soft pencil grip, and a ClearPoint mechanical pencil. Data was collected on the participants' number of Correct Writing Sequences (CWS) and corresponding percentile ranks provided by AIMSweb, self-reported hand discomfort using a 1 – 5 scale, and frequency of verbal and physical reports of hand discomfort. Results revealed that writing performance improved relative to baseline depending on tool used for one participant but not for the other participant. Self-reported hand discomfort varied across conditions for both participants. Taken together, the results indicated that using different writing tools may have an effect on writing performance and writing comfort, though these effects may differ between individuals.

FAMILY REFLECTIONS: MATERNAL IMPACT ON BODY IMAGE AND SIBLING CLOSENESS

Presenter(s): Kolze, Alannah, Undergraduate, Psychology

Mentor: Dr. Suejung Han

Purpose

Maternal influences on their children's body image through comments on weight and body shapes are well- established (Handford, Rapee, Fardouly, 2017), but the mechanisms through which such an influence occurs have not been sufficiently examined. Studies have shown that sibling relationships and attachment also impact a person's psychological outcomes (Dahill et al., 2023). I propose that mothers' behaviors— such as making comments about body shape, weight, or eating habits and pressuring children to achieve certain appearances—may negatively affect body esteem by increasing bodily comparison with siblings. Specifically, it is hypothesized that mothers' body- and eating-related comments are associated with adult children's body esteem negatively through bodily comparisons with siblings.

Procedure

Participants were 329 undergraduates (mean age = 19.83, SD = 6.34, 84% Whites, 87% female) recruited through the research participation management system of SONA for course credits. Participants completed an online survey that included modified items from the Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ) (Thompson et al., 2000), modified items from the Upward Physical Appearance Comparisons (UPACS) (O'Brien et al., 2009), and the Body-Esteem Scale for Adolescents and Adults (BESAA) (Mendelson, White, & Mendelson, 1997).

Results

A path analysis was conducted using SPSS PROCESS MACRO (Hayes, 2022), with maternal comments as the IV, body esteem as the DV, and bodily comparison with siblings as the mediator. The mediation model was supported, $R=.56$, $R^2=.31$, $F(2, 283) = 20.93$, $p<.001$. The paths were significant in the expected direction. The indirect effect was significant, $\beta = 0.0030$ [-.0055, -.0012]. The direct effect was also significant, $\beta = -.03$, $p<.001$, indicating partial mediation.

Conclusion

Maternal comments on body shape, weight, and eating behaviors may contribute to negative body image or body dissatisfaction by promoting bodily social comparisons with one's siblings. These results highlight the complexities of sibling dynamics and the role of maternal influences in shaping relationships and body esteem. However, the partial mediation and the small effect size of the indirect effect suggest the existence of additional mediating mechanisms that warrant future studies.

THE IMPACT OF DESIRE DISCREPENCIES ON RELATIONSHIP SATISFACTION

Presenter(s): Maxwell, Zachary, Undergraduate, Psychology

Mentor: Dr. Suejung Han

Authorship: Suejung Han, Zachary Maxwell

Purpose: Sexual desire discrepancy (SDD) refers to the difference of sex drive between individuals in a relationship (Spector, 1996). Affectionate desire discrepancy (ADD) refers to the difference in affectionate desire, such as touching, hugging, or kissing, between individuals in a relationship (Jakubiak, 2021). This study aims to examine the relationship between SDD, ADD, and relationship satisfaction (RS) among college-aged populations. This study also explores college students' strategies for addressing SDD and ADD.

Research has shown that SDD can impact RS between partners (Mark, 2012). Many strategies have been suggested for dealing with SDD (Clark, et al., 2023; Vowels & Mark, 2018) such as communicating sexual desires and talking through discrepancies. However, how college students address them has not been examined sufficiently. College students may provide unique insight into the formation of long-term romantic-relationships during emerging adulthood. I hypothesize (1a) that SDD is associated with RS negatively only when ADD is also high; (1b) that SDD is associated with RS negatively only when communication strategies for SDD are not used. I will also explore the question of (2a) what strategies college-aged individuals use to address SDD and ADD.

Procedure: Participants will be undergraduates enrolled at a Midwestern University, recruited through the psychology department's SONA system for research participation credits. Upon the university's IRB approval, data collection will take place in January and February of 2025. Data analysis will follow in March of 2025 so that data can be presented at the MPA in April 2025.

The online survey of the study will include items for SDD and ADD following Bridges & Horne (2007), the Dyadic Adjustment Scale (Spanier, 1976) for RS, and three short open-ended questions on strategies for handling SDD and ADD, following Clark (2023). Moderated regression analyses will be conducted to test the hypotheses. A theme analysis will be conducted for the exploratory question.

Expected Implications:

With SDD and ADD being a prevalent issue amongst relationships, this study seeks to shed insight on whether there is a correlation between SDD/ ADD and RS in college-aged subjects, as well as identify strategies used by individuals in emerging adulthood (ages 18-29). The results of the study could offer college students practical strategies for enhancing their relationship satisfaction.

APPLICATION OF IDENTITY PLAY ONTO TABLETOP ROLEPLAYING GAMES

Presenter(s): Osman, Farhia, Graduate, Psychology

Mentor: Dr. Eric Wesselmann

This study plans to understand the tabletop roleplaying game (TTRPG) players in their motivations of play, their identification with their character(s), and the individual differences in their personality. Additionally, the research is interested in exploring the practice of roleplaying a character of a different gender than one's own.

There is an existing contention within the game space on how to define roleplaying games (RPGs) as they each have their own purposes of playing (e.g., shared storytelling, simulation). Yet, regardless of form (e.g., TTRPGs; digital video games; live action roleplaying), a shared feature is the player-controlled characters (Bowman, 2010). Although TTRPGs, such as Dungeons & Dragons (D&D), are the predecessor of RPG video games, most research on the individual differences of RPG players has focused on video gamers (Curran, 2011; Yee, 2006). Previous research reported openness to experience being significantly correlated to identification and motivations for playing, thus, this research hypothesizes the findings would apply to a TTRPG player audience specifically (Curran, 2011).

Participants were TTRPG players of at least 18 years old recruited and they completed online survey measures of motivations, identification, and openness to experience facets (Demetrovics, et al., 2011; Looy, et al., 2010; Johnson, 2014).

Bivarate regression analyses will be conducted to assess openness to experience as a predictor of motivation to play and avatar identification. Additionally, multiple regression models will be used to explore the six facets of openness as predictors of motivation and identification. And lastly, an independent samples t-test will be used to explore potential differences of TTRPG players who have played a gender different than their own and those who have not.

The study plans to bridge the gaps of established research avenues of cosplay, video games, and TTRPGs. It will open future research avenues of play and provide further exploration of openness to experience at a facet level.

REPLICATION STUDY ON OSTRACISM AND SELF-ISOLATION THE ROLE OF SHAME AND GUILT RESTRICTING TIMEFRAME

Presenter(s): Rand, Stuart, Graduate, Psychology
Bat-Ireedui, Munkhjin, Graduate, Psychology

Mentor: Dr. Eric Wesselmann

Authorship: Stuart Rand, Munkhjin Bat-Ireedui, Zhi Quan Lim, Eric Wesselmann, Noah Kalmes, Jackson Ahrens

Problem or Purpose

Ostracism is the experience of being ignored and excluded that threatens basic psychological needs (e.g., belonging, self-esteem; Williams, 2009). Ostracism can lead to various behavioral responses, including individuals seeking to isolate themselves from others to avoid future experiences of being ostracized. We conceptually replicate previous studies on preference for solitude after experiencing ostracism (Ren et al., 2016; 2021). Lim (2024) further explored the roles that shame, and guilt may have on solitude-seeking and found mixed results; we designed this study to address previous methodological limitations that may have obfuscated potential experimental effects. We hypothesize that reflecting on an ostracism experience will display increased solitude-seeking, alongside feelings of shame and guilt. We hypothesize that shame will mediate the relation between ostracism and solitude-seeking.

Procedure

Participants (minimum target *N* =71, current *N* = 124) will write about previous experiences. Participants either write about the last time they ate breakfast (control group) or about a time they had been ostracized within the past five years (experimental group). Lim (2024) found that participants varied widely in the timeframe for events that participants chose to recall (some chose a childhood memory, others a recent memory). Though many studies using this paradigm do not find timeframe to be an issue, we elected to restrict the timeframe such that it would involve an ostracism memory tied to their lives as emerging adults. Participants will then complete measures of guilt, shame, and preferences for solitude.

Results

We will conduct a t-test to find expected results that participants who reflect on an ostracism experience will score higher on the solitude scale than participants in the control group. We expect participants' feelings of shame and guilt to follow a similar pattern. We also predicted that participants with higher solitude seeking scores will display increased motivation to seek solitude in the future. Based on previous research, we predict shame will mediate the relation between recalling ostracism and a preference for solitude using the Hayes PROCESS macro. Additionally, we will explore if guilt (a co-morbid emotion with shame) has a mediating role through bootstrapping.

Conclusions and Implications

The study is expected to be completed by February of 2025. The results of this study have implications towards the responses towards ostracism, and the implications of recall towards facilitating the feelings from an ostracism experience. The study has implications for how timeframe affects the relationship between ostracism and solitude-seeking.

COMMUNITY OUTREACH: PARENTAL ENGAGEMENT IN STEAM ACTIVITIES AND DISCUSSION WITH CHILDREN

Presenter(s): Rand, Stuart, Graduate, Psychology

Mentors: Dr. Gregory Braswell

Co-Mentor: Dr. Jordan Arellanes

Authorship: Stuart Rand, Gregory Braswell, Jordan Arellanes

Problem and Purpose

Children's museums are designed to promote children's interests and curiosity, and have found to be effective in communicating STEAM topics (Avraamidou & Osborne, 2009; Wilson-Lopez & Gregory, 2015). STEAM emphasizes the education of science, technology, engineering, art, and math in early childhood, an adaptation to STEM emphasizing creative learning encouraging children to lead their own education. We worked alongside a local children's museum in an outreach program promoting early STEAM education and parental participation. The study focuses on the ability to promote confidence in parents to engage and the facilitation of STEAM learning in the home. We hypothesize that the parents will display increased confidence in engaging with their children in STEAM activities through perceived benefits their children received from the outreach. We hypothesize that parents' own perceptions of STEAM and education will influence confidence to engage, and that the more that parents' feelings of support from the museum will mediate this relationship.

Procedures

Participants consisted of parents of children within local childcare centers that participated in the children's museum outreach. The study contained two parts, separately collected, a quantitative survey (minimum target N = 69, current N = 86) where participants were asked to assess their perception of the effectiveness and benefits from the outreach towards their child's STEAM education and parents' confidence to participate in the learning. The second part consisted of short interviews with parents (current N = 79) on their perspective towards educating children and effectiveness of at home activities in discussing STEAM with their children.

Results

Data is currently being collected and is expected to be completed by February of 2025. Multiple regressions will be conducted on survey results to observe expected results of increased parental confidence based on increased benefits towards children from outreach. Using multiple

regression, we expect increased confidence when parents have higher levels of education and interest in STEAM with support from the museum being a mediator using Hayes PROCESS. Interviews will be coded for aspects of at-home activities that promote effective parent-child engagement.

Conclusions and Implications

The study displays the effectiveness of community organizations towards promoting effective learning, and effective ways to promote increased parental engagement within their children's education. The results may help to develop effective ways to plan further programs that emphasize ways to increase parental interest and confidence to engage with their children, and activities that promote engagement and effective learning within the home.

AI MENTAL HEALTH CHATBOTS: ARE WE READY TO TRUST THEM?

Presenter(s): Rogers, Lauren, Graduate, Psychology
Igoe, Emily, Undergraduate, Psychology
Barrios, Jerania, Undergraduate, Psychology
Kolze, Alannah, Undergraduate, Psychology

Mentor: Dr. Dan Lannin

Authorship: Dan Lannin, Emily Igoe, Lauren Rogers, Jerania Barrios, Alannah Kolze, Michael Barrowclough, David Vogel, Shengtian Wu, Fawzie Khan

Purpose

Demand for mental health treatment continues to outpace the availability of providers (Stringer, 2023). This imbalance leaves many people without timely or sufficient access to care, underscoring the need for innovative solutions. Chatbots could provide a supplementary resource for addressing mental health challenges, especially in underserved or resource-constrained environments (Molli, 2022); however, perceptions of these tools remain unclear (Park et al., 2024). Thus, understanding perceived barriers to using AI chatbots for mental health support is critical for developing appropriate treatments (Koulouri et al., 2022). Therefore, this study aims to assess perceptions of AI mental health chatbots compared to human counselors, identifying potential barriers and opportunities for integrating AI into mental health care.

Procedure

This cross-sectional study surveyed 350 undergraduates, gathering perceptions of human counselors and AI chatbots. Participants completed adapted measures of stigma, disclosure risks/benefits, attitudes, help- seeking intentions, and prior AI experiences. Preferences for combinations of human and AI support (e.g., Human Only, AI Only, Human Primary with AI as Needed, AI Primary with Human as Needed, No Help) were evaluated using Best-Worst scaling procedures.

Results

Most students (62%) were unfamiliar with the existence of AI mental health chatbots, with only 6% having used one for mental health support. Just 14% believed AI could provide care equivalent to human counselors.

Paired t-tests indicated students viewed AI chatbots more negatively than human counselors, with less disclosure benefits, higher self-stigma, worse attitudes, and lower help-seeking intentions (ps < .001); disclosure risks were not significantly different (p = .36).

A Repeated-Measure ANOVA with Sidak correction for multiple comparisons revealed that students equally preferred Human Only and Human Primary with AI as Needed health care, followed by AI Primary with Human as Needed, AI Only, and No Help. All differences were statistically significant (p < .001), except for null differences between Human Only and Human Primary with AI as Needed (p = .38).

Conclusions

Most students had limited experience with AI mental health chatbots and generally held more negative perceptions of them compared to human counselors. However, the finding that a human-primary model supplemented by AI was equally preferred to a human-only model suggests that AI may potentially be used as a complement to human care. Increasing AI literacy and addressing concerns about trust and effectiveness may be essential for integrating AI into mental health services and expanding access.

FUNCTIONAL BEHAVIOR ASSESSMENT INFORMED CONSULTEE-CENTERED CONSULTATION ON BEHAVIORAL INTERVENTION

Presenter(s): Sizemore, Morgan, Undergraduate, Psychology
Carter, Mackinze, Undergraduate, Psychology
Whitehead, Kayden, Undergraduate, Psychology
Dinnsen, Lauren, Undergraduate, Psychology
Hughes, Tamia, Graduate, Psychology
Toney, Taylor, Undergraduate, Psychology
Lafferty, Gina, Undergraduate, Psychology
Guo, Stephanie, Graduate, Psychology

Mentor: Dr. Shengtian Wu

Authorship: Morgan Sizemore, Mackinze Carter, Kayden Whitehead, Lauren Dinnsen, Shengtian Wu, Tamia Hughes, Gina Lafferty, Natalie Picazo, Taylor Toney, Stephanie Guo

Problem:

School consultation is defined as a psychological method used for implementing techniques to help a consultee (e.g., a teacher) who intends to help a client (e.g., a student) with concerning behaviors (King et al, 2023). It helps consultants (e.g., school psychologists) identify underlying causes of student concerns and develop strategies for teachers who will implement them for the students. The need for consultation is highlighted by the interference that student concerns pose toward a teacher's classroom structure, which impacts student productivity and overall performance. The current study measured the effect of school consultation in providing performance improvement in student behaviors, done through the implementation of the interventions developed through consultation.

Procedure:

This study involves a pair of a teacher and a student observed in an elementary school classroom setting. The dependent variable is the student's on-task behaviors, which can be defined as behaviors related to ongoing academic tasks, and the teacher's implementation fidelity, which refers to how accurately the intervention is implemented as designed. To identify student behaviors, researchers conducted teacher interviews and classroom observations, which were used to design interventions to improve the child's behaviors. Teacher implementation fidelity was assessed by calculating the percentage of intervention components correctly implemented. An ABC single case design was used, starting with a baseline phase where dependent variables are measured without intervention, followed by the first intervention phase where the teacher implemented good behavior game intervention. The second intervention phase involved teacher-developed intervention that involves token economy and response cost.

Results:

The result indicated that on-task behaviors under the first intervention phase improved compared to the baseline. The behavior further improved in the second intervention phase relative to the first intervention phase. The teacher's implementation fidelity was also improved in the second intervention phase relative to the first intervention phase.

Implication:

With the ever-changing student dynamic in schools around the nation, many concerns are present such as, productivity, engagement, classroom performance, and declines in teacher motivation. School consultation addresses these concerns by including teachers in the intervention development process, producing improvement in both student behavior and teacher implementation fidelity, often leading to higher rates of acceptability for the proposed intervention. Tailoring interventions to the student not only improves behavioral concerns, but whole classroom engagement and performance collectively. Looking towards the future, discoveries of new interventions will further improve the consultation process.

NATURAL VS. ARTIFICIAL THREATENING SOUNDS ON STRESS RECOVERY

Presenter(s): Walis, Emma, Undergraduate, Psychology
Mentor: Dr. Jeffrey Kahn
Authorship: Emma Walis, Jeffrey Kahn

Of the many methods used to reduce stress after a stressful event, listening to natural sounds aids recovery to a greater extent than artificial sounds (Alvarsson et al., 2010). Natural sounds influence restoration through mood regulation, stress reduction, attention, and health regulation (Benfield et al., 2014). However, some naturally occurring and artificial sounds imply threat (e.g., animal screams, traffic) which can affect brain responsiveness (Erlich et al., 2013). We predicted that non-threatening natural sounds would reduce stress more than artificial sounds. We extended this hypothesis in a new direction with threatening natural and artificial sounds.

College students (N = 86) individually completed a questionnaire within a lab setting. Participants recorded their current emotions (Russell et al., 1989), experienced a brief stress- inducing task (Bostan, 2021), and rated their momentary arousal and valence on a 1–9 Likert scale as a pre-sound measure. They then listened to a 2 min sound clip of one of four randomly assigned clips. These sounds were organized into a 2x2 design with threatening or nonthreatening and natural or artificial categories (i.e., creek, white noise, traffic, and animal screams). Subsequently, they reflected on their post-sound perceptions of valence and arousal and overall stress levels.

Two-by-two repeated measures ANOVAs addressed the influence of threat level and source on stress recovery (valence and arousal) after a stress induction. Participants experienced more of an increase in pleasant affect, $F(1, 49) = 19.37$, $p < .001$ (Fig. 1) and more of decrease in arousal, $F(1, 49) = 4.96$, $p = 0.03$ (Fig. 2) after listening to a non-threatening sound compared to a threatening sound. Source (e.g., natural and artificial) did not impact stress recovery and threat and source did not interact.

Our hypothesis that natural threatening sounds would decrease stress more than artificial threatening sounds was not supported. Perhaps some artificial sounds may be inherently calming and predictable, in contrast to the unpredictable properties of threatening sounds. We found that affect became more positive, and arousal decreased after listening to a low-threat sound regardless of the source. While natural sounds enhance mood recovery to a greater extent than artificial sounds (Benfield et al., 2014), our findings suggest that the threat-level of a sound should be considered independent of source.

ENGAGED AND DISENGAGED COPING: INSIGHTS FROM #METOO TWEETS

Presenter(s): Williams, Sarah, Undergraduate, Psychology
Kuhn, Rory, Graduate, Psychology

Mentor: Dr. Kimberly Schneider

Authorship: Sarah Williams, Rory Kuhn

Purpose:

We examined #MeToo tweets to study differences in coping described by harassment targets. Most previous research on coping with harassment has focused on workplace and school settings, where targets frequently report avoidance of perpetrators (Magley, 2002). We examined a range of coping responses, including cognitive engagement (self-blame, relabeling, and appeasement), behavioral engagement (assertion and reporting), cognitive disengagement (detachment, denial, and endurance), and behavioral disengagement (avoidance and seeking social support).

Less is known about coping with harassment in settings outside work or campus contexts. #MeToo tweets described a broader range of settings, including public and social situations. We expected that coping described in tweets would parallel previous workplace harassment research. Reluctance to engage in assertive coping is often based on concerns about retaliation or skepticism about reporting. We examined differences in coping based on setting and harassment type.

Project Methodology:

We gathered #MeToo English language tweets from the 24 hours following the initial use of #MeToo on Twitter (10/15/2017). Three raters content-coded a random 1,000 tweets (> 95% agreement) into coping strategy categories using the Coping with Harassment Questionnaire (Table 1) and based on setting (Table 2) of the disclosed incident.

Results:

Of the 912 tweets that included details of the harassment, most incidents occurred at work (31.9%), school (18.5%), or on the street (14.5%). Harassment type was most frequently unwanted sexual attention (36.2% of incidents), assault (10.7%), or threatening/stalking behaviors (10.7%). We conducted chi-square tests to examine significant differences in coping based on harassment type. Behavioral engagement (i.e., assertiveness) was used significantly more often for those who disclosed unwanted sexual attention and

threats/stalking than for those who disclosed sexual assault or gender harassment ($\chi 2$ (4) = 27.77, $p < .001$). There were not significant differences in other coping strategies across harassment types. Based on setting, there was only a significant difference in behavioral engagement; it was used significantly more often in work, school, and street harassment than in social/dating contexts ($\chi 2$ (3) = 16.52, $p < .05$).

Implications:

Our study of #MeToo tweets illustrated similarities and differences in how harassment targets coped with incidents compared with samples in previous research. Those disclosing harassment or assault using #MeToo were generally more assertive compared to employee samples. This may be a function of the type of incidents disclosed on Twitter. Next steps will include linking descriptions of behaviorally engaged coping behaviors with resolution of the harassment incident linking descriptions of behaviorally engaged coping behaviors with resolution of the harassment incident.

SPECIAL EDUCATION

SYSTEMATIC REVIEW OF COLLEGE AND CAREER READINESS PROGRAM CONSTRUCTS FOR STUDENTS WITH DISABILITIES

Presenter(s): Brobston, Stacy, Graduate, Special Education

Mentor: Dr. Yun-Ching Chung

Authorship: Stacy Brobston, Yun-Ching Chung

Federal laws mandate schools to develop individualized transition plans and set high academic standards to prepare students with disabilities with skills necessary for collage and career. While many schools have developed college and career readiness (CCR) programs to support all students transition to the postsecondary setting, there continues to be a gap in the success rates between students with and without disabilities. In addition, research is unclear on what constructs are essential for students with disabilities. We conducted a systematic literature review to examine studies that evaluated CCR constructs essential for students in high school with disabilities. Twelve studies met the inclusion criteria, including seven quantitative, three qualitative, and two mixed-method studies. We organized the results based on the type of study and then compared the results of the quantitative and qualitative research to each other. Results indicated family involvement, community networking, and teaching of social and communication skills as essential CCR constructs for students with disabilities. Most of the quantitative studies reviewed met the Council for Exceptional Children (CEC) quality indicators with no reservations. The qualitative research studies included met the CEC quality indicators with some reservations. Findings suggest a need for schools to incorporate the essential CCR constructs into their programs, expand their knowledge of community resources, and use quality assessments to identify students' strengths when developing an effective transition plan for college and careers.

PROMOTING STUDENT SUCCESS THROUGH POLICY: APPLYING CULTURALLY RESPONSIVE PRINCIPLES TO TEACHER ADVOCACY

Presenter(s): Chlada, Anabella, Undergraduate, Special Education

Mentor: Dr. Debbie Shelden

Authorship: Anabella Chlada, Debbie Shelden

As a preservice educator, I am interested in understanding how policy and legislation impact my future students. In this presentation, I will share my learning related to how intersectionality must be addressed in policy initiatives and how educators can advocate for policies–federally but also in their schools–that target inequities in our schools. I will share my learning from Intersectionality in Education and from my participation in the Council for Exceptional Children/Council of Administrators of Special Education (CEC/ CASE) Special Education Legislative Summit and discuss implications, particularly for emerging and new educators.

DIGITAL WRITING IN EARLY CHILDHOOD EDUCATION

Presenter(s): Anderson, Gina, Graduate, Teaching and Learning

Mentor: Dr. Terry Husband

This study is looking at digital writing practices and the impact it may have on students' motivation and pride in their work in early childhood classrooms. The goal of this study is to see if digital writing will increase student motivation and increase students' pride in their work. Participants will be one class of kindergarten students. The participants will be selected based on parent permission and the students' willingness to be included in this study. The results of this study are coming soon.

BEYOND THE CLASSROOM: HOW INFORMAL LEARNING ENVIRONMENTS IMPACT STUDENT LEARNING

Presenter(s): Boudreau, Kendall, Graduate, Teaching and Learning

Mentor: Dr. Anna Smith

As children begin preschool, various techniques, approaches, and environments foster their social, emotional, and academic growth. Preschool aged children need hands-on learning opportunities that are embedded in their communities and immediate environments to support their learning. The purpose of this study is to better understand how informal learning environments support students' learning. To better understand how informal learning environments support student learning, this study immersed children into a learning unit about their local post office, and offered students the opportunity to meet with local postal workers and attend a field trip to the local post office. Small group interviews were conducted with participants, along with observations during free play, gross motor activities, and small group sessions in the classroom. Additionally, a detailed running record and various artifacts were collected during the field trip. Based on the data collected through these methods, the potential impacts on learning include increased dramatic play, expanded vocabulary, enhanced peer collaboration, and a heightened curiosity to learn new information. In addition to this, tentative findings suggest that students feel more connected to their community by making real world connections to new information. Overall, based on these preliminary findings, students need a variety of opportunities and environments to engage on a deeper level through informal learning opportunities to promote their language, social and emotional learning, increase content knowledge and make connections to the world at large.

REDUCING FOREIGN LANGAUGE ANXIETY IN HIGH SCHOOL LANGUAGE LEARNERS DURING PRESENTATIONAL SPEAKING EVENTS

Presenter(s): Bryk, Alexander, Graduate, Teaching and Learning

Mentor: Dr. Anna Smith

Authorship: Alexander Bryk

In foreign language courses, presentational speaking is often a source of major anxiety for students, who see the task as an upcoming source of negative evaluation (Ansari, 2015). While some students dare to perform the task of speaking a foreign language in front of others in the face of stress and anxiety, teachers have seen others cope with the situation by skipping class on the day of a presentation, asking for an extended deadline at the last minute, requesting to perform their presentation without an audience, or even neglecting to complete any of the work required for the assignment and opting to take a zero for the assignment rather than confront the source of their uneasiness. Naturally, the avoidance of an assignment is concerning for the threat that it poses to a student's academic growth. However, this is a symptom of greater problems, specifically that students do not practice the communication skills required to inform their teacher that they require assistance in order for them to prepare for a presentation or the anxiety management skills required to prepare to perform the task on time and in front of an audience. Based on the American Council on the Teaching of Foreign Languages' World Readiness Standards, many world language classrooms now include a focus on inter- disciplinary knowledge and skills that are transferrable to situations outside the world language classroom. As a course such as the one outlined by Pulker (et al. 2021) demonstrates, the ability to self- advocate, communicate, and problem-solve on one's own is certainly transferrable to situations beyond the world language classroom, and among the many skills that world language instructors would like to see their students develop. By discovering and explicitly teaching strategies to help language learners manage their anxiety, teachers can help students to grow more confident in the language abilities, develop a positive attitude towards their language-learning endeavor, and develop useful skills that they can employ long past the end of their language courses. So far, survey results from students indicate that they are generally confident and have an overall positive attitude towards language learning and speaking in front of others, contingent on their feeling prepared. Therefore, an intervention that successfully prepares students for a presentational speaking event by making them feel confident will likely be effective in helping their proficiency in that setting.

SMALL GROUP WRITING INSTRUCTION

Presenter(s): Cantrell, Kate, Graduate, Teaching and Learning

Mentor: Dr. Terry Husband

Research question: How can small group instruction be meaningful for all types of writers?

The purpose of this study is to examine small group instruction through skill-based support during writing instruction. Small groups will meet twice a week for 15 minutes during writing workshop over a 6-week period of time. Students will work on a specified writing skill based on their pre-assessment score. These skills include the use of conventions, organization of writing, use of language, or details and ideas. Each small group will have different instructional activities based on the skill. Data will be collected through pre assessment and post assessment rubrics and formative observations.

INSTRUCTIONAL COACH'S IMPACT ON TEACHERS' NEEDS

Presenter(s): DeBruyne, Brianna, Graduate, Teaching and Learning

Mentor: Dr. Megan Kessler

Teachers continue to have responsibilities and expectations added to their plates, while little to nothing is being taken off. Students are harder to reach, and their attention spans are significantly lower than in years past. How can we, as teachers, compete with the growing list of to-do´s and still implement best practices? How can instructional coaches use coaching cycles to support classroom teachers in their building? Participants in this study include teachers with varying levels of experience. They are 4th-6th grade classroom teachers who participated in a co-planning or full coaching cycle with an instructional coach. Surveys and interviews will be collected at the end of each coaching cycle. Surveys include results on a likert-scale so that results can be quantified and graphed. Teachers expressed gratitude and appreciation for having help in their classrooms, whether it involved planning together or planning, teaching, and assessing together. Surveys showed their instructional coach was helpful and most were able to implement planning and teaching on their own following the coaching cycle. Based on these tentative findings, teachers found that coaching cycles led them to being more confident and prepared for planning future units. Both full coaching cycles and co-planning cycles with an instructional coach were considered to be effective methods for supporting teachers.

THE IMPACT OF INTENSIVE PHONICS INSTRUCTION ON TIER 3 UPPER ELEMENTARY STRUGGLING READERS

Presenter(s): Dorantes, Jeanette, Graduate, Teaching and Learning

Mentor: Dr. Terry Husband

There has been much research on which method is best in teaching children to read. Educators have wondered if it is phonics, whole language, or something different. The majority of this research is focused on primary-grade students who are just beginning to learn to read. The research is not as robust with the older students. What about the upper elementary student who is still struggling with decoding, not just reading comprehension. Donegan and Wanzek (2021) explain that "older struggling readers may demonstrate difficulties in foundational skills such as word reading, or more advanced skills such as comprehension of text, or they may struggle in both domains." (p.1944)

Research shows that students are still struggling with decoding and fluency beyond the primary grades. This is a problem since at this age students are no longer learning to read in class, but they are reading to learn content. According to Boucher et al, 2024, "Students who experience WRD (Word Reading Difficulties) beyond Grades K–2 are doubly disadvantaged: word reading instruction is no longer the primary focus of core classroom instruction (Chall, 1983) and the texts students encounter only increase in difficulty (Leach et al., 2003)" (p.1). These students still need intensive interventions that include phonics. Wanzek et al., (2013) describe reading difficulties in older students, "Other students in Grades
4 and beyond demonstrate reading achievement more than two grades below expectations and are unable to read grade-level text, thus demonstrating more significant word reading and fluency problems as well as vocabulary and comprehension difficulties (Cirino et al., 2012)" (p.165). This supports the fact that if a student cannot decode, they will then continue to struggle with vocabulary and comprehension.

The purpose of this study is to explore the result of teaching explicit phonics for reading intervention to upper elementary students. I plan to answer the question, *How does intensive phonics intervention support upper elementary students' growth in luency and their attitudes toward reading?*

At the completion of this study, interventionists, classroom teachers and students will benefit the most. This study will give teachers the insight needed to best teach struggling readers. Interventionists will have the knowledge of how to best support this group of older students. The group that will benefit the most will be the struggling readers. Hopefully the findings will lead me to what intervention will best serve this group of students. I plan to take the findings to share with my team of interventionists at my school and hopefully we can all implement what is found with our upper elementary students.

EARLY CAREER EDUCATORS' EMOTIONAL EXPERIENCES

Presenter(s): Eaton-Willyard, Rachel, Graduate, Teaching and Learning

Mentor: Dr. Meghan Kessler

The emotional experience of teaching can be difficult for veteran teachers to grapple with, but early career educators who are learning their profession as well as navigating their mental well-being experience additional stress and may begin to question if they will remain in the profession in subsequent years. This study sought to investigate how the emotional experiences of early career teachers affect their outlook on their profession. The participants included early career educators, defined as those in the first five years of their careers, who were in a k-12 school and part of their union. The chosen district was highly diverse regarding race, ethnicity, language, and socio-economic status and was in an urban setting. Surveys were analyzed to find perceptions of stress levels before, during, and after the school day, and to find potential sources for stress. Interviews were transcribed and coded for themes to uncover early career educators' specific emotional experiences within their field. Overall, early career educators reported they found their jobs somewhat stressful and stressful, which interrupted sleep schedules and manifested in physical symptoms. The teachers reported that their union supported them and that they were not planning on leaving the teaching profession. Based on tentative findings, unions should connect with their early career members to ensure they are finding the support they need while at school.

DIFFERENTIATED INSTRUCTION & INTERVENTION TO ACCELERATE LITERACY GROWTH FOR ALL STUDENTS

Presenter(s): Fiedler, Kayla, Graduate, Teaching and Learning

Mentor: Dr. Terry Husband

With the current cultural, academic, and linguistic diversity in today's classrooms in the United States, differentiated literacy instruction is a necessity. Although much research exists on differentiated reading instruction and intervention, a significant number of fourth-grade students nationwide (over 60%) continue to fail to achieve reading proficiency (NCES, 2022). Beginning reading teachers play a pivotal role in early identification of reading difficulties, intervening early to prevent students from falling behind, and differentiating their instruction to promote reading achievement for all students. However, a problem occurs when schools and teachers implement reading instruction that does not meet the specific reading needs of their student (both proficient and nonproficient readers). As schools continue to implement a variety of literacy curricula and practices, this research provides insights into differentiated instruction and intervention that reflect the expertise of elementary literacy teachers and specialists (kindergarten through fifth grade) and the diversity of students' reading needs. This study examines how teachers' early literacy skill knowledge, beliefs about student support, and confidence levels in supporting students may affect the differentiated instruction and/or intervention they implement in their classroom. Utilizing a mixed methods approach, I am blending qualitative and quantitative data collection methods (Efron & David, 2020) to survey and interview teachers, and to analyze their Tier 1 and Tier 2 (if applicable) lesson plans. Since this study is conducted at a small school with small class sizes, every classroom teacher also acts as an interventionist, hence the request of Tier 2 intervention plans as well. Survey responses will be analyzed for: teachers' knowledge of code-focused and meaning-focused components of literacy instruction; teachers' perception on how often their students need additional support with specific literacy practices; and teachers' perception of their confidence levels in providing instructional support with specific literacy practices. The learning objectives and utilization of differentiated instruction and/or intervention based on students' individual needs will be evaluated within their submitted lesson plans. Following the completion of the survey and submission of lesson plans, individual interviews will be conducted to gain a detailed description of the decision-making processes behind the teachers' means of differentiation. I am currently collecting and analyzing the data with the full findings and implications forthcoming.

EXAMINING PRAISE IN MIDDLE SCHOOL CLASSROOMS

Presenters(s): Gillaspie, Jocelyn, Graduate, Teaching and Learning

Mentors: Dr. Terry Husband

Co-Mentor: Dr. Robyn Seglem

Authorship: Jocelyn Gillaspie, Terry Husband, Robyn Seglem

Survey data from the 2021-2022 school year revealed that teachers reported an increase in disruptive behaviors in the classroom, disrespect of teachers, and rowdiness outside of classrooms since before the COVID-19 pandemic (National Center for Education Statistics, 2022). Anecdotally, teachers report that students are more dependent learners and reluctant to take academic risks in their classrooms. The "tough love" philosophy found in secondary classrooms likely intensifies these issues. In an attempt to identify what motivates students and how to create more positive classroom climates, this study examines the types of praise currently in use in middle school classrooms, and how these praise habits align with student preferences for praise. This study focuses on teachers and 6th and 8th grade students at a suburban middle school. The researcher plans to use a combination of surveys and interviews to gather data about the types of praise middle school teachers currently use in their classrooms, along with journaling and interviews to establish patterns in middle school students' preferences for praise. At this time, findings are tentative.

MOTIVATING THE RELUCTANT LEARNER

Presenter(s): Gress, Krista, Graduate, Teaching and Learning

Mentor: Dr. Anna Smith

Student engagement is essential to the learning process across content areas. Many professional development opportunities for educators focus on implementing different learning strategies in order to spark student interest and create or increase motivation to learn. Students also learn strategies through social emotional learning classes and minilessons conducted throughout the year. Parents, who know their child's work ethic from a different standpoint, may also offer insights on how they motivate their child to complete tasks presented to them in the educational environment. Therefore, this study explores the different strategies that teachers, students, and parents use to inspire and sustain a love of learning.

In this study, I will be collecting data about motivational strategies that work by interviewing teachers, students, and parents. I will interview teachers about what strategies and actions have worked for them when helping students who are reluctant to engage with the classroom lessons and assignments. I will also interview students one-on-one in a separate setting. Lastly, I will ask parents to answer survey questions about how they motivate their child outside of school. With a mixed methods approach, this study aims to gather data about motivational strategies that students, teachers, and parents use in order to engage and inspire reluctant learners. As stated by Efron and Ravid (2020), "The mixed-methods approach proposes to cross boundaries between worldviews and blend (or combine) qualitative and quantitative research methods and techniques into a single study" (p. 50). To gather quantitative data, a survey will be sent out to the parents of current 6th, 7th, and 8th grade students. The survey will be reviewed for commonalities and differences in parent perspectives on their child's motivation to learn and the strategies they use to keep their child engaged and inspired. In addition, the study will conduct three to five teacher interviews and three to five student interviews to collect qualitative data on motivational strategies used by both parties.

At this point in time, I do have any tentative findings besides classroom observations of 7th and 8th grade students. The students in these classes vary in how much they feel motivated at school. Ultimately, research needs to take place and data needs to be collected in order to draw conclusions regarding the motivational views of students, teachers, and parents.

LEADERSHIP CHARACTERISTICS AND SUPPORTS: THEIR EFFECTIVENESS IN EMPOWERING THE FUTURE OF TEACHERS POST-PANDEMIC

Presenter(s): Halfman, Grace Elizabeth, Graduate, Teaching and Learning
Gross, Laura, Graduate, Teaching and Learning
Klein, Kelly, Graduate, Teaching and Learning

Mentor: Dr. Anna Smith

Authorship: Grace Elizabeth Halfman, Laura Gross, Kelly Klein

In the wake of the COVID-19 pandemic, teacher retention has been a growing problem. Thirty percent of new teachers leave the profession within the first five years (Ronfeldt et al., 2013). In addition, around two-thirds of teachers leave the teaching profession for reasons outside of retirement (Sutcher et al., 2019). The reasons for high teacher turnover are varied, but the way it negatively affects student achievement is acute (Ronfeldt et al., 2013). Teacher shortages place a significant burden on school districts, particularly school principals. To increase teacher retention, school administrators must find effective ways to support teachers. Many teachers recognize that they need support, but what specific support would be effective enough to influence them to stay in this post-pandemic climate?

This study utilizes a mixed-methods research approach to examine effective leadership characteristics and supports that positively affect teacher retention. This research combines quantitative surveys with qualitative interviews to gather perspectives from various stakeholders--teachers, school administrators, and principal preparation programs. Data collection includes digital surveys and semi-structured interviews, focusing on leadership styles, communication, support strategies, teacher autonomy, and work-life balance.

Tentative findings suggest that effective leadership, characterized by empathy, strong communication, and support for professional development, plays a crucial role in teacher retention. Early data also shows that educators highly appreciate principals/administrators who provide autonomy in the workplace, value their well-being, and foster a positive and supportive school culture and climate. All in all, these leadership practices help reduce burnout and enhance job satisfaction, both of which are key factors in improving teacher retention.

Overall, this research study aims to improve teacher experience in schools to lead to higher retention rates across the board. This study will help to provide insights into the specific leadership traits that contribute to a positive work culture. These findings will empower educators and administrators to collaborate more effectively, leading to improved teacher retention rates.

CULTURALLY RESPONSIVE PHONICS: EDUCATORS BUILDING LITERACY DEVELOPMENT IN DIVERSE CLASSROOMS

Presenter(s): Hochstetler, Samantha, Graduate, Teaching and Learning

Mentor: Dr. Terry Husband

This research employs a qualitative approach to investigate the specific challenges K-2 teachers face when implementing culturally responsive phonics strategies and identifies the instructional methods they find most effective for skill development in diverse classrooms. Focusing on a charter school serving primarily low-income students, the study involves K-2 teachers responding to a Qualtrics survey addressing their understanding of phonics instruction, challenges in executing their current phonics curricula, supplemental resources, curriculum effectiveness, student engagement, and differentiation strategies. The research underscores the importance of addressing the literacy gap in students, particularly for beginning or struggling readers, as foundational reading skills developed from kindergarten to second grade are crucial for future success. It also highlights the barriers these students encounter, such as socioeconomic challenges and varying language proficiencies, emphasizing the need for educators, administrators, and curriculum developers to consider these factors to better support diverse learners.

THE IMPACT OF EXPLICIT VOCABULARY INSTRUCTION ON STUDENTS' READING CONFIDENCE IN FIRST GRADE

Presenter(s): Jennings, Catherine, Graduate, Teaching and Learning

Mentor: Dr. Terry Husband

The purpose of this study is to examine the impact of explicit vocabulary instruction taught in a small group setting on the reading self-efficacy of first-grade students by asking the question: What is the impact of explicit vocabulary instruction in a small group setting on the reading self-confidence of first-grade students?

Explicit vocabulary instruction is a critical piece to student reading success. An overlooked aspect of reading success is strong reading self-efficacy. This study will examine the impact of explicit vocabulary in a small group setting on the reading confidence of first-grade students. The explicit vocabulary lessons will be administered in two different small-group settings. I will collect pre and post-lesson survey results from first-grade students twice a week. Currently, there are two trends emerging from the data. First, students who struggle with reading show improved reading self-efficacy in the data, as do students who read above grade level. Students who are reading at or around grade-level are not showing growth in their reading self-efficacy at the moment. Additionally, survey results show that students do find value in explicit vocabulary instruction in the classroom. The final results of this study will be disseminated in journals, conferences, and professional development settings.

READING FLUENCY INTERVENTIONS: REPEATED READING VS. INTERVAL SPRINTING

Presenter(s): Keirn, Christy, Graduate, Teaching and Learning

Mentor: Dr. Terry Husband

This study will examine the effects of two different intervention programs, repeated reading and interval sprinting, on reading fluency in seven 2nd-grade students. The research will compare how these interventions impact the students' reading comprehension and word recognition. One group will participate in a repeated reading program, focusing on reading familiar texts multiple times to improve fluency, while the second group will engage in interval sprinting sessions. The results will provide insights into how these interventions may enhance reading skills in early learners.

THE IMPORTANCE OF PLAY IN LITERACY

Presenters(s): Langusch, Lisa, Teaching and Learning

Mentor: Dr. Terry Husband

The increasing emphasis on curriculum standards in kindergarten has led to a reduction in play-based learning, with some districts limiting play to less than thirty minutes per day. Research clearly demonstrates the benefits of play-based learning and outlines strategies for its effective use in the classroom. However, there is a lack of research addressing how play-based learning can specifically support literacy development. Over the past decade, educational leaders such as administrators, principals, and state representatives have made significant changes to how play is incorporated in kindergarten classrooms. Previously, kindergarten was centered around independent play with materials like blocks, Magnatiles, Legos, Lincoln Logs, and pretend play. However, with the introduction of Common Core and updated state standards in Illinois in 2010, curriculum and instructional priorities shifted, leading to time constraints that limit play in the daily schedule. As curriculum demands increased, play was relegated to a secondary role, resulting in a significant reduction in play-based learning each year. This study examines teachers' perceptions and experiences of integrating play into their literacy instruction using a mixed-methods approach. Two preschool teachers, four kindergarten teachers, and two first-grade teachers from Ivy School District completed a quantitative survey on the role of play in their daily literacy blocks. A follow-up qualitative survey explored their feelings and strategies for incorporating play into literacy instruction. Classroom observations were conducted to document how and to what extent play was used during literacy sessions in preschool, kindergarten, and first-grade classrooms. The findings indicate that play has significantly diminished in elementary classrooms over the past decade. While teachers acknowledge the importance of play, they are finding creative ways to incorporate it within their literacy curriculum whenever possible. The study concludes that it is essential for early elementary educators to integrate play into their literacy instruction, as it provides valuable support for young learners' development.

CLASSROOM MANAGEMENT WITHIN SMALL GROUP INSTRUCTION FOR MULTI- AGED STUDENTS

Presenter(s): Mitrega, Olivia, Graduate, Teaching and Learning

Mentor: Dr. Anna Smith

Classroom management is an important factor in creating an effective learning environment, especially in settings where teachers work with students across multiple grade levels. This study focuses on the impact of consistent classroom management strategies on student engagement and success during small group instruction. The research is conducted within a Polish bilingual/ESL classroom serving students in grades K-5. The participants include four first-grade students (with varying language proficiencies, including Polish and Ukrainian speakers) and four fifth-grade students (representing a mix of linguistic backgrounds, including Ukrainian, Mandarin, Lithuanian, and Albanian). Additionally, three teachers who specialize in small group instruction across multiple grades will also be involved in the study.

A qualitative research design is employed, utilizing surveys, interviews, and classroom observations to collect data. Preliminary findings indicate that inconsistent classroom management strategies, such as varying approaches between younger and older students, can hinder both student behavior and academic progress. Also, the “token economy” system, used with older students, has shown some success but is affected by a lack of consistent follow- through. Initial observations suggest that students' behavior is often influenced by the teacher’s approach to classroom management.

This study aims to contribute to the existing literature on classroom management, specifically within small group settings, and will offer insights into effective practices that promote consistency across grade levels. The implications of this research are significant for improving classroom management techniques in diverse, multi-aged classrooms, potentially benefiting both teachers and students by providing a more cohesive and effective instructional experience.

STUDENTS' AND TEACHERS' PERCEPTIONS OF SEL CURRICULA IN ELEMENTARY SCHOOLS

Presenter(s): Muzzarelli, Kristin, Graduate, Teaching and Learning

Hedge, Jordan, Graduate, Teaching and Learning

Mentor: Dr. Anna Smith

As mental health continues to take a greater focus in the eye of the general public, especially after the COVID-19 pandemic, there has been a national push to prioritize social-emotional learning in schools. This study explored teachers' and students' perceptions of SEL curricula to continually improve such instruction to meet the needs of today's learners. Teachers and students within two districts in central Illinois, with varying levels of racially, ethnically, and linguistically diverse student bodies, were surveyed, and a smaller sample of teachers and students were interviewed. Both quantitative and qualitative data were drawn upon for a mixed methods research approach. The survey and interview responses were analyzed to identify patterns in educators' and students' views based on their experience with SEL instruction and curricula. Overwhelmingly, teachers noted the importance of SEL curriculum and instruction in their classrooms for their students along with a multitude of factors that impede the effectiveness of such learning, such as a lack of student interest, engaging lessons, class time to implement lessons, and resources available within their respective curriculums. Initial responses from students have indicated that they recognize the importance of SEL lessons and activities while also reporting increased confidence in using the various SEL skills they learn in daily life. Based on the current findings, we recognize the necessity for school districts to seek out both teacher and student input when exploring new resources and curricula for SEL. With teachers and students being the primary stakeholders in the relevancy and success of the curricula, it is imperative that their wants and needs be considered before allocating resources to purchase these materials.

DEMYSTIFYING NATIVE SPEAKERISM IN ENGLISH TEACHER EDUCATION

Presenter(s): Narongsaksakul, Watsachol, Graduate, Teaching and Learning

Mentor: Dr. Ellis Hurd

Authorship: Watsachol Narongsaksakul

This presentation explores native speakerism —the problematic division between native English speakers teachers (NESTs) and non-native English speakers teachers (NNESTs)—resulting in the controversy surrounding desirable English language teaching professional identity. This critical issue informs ideological beliefs about the English language as a property. The most recent theoretical foundations address the privilege of NESTs that should be detached from a Western approach. Acknowledging power differentiation is another consideration that reinforces NNESTs' valuable cultural and linguistic backgrounds and imposes an unrealistic standard of language articulation and production.

UNPACKING AI PEDAGOGY FOR K-12 EDUCATORS OF MULTILINGUAL LEARNERS (MLs)

Presenter(s): Narongsaksakul, Watsachol, Teaching and Learning

Mentor: Dr. Ryan Brown

Authorship: Watsachol Narongsaksakul

Despite the change to a pluralistic society in the US educational landscape, K-12 educators are still determining the applications of artificial intelligence in education (AIED) and recognizing the need for adaptations. This presentation aims to explore the means by which AI pedagogy supports educators in teaching multilingual learners (MLs). AI pedagogy is addressed to enrich diversity and codesign the MLs lessons to be more culturally responsive teaching with AIED. Three usages of AI pedagogy will be discussed: (1) creating personalized learning materials, (2) engaging in interaction and collaboration with chatbots, and (3) using stimulation through intelligent virtual reality (IVR).

TRANSFORMING TEACHER PREPARATION PROGRAMS WITH AI LITERACY

Presenter(s): Narongsaksakul, Watsachol, Graduate, Teaching and Learning

Mentor: Dr. Ryan Brown

Authorship: Watsachol Narongsaksakul

This presentation entails the most current research to enhance preservice teachers' (PSTs) AI literacy. Twenty-two US states have issued AI guidelines that underscore the importance of AI literacy (Kosta, 2024). As non-AI experts, PSTs are encouraged to explore AI curricula enhancement and integration in their classrooms (Chiu, 2022). Owing to the pressing need to refine AI literacy in different contexts, this movement requires non-AI experts to determine professional knowledge and skills (Laupichler et al., 2022). Therefore, PSTs are equipped with professional knowledge to educate students effectively while augmenting their workflow. Co-design teaching and learning with AI prioritizes PSTs' agency, enhancing the contextual usability and application as AI infusion makes critical decisions to the student's academic achievement success and bridges the equity and inclusion gap in K-12 education.

AI IN THE PRIMARY GRADES

Presenter(s): Obispo Serrano, Concepcion, Graduate, Teaching and Learning

Mentor: Dr. Terry Husband

This study was designed to investigate how primary school teachers perceive AI education and its impact on student engagement. 50 teachers across the United State were surveyed and 5 were interviewed based on their willingness to participate and their responses. To identify any recurring themes and patterns a contingency table analysis was employed. Recurring themes and patterns were used to generate follow-up questions for the interview phase. Interview response was analyzed using thematic content analysis to identify common themes and patterns in their responses. Findings will be forthcoming.

ELEMENTARY TEACHER MOTIVATIONS AND IMPLEMENTATION OF ABILITY GROUPING FOR READING INSTRUCTION

Presenter(s): O'Neill, Elizabeth, Graduate, Teaching and Learning

Mentor: Dr. Terry Husband

Teachers are constantly on the quest of supporting student growth by gathering data, analyzing it, and modifying their lessons and strategies. As reading scores have been in decline, teachers have been gathering data and wondering, *what else can I do?* This study analyzes the motivations and practices of elementary school teachers who believed ability grouping for reading instruction could be the answer to this question. Historically, ability grouping for reading instruction has not been beneficial for all students, specifically those in the lower ability group. This leads to the question of why teachers would choose this method and what they do differently in an ability-grouped setting than a mixed-ability setting to benefit all students. This study begins with a survey of elementary teachers from across the United States who have used ability-grouping for reading instruction. A smaller group of four third grade teachers are in case study which collects interviews, lesson plans, and lesson observations. As the study progresses, these interviews will be analyzed using an open coding method to identify common themes within teachers' motivations for ability grouping and their perceptions of it once the practice was implemented. This method will also identify the variation of teaching practices within ability groups. At this time, the survey of 43-participants suggests that elementary teachers utilizing ability grouping for reading instruction are mostly working with students that are 1 or 2 years below grade level. Overwhelmingly the most implemented practice for these groups is direct teacher instruction; however, 84% of teachers surveyed believed that ability grouping would support differentiation for their students. In initial interviews with the case study, teachers believe that they are able to better differentiate for their students and feel satisfied with the growth that is being made. They share that students feel more ownership of their work and are still working towards the same grade level standards, just at different rates and with a variation of scaffolds. These tentative findings suggest that while teachers mostly implement ability grouping to support students who are not yet on grade level, they are not typically deviating from whole group instruction. Even though the majority of teachers describe their motivation for ability grouping as increased differentiation for students, their differentiation tactic is their approach to whole group lessons rather than specific, individualized skills for the students within their ability group.

CAUSES AND IMPACTS OF TEACHER BURNOUT ON SECONDARY EDUCATION TEACHERS

Presenter(s): Peters, Joshua, Graduate, Teaching and Learning

Mentor: Dr. Meghan Kessler

Authorship: Joshua Peters

Post-COVID, more than ever, teacher burnout has become a major cause for concern. As teaching continues to change, due to technological changes, new laws, trends in education, and tumultuous political climates, teacher burnout needs to be addressed. The factors that seem to contribute most heavily to reducing teacher burnout are support with LMSs, support from administrators, an emphasis on teacher mental health and autonomy, and also sound financials in terms of district resources and salary. The participants for this study will be secondary educators in the American Midwest. Participants for the survey portion will be selected through snowball sampling. This approach will allow data to be gathered from multiple high schools and potentially reach a larger number of educators in many unique contexts, as opposed to using one research site. The fear is that an isolated research site could add bias to the results, given that the participants will have more similar experiences, as opposed to a broad approach where educators would be weighing in from different schools and districts. The primary mode of data collection will be rating scale (Effron & Ravid, 2020), in which participants will rate their experience with burnout and other stressors and provide a small amount of demographic data which will include experience in education as well as subject area. This will be used to collect larger amounts of data from teachers in central IL, primarily. The second method will cover qualitative data collection. A structured survey, which uses preset questions in a particular sequence (Effron & Ravid, 2020), will be used to gather detailed teacher perspectives with comparable data. This design will allow for broader trends to be analyzed through survey data, and also have that data be contextualized through interview data from unique teacher perspectives collected in interviews. Tentative findings show that teachers find similar stressors to be factors in burnout as previous research, however student behavior has been a very prominent indicator of teacher stress and burnout as well. In interviews, teachers from different levels of experience shared similar stressors – primarily workload and student behavior-based – and mentioned that administrative support was a crucial piece in the puzzle. Based on these findings, administrators should focus on finding ways to minimize teacher workload and support teachers with behavior-issues to mitigate burnout.

INVESTIGATING STUDENT ENGAGEMENT AND INDEPENDENCE THROUGH OWNERSHIP IN LITERACY CENTERS

Presenters(s): Poskonka, Bryann, Graduate, Teaching and Learning

Mentor: Dr. Anna Smith

In structured literacy centers, students often follow pre-assigned tasks, limiting opportunities for autonomy and engagement. This study explores how giving first-grade students ownership of their literacy activities impacts their engagement and independence. Nineteen students from a diverse suburban elementary school participated in this study, engaging in a mix of teacher-directed and choice-based literacy centers. Data collection methods include structured classroom observations, semi-structured student interviews, goal-setting conferences, and artifact collection, analyzed to identify patterns of engagement, persistence, and autonomy. Preliminary findings suggest that students given the opportunity to choose their activities show greater motivation, creativity, and independence compared to those in structured literacy tasks. Additionally, students who participate in goal-setting conferences exhibit higher levels of self-regulation and ownership of their learning. However, some students still require guidance to transition from structured to independent learning. These findings suggest that integrating choice and structured goal-setting within literacy centers may enhance student engagement and promote self-directed learning. Future research should explore how different levels of autonomy impact various learning styles and how teachers can scaffold independence effectively.

EVALUATING HOW DIRECT INSTRUCTION READING PROGRAMS AFFECT FLUENCY GENERALIZATION SKILLS IN SPECIAL EDUCATION

Presenter(s): Sarno, Rachel, Graduate, Teaching and Learning

Mentor: Dr. Terry Husband

Promoting the generalization of oral reading fluency has been a topic in special education for many years. The science of reading has promoted structure and explicit instructions for students to learn how to read, but there could be cons in generalizing outside of specific direct instruction programs. This study's significance is to learn more about how special education students are generalizing skills they learn in direct instruction reading programs. The participants of this study are students who are a part of a self-contained classroom where they receive most of their core instruction and integrate into the general education classroom for specials and social opportunities. These students all qualify for instruction through their Individualized Education Plans. A sample of general education teachers and special education teachers will be interviewed to compare their personal findings with direct instruction and the data found in this study. As a special education teacher, I have the opportunity to watch other staff members implement direct instruction on a daily basis. I will be completing two observations to see these programs through a different lens and compare the data to the findings in the observation. Weekly Curriculum Based Measurements will be taken to measure each student's oral reading fluency progress. Based on tentative findings, students have progressed through CBM data. However, the progress is at a slower rate compared to the norm- referenced data within their grade levels. Teachers conveyed that when a program is implemented with the right training and students who can benefit from structure, direct instruction is found to be successful. Based on tentative findings, direct instruction reading programs are recommended for students who benefit from structure and explicit teaching skills from a young age. Students with significant disabilities are able to make progress with direct instruction, although it might be at the rate to get the students on grade level reading standards.

MOTIVATION GENERATION: AN AI'S STRENGTH AND STUDENT ENGAGEMENT IN THE ALTERNATIVE-SETTING SCIENCE CLASSROOM

Presenter(s): Scotkovsky, Matthew, Graduate, Teaching and Learning

Mentor: Dr. Meghan A. Kessler

Artificial intelligence (AI) is a technology that continues to become increasingly more prevalent, for better or worse, in the classroom. One such way that it has seen use in the classroom is in the generation of lesson plans by teachers who use AI-driven large language models (LLMs) such as OpenAI's ChatGPT and Google's Gemini. In order to see if these LLMs are, or could be, a reliable way to craft lessons as the technology continues to improve, the purpose of this study is to determine if a correlation exists between the strength of these different LLMs (measured in "parameters") and the levels of student engagement reported by students who engage in the lessons generated by these LLMs. The participants involved in this study were ten students across two classrooms in an alternative-setting high school located in a suburban town in Illinois. This data was then collected by having four different AI-driven LLMs with different numbers of parameters generate two lessons each, and by having the student participants fill out a seven-item engagement survey after each lesson, giving them a total average engagement score to report. A correlational analysis between the number of parameters of the LLMs and the engagement scores reported for the respective lessons was then run through SPSS to determine if a correlation existed between these two data sets. Findings showed that a correlation actually did not exist between the strength of an AI-driven LLM used to generate a lesson plan and the self-assessed student engagement scores reported for that lesson. This opened up conversations about student perceptions surrounding AI usage in the classroom and the digital literacy of students in the alternative-setting classroom. Should a teacher choose to integrate AI into their classroom, they may observe many differences between the lesson plans created by AI tools of varying strengths. But they should also be aware that student engagement will not be affected by these changes.

THE EFFECTS OF READING MODE ON ORAL READING FLUENCY

Presenter(s): Sharp, Matt, Graduate, Teaching and Learning

Mentor: Dr. Anna Smith

Authorship: Matt Sharp

Debate rages on regarding the efficiencies and hindrances of personal digital technology related to classroom instruction. The purpose of this study is to examine the effects of digital device-based reading compared to print-based reading on second-grade reading fluency. Specifically, how does oral reading fluency differ as the mode of independent reading periodically changes? This study is being conducted in a second-grade classroom in an elementary school in a small midwestern city. Participants are 12 second-grade students from a single classroom, reading at various independent literacy levels.

For qualitative data collection, students will complete a brief reading survey to gauge interest in, engagement with, and attitudes toward reading. This tool will be used in conjunction with periodic observations of each reader by the researcher both during and apart from the oral reading fluency assessments. Quantitative data will include: (1) Correct Words Per Minute [CWPM] read during each fluency assessment; (2) time logged reading independently within each interval, measured digitally and manually; and (3) fluency growth percentage measured between intervals (digital vs. analog) and within intervals (digital vs. digital, analog vs. analog).

Preliminary data reveals no prevailing trend regarding fluency increase or decrease, though the reading survey and initial observations show enthusiastic student readers exuding notable confidence in their abilities. As the data is collected, conclusions may be drawn between reading fluency performance, reader self-calibration, and preferences or comfort with the alternating reading media.

EXPLORING THE IMPACT OF PROJECT-BASED LEARNING ON STUDENT ENGAGEMENT

Presenter(s): Tassart, Jessie, Graduate, Teaching & Learning

Mentor: Dr. Meghan Kessler

This study explores the impact of project-based learning (PBL) on middle school students' motivation, engagement, and critical thinking skills. Many educators are unsure about using PBL because it can take a lot of time and resources. However, research shows that PBL can boost student engagement and motivation by offering real-world learning opportunities. This study uses a mixed method of research of both quantitative and qualitative data to assess the effects of PBL in a 6th-grade classroom. The classroom has a diverse group of students, including those from low-income backgrounds and students with learning disabilities. Pre and Post surveys will measure changes in student motivation and engagement while observational data will provide more insight into student engagement as well as their critical thinking. Tentative findings suggest that PBL may increase student participation, assignment completion, and mastery of skills. This research shows that, even with time and resources challenges, the benefits outweigh these and lead to greater student success.

TEACHERS ARE PEOPLE TOO: THE IMPACT OF COMMUNITY VIOLENCE ON TEACHER WELL-BEING

Presenter(s): Titus, Nate, Graduate, Teaching and Learning

Mentor: Dr. Meghan Kessler

Gun violence is an epidemic that can impact the lives of the people who work in the American public school system. There is a vast amount of research about various outside factors that contribute negatively towards student success within a public-school building, but within the parameters of professional research, the perspectives of teachers and school staff members regarding these same outside factors are sometimes disregarded. Between the high expectations from administrators, families, and society, and the other stressors that come with being a teacher, a teacher's well-being can become forgotten in the hierarchy and needs of their lives. Like anyone connected to or associated with community gun violence, teachers' lives can also be impacted. To better understand how to support teachers and other school staff members when violence occurs in their school community, this study analyzes the impact of community gun violence on the well-being of various K-8 public school staff members. Teachers and staff members at a racially, linguistically, ethnically diverse rural school district were surveyed and interviewed. The responses in both the surveys and the interviews were interpreted using an open coding method. Tentatively, school staff members shared an honest look into the mostly negative impacts of gun violence on their well-being while at school. Participants talked about being afraid or nervous to come to school, especially after a shooting or homicide had taken place the night or weekend before. Staff members shared personal anecdotes about their own experiences with gun violence or the stories that their students have shared with them. Staff members felt as though the community, police force, and local government needed to do more to protect the children being impacted by gun violence. Staff members also shared that while they may have been scared or nervous about the violence in their community, they did feel safe with the resources their school district has put in place to stop violence in the school building. There was some hesitant appreciation that the violence in the community had not spilled into the actual school buildings in the district. Based on these tentative findings, the researchers recommend schools continue putting safeguards in place to help keep violence out of our school buildings. There needs to be more support in place for when violence does happen, especially from the local government or police force. Staff members should never have to feel afraid or nervous when at work.

TEACHER PERCEPTIONS ON THE INFLUENCE OF THE BEANSTACK DIGITALREADING TRACKER IN ENHANCING STUDENT MOTIVATION FOR INDEPENDENT READING

Presenter(s): Upjohn, Carrie, Graduate, Teaching and Learning

Mentor: Dr. Meghan Kessler

Students have more options for recreational activities than ever before, which has had a negative effect on the average time spent independent reading. Following the COVID-19 pandemic, many students were quite literally addicted to screens. As a result, gamification in education has seen a significant increase over the past few years. Gaming and education have frequently been at odds, with education being seen as providing knowledge and skills and gaming seen as time wasted (Tan, 2018). Integrating gamification and game-based learning into education can help students develop intrinsic motivation to continue reading independently and create sustainable learning attitudes (Li et al., 2023). Using a digital reading tracker such as Beanstack provides may provide the flexibility of both intrinsic and extrinsic motivation for independent reading. Teachers at a diverse elementary suburban school district were surveyed, with a smaller sample opting to participate in an interview. Teachers regarded the motivation of students as positive, if extrinsic motivational factors were provided. In interviews, teachers addressed the positive correlation between their own motivation to use Beanstack and their students'. Teachers often expressed that, because the use of Beanstack for staff and students is optional and not mandatory, they simply do not have time to cover the usage within their curricular day. Based on these tentative findings, it is recommended that Beanstack remains an optional resource for both students and teachers to maintain current levels of independent reading motivation. Additional research needs to be conducted on gamification's short- and long- term effects on intrinsic and extrinsic motivation for student independent reading.

STUDENT PERCEPTIONS ON FEEDBACK

Presenter(s): Webb, Casandra, Graduate, Teaching and Learning

Mentors: Dr. Terry Husband

The problem that I am exploring involves student perception of written/verbal feedback on their writing from teachers, peers, and use of technology. Students typically thrive on feedback given that it guides their learning and highlights areas of strength. As students get older and writing style and interests change, perceptions on types of feedback also might change. Teachers are lacking appropriate time to give effective feedback, so might turn to AI tools or peer feedback to help with this process to still provide students with feedback in a reasonable amount of time. In my experiences I have seen students want to sit with me and have a verbal conference to go through their writing and provide feedback. I have also seen students respond well to digital feedback on Google Docs. Students have used peer editing in my classroom as well, and I have seen many students make the most out of this process to help their peers. On the flip side, I have also seen students who reach a point where they are "stuck" and it feels like they want me or their peers to do the writing for them, which tells me they are not needing feedback as much as some internal inspiration. My study will use an anonymous survey to collect responses from 4th grade students in a rural school. The study will consist of approximately 75-100 students and students will be asked to share their experience level with teacher, peer, and technological feedback as well as why they prefer or do not prefer that type of feedback compared to others. I am expecting to get mixed results with the type of feedback preferred by 4th grade students, but expect that the short answer section of my survey will give more insight into why students prefer teachers, peers, or technology for receiving feedback. Ultimately I hope to use this data to give teachers more information when deciding which style of feedback might be best for their own classrooms, and maybe even consider how these findings can transfer to other subject areas.

FAMILY ENGAGEMENT IN RURAL SCHOOLS: STUDY ON FAMILY ENGAGEMENT SUCCESSES AND CHALLENGES POST-COVID

Presenter(s): Weingart, Katryna, Graduate, Teaching and Learning

Mentor: Dr. Meghan Kessler

Post-covid, many educators are experiencing difficulties. Specifically, educators are struggling to support connections between school and home. Extant research on the topic of family and community engagement finds that trust is a major component within the teacher-family relationship and teachers' struggle to find time to connect with families regarding their students. However, teachers still may need support maintaining positive relationships with parents and caregivers. This study explores teachers' perceptions and experiences with family engagement using a mixed methods research approach. The quantitative data was gathered anonymously among educators within rural midwestern schools through a 30 question, Likert style survey. The qualitative data was gathered through focus group interviews. Surveys and interviews were analyzed using an open coding method to find teachers' perceptions of and experiences of family engagement. At the time of this submission, data analysis had not yet begun. However, based on preliminary review, it is anticipated that teachers will report emotional and logistical challenges with caregiver/family engagement. It is recommended that teachers have more time to connect with families regarding studentsuccesses as opposed having it overlap with their preparation time.

TEACHER EFFICACY AND PERSPECTIVES ON TRAUMA-INFORMED TEACHING

Presenter(s): Weis, Theresa, Graduate, Teaching and Learning

Mentor: Dr. Meghan Kessler

Teacher efficacy in supporting students who are experiencing trauma is a critical issue that has gained increasing attention in educational research. Teachers play a pivotal role in the emotional and academic development of students, especially those affected by various forms of trauma, such as abuse, neglect, or exposure to community violence. Students who experience trauma often exhibit difficulties in regulating emotions, concentrating, and forming positive relationships, which can hinder their learning. Since teachers are often the first line of support for these students, understanding how they perceive their ability to help trauma-impacted students is crucial in improving educational outcomes for these students. This study illuminates teachers' lived experiences, beliefs, and attitudes working with students exposed to trauma in an urban, Title I high school in central Illinois. Questionnaire responses were analyzed using an open coding method to find themes among teachers' perceptions revealed in their own words. Almost unanimously, teachers feel supported and confident in their training. Teachers shared their commitment to building connected and empathetic classroom communities that foster support and understanding for all students. Relationships are overwhelmingly mentioned as what teachers believe makes a difference in the lives of students facing trauma and what nurtures their self-efficacy in the classroom. However, teachers also disclosed that burnout and their own trauma is linked to working with students who have endured trauma. These teacher narratives call attention to a bigger issue around secondary traumatic stress within education; many teachers admit that their own self-care is not prioritized and they carry home the weight of supporting the emotional needs of students. Based on these tentative findings, additional research on the most effective interventions for trauma-impacted students is essential. Additionally, it is critical that schools prioritize the emotional well-being of teachers by providing resources, training, and support that help navigate secondary traumatic stress.

EFFECTIVENESS OF ADAPTABLE, COMPUTER-BASED, MATH INTERVENTIONS ON STANDARDIZED TEST SCORES

Presenter(s): Wilson, Lydia, Graduate, Teaching and Learning

Mentor: Dr. Anna Smith

Authorship: Lydia Wilson

Multi-tiered System of Supports (MTSS) is a framework used to ensure all students are met with targeted support in the school system. Under the academic tier of MTSS, interventions can be used to help students grow in different subject areas. After the COVID-19 pandemic, students are showing different levels of learning gaps and setbacks in mathematical foundations and knowledge. A growing trend in academic interventions in mathematics is to incorporate personalized, adaptive mathematics programs to help meet students at their academic level. A random sample of students at an ethnically, racially, financially, and linguistically diverse middle school were selected to participate in this study. This study is composed of sixth, seventh, and eighth grade students. The adaptive computer-based math program used for Tier 1 support at this school is Waggle. Students have been surveyed and observed on the minutes and usage in Waggle. That time has then been compared to growth on their standardized testing, STAR, to determine if there is a correlation between time spent in the program and growth on test scores. Based on the tentative findings, there is a positive correlation between time spent in the program Waggle, and growth on the STAR test scores in mathematics. These findings show that for tier 1 students, adaptive, computer-based technologies can be connected with growth on standardized tests.

SEL AND PERCEPTION OF CHARACTER, LEARNING AND SUCCESS

Presenter(s): Zajda, Jessica, Graduate, Teaching and Learning

Mentor: Dr. Anna Smith

Authorship: Jessica Zajda

Historically education has overlooked the necessity of building students' social emotional learning skills in cooperation with their academic success. Following COVID, students severely lacked the social-emotional skills to be successful or even present at schools, as shared in Kardambikis et al. 2020 (2). The CASEL model has been used to improve these skills within students; however, schools continue to avoid buying curriculum and mandating time to hone them (Eagan 2023). In this study, I seek to gather information on how committed, repeated, and holistic SEL lessons impact students' perception of self, perception of learning, and perceptions of success. Students have been inactive recipients of education and "quick-fix remedies" to increase their achievement (Veena 2023. As students grow in their understanding of who they are as learners, as students, as individuals, and how they are successful, educators can use that information to leverage their growth and the students' enthusiasm for learning which will hopefully increase their academic success. The research will take place across one second grade classroom, a title one elementary school with 47% of the population on free or reduced lunch (Report Card). 22.3% of the school's population is Asian, 2.8 is Black, 29.5 is Hispanic, 38.7% are White, and 6.7 are two or more cultures (Report Card). Both quantitative data and qualitative data will be collected. Students and guardians will take a benchmarking survey to create a baseline of results. Students will complete reflection recordings answering questions. Based on students' responses, students will participate in follow-up interviews, to clarify and build themes of understanding of data (Efron & Ravid 2020). This allows for a more focused approach. My intent is to characterize the effects of strategically implemented, SEL curriculum. Expected results are that as students continue to receive daily, SEL, their perceptions of self, learning and success will shift to a more positive outlook. This study impacts students, because it is seeking to build their understanding of their own character, as well as confidence within themselves and build their core competencies. This study impacts educators because it will seek to factor SEL into the daily schedule in meaningful ways that connects with students and allows them to gain greater understanding academically, but also improve their life skills.

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DEPARTMENT OF ANTHROPOLOGY

Visual Anthropology Short Films

Oral Presentations (April 11, 2025)
Moulton Hall 214
Faculty mentor: Dr. Livia Stone

****

Presenters:

Tanaya Cummings

NITE OUT!

Ghali El Houmaidi

MOTIVATIONS

Apollo Johnson

RIOT -- 2024

Alex Koch

RABBIT HOLES WITH ALEX: THE FACE OF GOD

Mustafizur Rahat

REVOLUTION IN THE WIND: THE REBIRTH OF BANGLADESH

Eleanor Reft

TRANSFERS IN TRANSITION: COMMUNITY COLLEGE STUDENTS IN THEIR FIRST SEMESTER AT A 4-YEAR

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DEPARTMENT OF PHYSICS

Oral Presentations (Saturday, April 12, 2025)
Moulton Hall 309
Faculty mentors: Prof. M. Caplan, Prof. N. Christensen, Prof. A. Harris, Prof. R. Grobe, and Prof. Q. Su

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8:00-8:15
Andy Santarelli

NEW 1D MODELS OF QAUSI-STARS

8:15-8:30
Claire Campbell

ENVELOPE WINDS AS A LIMITING FACTOR ON SUPERMASSIVE BLACK HOLE FORMATION IN QUASI-STARS

8:30-8:45
Lane Nichols

QUASI-STAR MESA MODELS - REFINING BOUNDARY CONDITIONS, IMPLEMENTING ENVELOPE ACCRETION

8:45-9:00
Eyan James

INHERITED LEARNING IN NEURAL NETWORKS AND ITS APPLICATION TO QFT VACUUM STATES

9:00-9:15
Carter West

USING NEURAL NETWORKS TO SOLVE ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS

9:15-9:30
Alexander Hardaway

ANALYSIS OF MINIMA IN THE COMPLEX PARAMETER SPACE LANDSCAPE OF NEURAL NETWORKS

Break (9:30-9:45)

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DEPARTMENT OF PHYSICS

Oral Presentations
(Continued)

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9:45-10:00
James Aygun

EFFECT OF THIRD-ORDER PHASE ON THE PHOTOELECTRON MOMENTUM SPECTRUM AND IONIZATION TIME DELAY IN A HYDROGEN ATOM AND DIATOMIC MOLECULE

10:00-10:15
Samantha Sims

SCULPTED LASER PULSES ALTER THE ELECTRON DYNAMICS IN ABOVE THRESHOLD IONIZATION

10:15-10:30
Gabriel Minney

DIAGRAM GENERATION FOR SPINOR AMPLITUDE SUBROUTINES

10:30-10:45
Dany Yaacoub

UNIVERSAL DIFFUSION IN COULOMB CRYSTALS

10:45-11:00
Levi Webb

ISOLATING DIFFUSION COEFFICIENTS OF LATTICE DEFECTS IN COULOMB CRYSTALS

11:00-11:15
Nevin Smith

MOLECULAR DYNAMICS SIMULATIONS OF THE VORTEX-LATTICE INTERACTION IN NEUTRON STAR CRUSTS

11:15-11:30
Helen Parker

USING MACHINE LEARNING TECHNIQUES TO PREDICT MOLECULAR COLLISION CROSS SEC□ONS

End of 2025 University Research Symposium, Department of Physics Oral

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SCHOOL OF THEATRE, DANCE, AND FILM

Oral Presentations
Organized by Drs. Derek R. Munson, Li Zheng, Le'Mil L. Eiland

Friday, April 11, Milner Library, Room 116
3:00 - 5:30 p.m.

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Presenters:

Michelle Alexander
(Acting)

REDEFINING THEATRICAL PRACTICES FROM COLOMBIA'S INDIGENOUS

Fredrick Igwe
(Masters in Theatre Studies)

EVALUATING APPLIED THEATRE INTERVENTIONS: A CASE STUDY OF THE ASUBOA PROJECT

John Lecouris
(Film and Digital Media)

DARK WATER: THE TRANSFERENCE OF TRAUMA BY OSMOSIS

Lawrence Quashigah
(Masters in Theatre Studies)

PERFORMING THE AESTHETIC-SELF/IDENTITY IN "MANODZI" MUSIC VIDEO

ALPHABETICAL BY STUDENT LAST NAME
MORNING SESSION

Presenter Last Name	Presenter First Name	Poster Number	Mentor's Department/School	Mentor
		A		
Abbs	Brandon	105	Psychology	Julie Campbell
Abdullah	Abu Habib Md	21	Biological Sciences	Viktor Kirik
Abugu	Christabel	134	Geography, Geology, and the Environment	Wondwosen Seyoum
Achammer	Ben	144	Mathematics	Sunil Chebolu
Affram	Kweku Amaning	38	Chemistry	Shawn Hitchcock
Aguado	Danielle	15	Biological Sciences	Tom Hammond
Alende	Joy	39	Chemistry	Andy Mitchell
Anani	Janet Laadi	59	Communication	Pete Smudde
Anderson	Madelynn	43	Chemistry	Christopher Mulligan
Anderson	Peyton	106	Psychology	Kelly Clemens
Angelo	Braden	125	Criminal Justice Sciences	Jessie Krienert
Anggriawan	Robby	169	Teaching and Learning	Sarah Reid
Asare	Nana Yaa	60	Communication	Pete Smudde
Asirifi	Mark Ofosu	53	Communication	John Baldwin

ALPHABETICAL BY STUDENT LAST NAME
MORNING SESSION

A - B				
Atias	Ariel	156	Kinesiology & Recreation	Michael Torry
Awe	'Tope	33	Biological Sciences	Andrés Vidal-Gadea
Awuku	Joseph	131	Geography, Geology, and the Environment	Eric Peterson
Baruah	Padmanav	13	Biological Sciences	Fernanda G. Duque
Bat-Ireedui	Munkhjin	109	Psychology	Dan Ispas
Bat-Ireedui	Munkhjin	116	Psychology	Seren Ozkum
Batula	Shadiyat	19	Biological Sciences	Tom Hammond
Beckman	Kaley	71	Sociology/Anthropology	Susan Sprecher
Beitello	Emily	36	Chemistry	Jeremy Driskell
Berardi	Celeste	79	Social Work	Gloria Arroyo Sugg
Beucher	Becky	98	Social Work	Gloria Arroyo Sugg
Bianca	Sierra	104	Psychology	Brea M Banks
Blija	Anja	75	Social Work	Gloria Arroyo Sugg
Block	Mary	20	Biological Sciences	Viktor Kirik
Boafo	Emmanuel	34	Chemistry	George L. Barnes

ALPHABETICAL BY STUDENT LAST NAME
MORNING SESSION

B - C				
Bounds	Lauren	71	Sociology/Anthropology	Susan Sprecher
Bradley	Micaela	155	Kinesiology & Recreation	Liz Sattler
Breausche	Faith	35	Chemistry	Jeremy Driskell
Bredesen	Ryan	171	Technology	Stephen Mujeye
Bukowski	Geena	100	Social Work	Gloria Arroyo-Sugg
Camargo	Jesus	139	Economics	Susan Chen
Canales	Allysa	62, 63	Communication Sciences and Disorders	Antony Joseph
Carlos	Nicole	113	Psychology	Caitlin Mercier
Carrillo	Yasmin	57	Communication	Megan Hopper
Caruso	Dante	115	Psychology	Allison Nguyen
Caruso	Dante	111	Psychology	Dawn McBride
Castillo	Halie	123	Family and Consumer Sciences	Luke Russell
Chamness	Belle	142	History	Kathryn Jasper
Chaney	Kendra	157	Music	Phillip Hash
Charles	Mahika	107	Psychology	Alycia Hund

ALPHABETICAL BY STUDENT LAST NAME
MORNING SESSION

C - D				
Chaudhari	Rutvik Bharatbhai	124	Family and Consumer Sciences	Erol Sozen
Chukwudi	Daniel	133	Geography, Geology, and the Environment	Eric Peterson
Clay	Taylor	62, 63	Communication Sciences and Disorders	Antony Joseph
Colula	Sophia	67	Communication Sciences and Disorders	Shraddha Shende
Cope	Chloe	128	Criminal Justice Sciences	Jeffrey Walsh
Cortina Zanella	Marina	7	Agriculture	Iuliia Tetteh
Creek	Becca	84	Social Work	Gloria Arroyo Sugg
Cremer	Hannah	119	Psychology	Shengtian Wu
Cunningham	Derian	67	Communication Sciences and Disorders	Shraddha Shende
Curry	Nadia	96	Social Work	Gloria Arroyo Sugg
Davey	Katherine	45	Nursing	Marilyn A. Prasun
Delorto	Hannah	61	Communication	Lindsey Thomas
Dhamers	Jasmine	148	Information Technology	Yousra Javed
DiSalvo	Abbey	151	Kinesiology & Recreation	Chelsea Kuehner-Boyer
Donnelly	Caitlyn	126	Criminal Justice Sciences	Jessie Krienert
Dow	Michael	110	Psychology	Dawn McBride

ALPHABETICAL BY STUDENT LAST NAME
MORNING SESSION

D - F				
Draper	Olivia	20	Biological Sciences	Viktor Kirik
Drew	Emily	50	Health Sciences	Alicia Wodika
Dunaway	Annabelle	32	Biological Sciences	Andrés Vidal-Gadea
Eagleton	Trevor	147	Information Technology	Daniel Freburg
English	Maddy	107	Psychology	Alycia Hund
Ervin	Quentin	40	Chemistry	Andy Mitchell
Estes	Destiny	123	Family and Consumer Sciences	Luke Russell
Eze	Stella	97	Social Work	Gloria Arroyo Sugg
Farmer	Emily	107	Psychology	Alycia Hund
Ferzacca	Olivia	62	Communication Sciences and Disorders	Antony Joseph
Ferzacca	Olivia	63	Communication Sciences and Disorders	Antony Joseph
Flaig	Wendell	71, 72	Sociology/Anthropology	Susan Sprecher
Flint	Arielle	104	Psychology	Brea M Banks
Flores	Peter	147	Information Technology	Daniel Freburg
Folk	Rainah	70	Sociology/Anthropology	Aaron Pitluck
Foltz	Ellanore	55	Communication	John Baldwin

ALPHABETICAL BY STUDENT LAST NAME
MORNING SESSION

F - G				
Ford	Paris	71	Sociology/Anthropology	Susan Sprecher
Fox	Cylas	166	Art	Melissa Johnson
Fox	Erika	99	Social Work	Gloria Arroyo-Sugg
Fulton	Anne	80	Social Work	Gloria Arroyo Sugg
Galvan	Pedro	28	Biological Sciences	Wolfgang Stein
Garner	Sierra	111	Psychology	Dawn McBride
George	Kali	94	Social Work	Gloria Arroyo Sugg
Gomez	Lylia	144	Mathematics	Sunil Chebolu
Gonzalez	Anya	113	Psychology	Caitlin Mercier
Gorsage	Abbie	52	Health Sciences	Liangcheng Yang
Gostu	Manideep Guptha	149	Information Technology	Will Lewis
Graci	Sarah	81	Social Work	Gloria Arroyo Sugg
Grant	Conner	2	Agriculture	Maria Boerngen
Grashoff	Emma	109	Psychology	Dan Ispas
Graunke Pasquel	Camila M.	93	Social Work	Gloria Arroyo Sugg

ALPHABETICAL BY STUDENT LAST NAME
MORNING SESSION

G - H				
Greenslaugh	Rebekah	Cancelled	Sociology/Anthropology	Gina Hunter
Greer	Alyssa	158	Music	Phillip Hash
Griffith	Jacey	107	Psychology	Alycia Hund
Guo	Anna	144	Mathematics	Sunil Chebolu
Gyamfi	Emmanuella Ama	58	Communication	Stephen Rahko
Harness	Meghann	90	Social Work	Gloria Arroyo Sugg
Harrison	Dino	147	Information Technology	Daniel Freburg
Hasan	Md. Mahadi	5	Agriculture	Rob Rhykerd
Hedge	Jenna	67	Communication Sciences and Disorders	Shraddha Shende
Hein	Sarah	78	Social Work	Gloria Arroyo Sugg
Herrmann	Jake	113	Psychology	Caitlin Mercier
Hickman	Sarah	95	Social Work	Gloria Arroyo Sugg
Hishinuma	Sanako	118	Psychology	Jeffrey Wagman
Holthaus	Jayden	62, 63	Communication Sciences and Disorders	Antony Joseph
Hossain	Md Didar	68	English	Kristina Lewis
Huber	Sarah	145	Mathematics	Sunil Chebolu

ALPHABETICAL BY STUDENT LAST NAME
MORNING SESSION

J - K				
Ijigade	Franklin	137	Geography, Geology, and the Environment	Wondwosen Seyoum
Ivanova	Violeta	110	Psychology	Dawn McBride
Iyiola	Hezekiah	82	Social Work	Gloria Arroyo Sugg
Jacobsen	Sarah	108	Psychology	Dan Ispas
Jacobson	Grady	10	Biological Sciences	Jan Dahl
Jasim	Sara	168	Politics and Government	Noha Shawki
Jaswal	Twinkle	146	Information Technology	Rosangela Follmann
Johnson	Karly	92	Social Work	Gloria Arroyo Sugg
Kante	Chaitantya	149	Information Technology	Will Lewis
Kantzavelos	Alexis	89	Social Work	Gloria Arroyo Sugg
Kaprak	Alex	112	Psychology	Dawn McBride
Kasalko	Jackie	120	Psychology	Shengtian Wu
Keating	Aleah	66	Communication Sciences and Disorders	Taeok Park
Kedzierzawski	Tim	15	Biological Sciences	Tom Hammond
Keeran	Laura	73	Sociology/Anthropology	Livia Stone
Kies	Clay	2	Agriculture	Maria Boerngen

ALPHABETICAL BY STUDENT LAST NAME
MORNING SESSION

K - L				
Kimm	Gabby	76	Social Work	Gloria Arroyo Sugg
Kimsey	Alexandria	38	Chemistry	Shawn Hitchcock
King	Kristina	45	Nursing	Marilyn A. Prasun
King	Lilly	22	Biological Sciences	Ryan Paitz
Kirchner	Wade	143	History	Amy Wood
Klann	Makenna	17	Biological Sciences	Tom Hammond
Koeller	Hattie	1	Agriculture	Maria Boerngen
Koester	Madison	71	Sociology/Anthropology	Susan Sprecher
Koritala	Mounika Navarathnam	149	Information Technology	Will Lewis
Krupa Hirenkumar	Krupa Hirenkumar	149	Information Technology	Will Lewis
Kuo	Yu Chen	161	Creative Technologies	Kristin Carlson
Kupferschmid	Megan	45	Nursing	Marilyn A. Prasun
Larsen	Abigayle	64, 65	Communication Sciences and Disorders	Antony Joseph
Lartey	Hannah	135	Geography, Geology, and the Environment	Wondwosen Seyoum
Latella	Mollie	102	Social Work	Gloria Sugg

ALPHABETICAL BY STUDENT LAST NAME
MORNING SESSION

L - M				
Laux	Sydney	71	Sociology/Anthropology	Susan Sprecher
LeClere	Abby	141	History	Kathryn Jasper
Lenoir	Shanice	85	Social Work	Gloria Arroyo Sugg
Little	Alex	116	Psychology	Seren Ozkum
Little	Alex	71	Sociology/Anthropology	Susan Sprecher
Long	Brenna	26	Biological Sciences	Ben Sadd
Lubna	Tuba Yasmin	51	Health Sciences	Liangcheng Yang
Lynn	Ashley	45	Nursing	Marilyn A. Prasun
Mahmud	Shahriar	18	Biological Sciences	Tom Hammond
Malone	Molly	2	Agriculture	Maria Boerngen
Manoj	Mukta	67	Communication Sciences and Disorders	Shraddha Shende
Massey	Kierra	91	Social Work	Gloria Arroyo Sugg
McNalis	Maggie	6	Agriculture	Jay Solomonson
Mellon	Aidan	162	Creative Technologies	Kristin Carlson
Mendoza-Rangel	Gabriela J.	16	Biological Sciences	Tom Hammond
Montalbano	Caitlin	23	Biological Sciences	Ryan Paitz

ALPHABETICAL BY STUDENT LAST NAME
MORNING SESSION

N - O				
Nalule	Sharitah	103	Psychology	Jordan Arellanes
Nelson	Ella	28	Biological Sciences	Wolfgang Stein
Nevinger	Dasha	116	Psychology	Seren Ozkum
Newsom	Jaylon	138	Geography, Geology, and the Environment	Jonathan Thayn
Nguyen	Han	150	Information Technology	Abdelmounaam Rezgui
Nielsen	Bekah	86	Social Work	Gloria Arroyo Sugg
Nlombo	Divine	48	Health Sciences	John Matkovic
Nyamekye	James	154	Kinesiology & Recreation	Tracy Mainieri
Obi	Christabel	132	Nursing	Eric Peterson
O'Dell	Kennedy	107	Psychology	Alycia Hund
O'Dowd	Sara	167	Philosophy	Cassie Herbert
Ogurek	Bella	49	Health Sciences	Jennifer Peterson
Oku	Emmanuella	163	Creative Technologies	Kristin Carlson
Oluborode	Joseph	41	Chemistry	Andy Mitchell
Olutomiwa	Fikayo	164	Creative Technologies	Annie Sungkajun
Oros	Ashley	71	Sociology/Anthropology	Susan Sprecher

ALPHABETICAL BY STUDENT LAST NAME
MORNING SESSION

P - R				
Paeth	Mollie	14	Biological Sciences	Tom Hammond
Parmentier	Taylor	153	Kinesiology & Recreation	Marcel Lopes dos Santos
Patel	Viraj	170	Teaching and Learning	Anna Smith
Paulikas	Paulina	14	Biological Sciences	Tom Hammond
Putterlik	Calvin	71	Sociology/Anthropology	Susan Sprecher
Qasrawi	Loiy	160	Creative Technologies	Greg Corness
Qasrawi	Loiy	159	Creative Technologies	Kristin Carlson
Ramos	Britney	105	Psychology	Julie Campbell
Rappe	Cole	2	Agriculture	Maria Boerngen
Rappleyea	Megan	45	Nursing	Marilyn A. Prasun
Reyes	Mary Grace	47	Nursing	Marilyn Prasun
Reynolds	Delaney	50	Health Sciences	Alicia Wodika
Riley	Jasmine	50	Health Sciences	Alicia Wodika
Rimney	Allison	14	Biological Sciences	Tom Hammond
Robson	Ethan	2	Agriculture	Maria Boerngen

ALPHABETICAL BY STUDENT LAST NAME
MORNING SESSION

R - S				
Rollins	Jacob	9	Biological Sciences	Rachel Bowden
Romps	Sydney	12	Biological Sciences	Javier delBarco-Trillo
Roque	Rav	45	Nursing	Marilyn A. Prasun
Rossi	Gabrielle	46	Nursing	Marilyn Prasun
Sadiku	Feyipitan	87	Social Work	Gloria Arroyo Sugg
Sands	Julia	14	Biological Sciences	Tom Hammond
Sapp	Madi	115	Psychology	Allison Nguyen
Schinzler	Rachel	24	Biological Sciences	Carlos Rodríguez-Saltos
Schuur	Kylie	107	Psychology	Alycia Hund
Schwarzentraub	Cassie	71	Sociology/Anthropology	Susan Sprecher
Senu	Getrude	54	Communication	John Baldwin
Shields	Kathleen	119	Psychology	Shengtian Wu
Shields	Kathleen	120	Psychology	Shengtian Wu
Shukla	Krupa Niranjanbhai	173	Technology	Sally Xie
Simons	Maili	172	Technology	Sally Xie
Sloan	Mia	44	Chemistry	Lisa Szczepura

ALPHABETICAL BY STUDENT LAST NAME
MORNING SESSION

S - T				
Smith	Sierra	123	Family and Consumer Sciences	Luke Russell
Spena	Abigail	28	Biological Sciences	Wolfgang Stein
Spranger	Kinlee	71	Sociology/Anthropology	Susan Sprecher
Spriggs	Alexandra	15	Biological Sciences	Tom Hammond
Steiger	Charlotte	29	Biological Sciences	Wolfgang Stein
Stiverson	Whitney	3	Agriculture	Michelle Kibler
Stockmaster	Ashley	4	Agriculture	Rob Rhykerd
Sulak	Meg	123	Family and Consumer Sciences	Luke Russell
Suleiman	Zainab Onozasi	130	Geography, Geology, and the Environment	Eric Peterson
Sullivan	Laine	129	Geography, Geology, and the Environment	Alec Foster
Szwed	Sydney	25	Biological Sciences	Ben Sadd
Tate	Samantha	88	Social Work	Gloria Arroyo Sugg
Tellez	Chantal	121	Family and Consumer Sciences	Jennifer Banning
Tellez	Chantal	122	Family and Consumer Sciences	Yoon Jin Ma
Thomas	Lydia	11	Biological Sciences	Javier delBarco-Trillo
Timah	Jackline	136	Geography, Geology, and the Environment	Wondwosen Seyoum

ALPHABETICAL BY STUDENT LAST NAME
MORNING SESSION

T - W				
Timejardine	Lexi	83	Social Work	Gloria Arroyo Sugg
Timm	Michael	147	Information Technology	Daniel Freburg
Timsina	Ravi	27	Biological Sciences	Ben Sadd
Tobin	Ellana	15	Biological Sciences	Tom Hammond
Tomlinson	Abigail	165	Art	Melissa Johnson
Torres	Daisy	107	Psychology	Alycia Hund
Tovar	Zenon	108	Psychology	Dan Ispas
Tuma	Caileigh	117	Psychology	Mark Swerdlik
Turkson	Vera	56	Communication	John Baldwin
Tyler	Cory	114	Psychology	Margaret Nauta
Unalan	Alper	140	Economics	Susan Chen
Vondriska	Matthew	152	Kinesiology & Recreation	Kristen Lagally
Walis	Sara	37	Chemistry	Jon Friesen
Warren	Clinton	8	Biological Sciences	Rachel Bowden
Welsh	Caitlyn	67	Communication Sciences and Disorders	Shraddha Shende

ALPHABETICAL BY STUDENT LAST NAME
MORNING SESSION

W - Z				
Whitcomb	Molly	62, 63	Communication Sciences and Disorders	Antony Joseph
Whittington	Lily	30	Biological Sciences	Wolfgang Stein
Wier	Zander	2	Agriculture	Maria Boerngen
Wiggins	Emily	42	Chemistry	Christopher Mulligan
Wilderman	Rene	31	Biological Sciences	Andrés Vidal-Gadea
Williams	Sage	77	Social Work	Gloria Arroyo Sugg
Winans	Toby	2	Agriculture	Maria Boerngen
Wojcik	Grace	101	Social Work	Gloria Arroyo-Sugg
Woodruff	Ella	71	Sociology/Anthropology	Susan Sprecher
Yemm	Genevieve	74	Social Work	Gloria Arroyo Sugg
Youngman	Dela	71	Sociology/Anthropology	Susan Sprecher
Zimmerman	Madeline	107	Psychology	Alycia Hund
Zornow	Morgan	127	Criminal Justice Sciences	Donna Selman

ALPHABETICAL BY STUDENT LAST NAME
AFTERNOON SESSION

Presenter Last Name	Presenter First Name	Poster Number	Mentor's Department/School	Mentor
			A - B	
Achammer	Ben	40	Information Technology	Mangolika Bhattacharya
Aclibon	Shari Nicole	120	Psychology	Adena Meyers
Adam	Steven	97	Agriculture	Michelle Kibler
Adeyemo	Grace	12	Communication	Andrew Ventimiglia
Akter	Tonmoy	129	Creative Technologies	Kristin Carlson
Al Mokbil	Mohammad	86	Biological Sciences	Wolfgang Stein
Alexander	Michelle	148	Theatre and Dance	Le'Mil Eiland
Amissah	Beatrice	5	Communication	John Baldwin
Apaflo	Dorcas	20	Languages, Literatures and Cultures	Rachel Shively
Arquilla	Isabelle	116	Psychology	Dawn McBride
Ayorinde	Ayomi	80	Biological Sciences	Ryan Paitz
Bains	Gursewak	61	Chemistry	Timothy Lash
Batchelor	Paige	89	Biological Sciences	Andrés Vidal-Gadea

ALPHABETICAL BY STUDENT LAST NAME
AFTERNOON SESSION

		B - C		
Beilstein	Kathryn	16	Communication Sciences and Disorders	Shraddha Shende
Bello	Ahmed	27	Information Technology	Ahmed Bello
Beltran Sanchez	Bridgette	30	Information Technology	Elahi Javadi
Benard	Charlie	29	Information Technology	Elahe Javadi
Berger	Matthew	125	Psychology	Burak Ozkum
Bhimwal	Tanisha	88	Biological Sciences	Jan Ulrik Dahl
Black	Jayde	45	Technology	Isaac Chang
Borchardt	Ryan	67	Chemistry	Steven Peters
Bottom	Gianna	1	Criminal Justice Sciences	Ashley Farmer
Brecheisen	Leah	136	Art	Melissa Johnson
Brozenec	Rachel	63	Chemistry	Andy Mitchell
Campbell	Claire	46	Technology	Matthew Hagaman
Carlos	Nicole	119	Psychology	Caitlin Mercier
Carlson	Colby	128	Management	Yongmei Bally
Cavanagh	Grace	16	Communication Sciences and Disorders	Shraddha Shende

ALPHABETICAL BY STUDENT LAST NAME
AFTERNOON SESSION

		C - D		
Chaidez	Lizbeth	98	Agriculture	Michelle Kibler
Charles	Michael	117	Psychology	Dawn McBride
Churchey	Jenna	15	Communication Sciences and Disorders	Taeok Park
Clark	Alex	43	Technology	Isaac Chang
Coomans	Jack	43	Technology	Isaac Chang
Cordray	Brooke	25	History	Kathryn Jasper
Cousin	Jaden	134	Creative Technologies	Jody Decremer
Czirjak	Annie	140	Special Education	Christy Borders
Dalbey	Nikki	19	Languages, Literatures and Cultures	Sandra Keller
Damkoehler	Kole	76	Biological Sciences	Tom Hammond
Darne	Harish	44	Technology	Isaac Chang
Das	Daya	49	Technology	Jin Jo
Davis	Alexander	76	Biological Sciences	Tom Hammond
Davis	Jordan	31	Information Technology	Elahe Javadi

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AFTERNOON SESSION

		D - F		
DeGeare	Nolan	32	Information Technology	Elahe Javadi
Delfino	Josh	49	Technology	Jin Jo
Deslaurier	Nolan	45	Technology	Isaac Chang
Donnelly	Caitlyn	113	Psychology	Laura Finan
Drew	Emily	79	Biological Sciences	Ryan Paitz
Ebubechukwu	Tricia	143	Sociology/Anthropology	Winfred Avogo
Edema	Clementina	7	Communication	Caleb Carr
Eifert	Rex	64	Chemistry	Andy Mitchell
Ekeiwu	Marycynthia	51	Technology	Pranshoo Solanki
Enevold	Alyssa	74	Biological Sciences	Fernanda Duque
Ervin	Will	121	Psychology	Allison Nguyen
Etheridge	Emma	110	Psychology	Jordan Arellanes
Everly	Jaclyn	77	Biological Sciences	Steven Juliano
Fazyl	Adina	89	Biological Sciences	Andrés Vidal-Gadea

ALPHABETICAL BY STUDENT LAST NAME
AFTERNOON SESSION

		F - G		
Fazyl	Adina	90	Biological Sciences	Andrés Vidal-Gadea
Fletcher	Kelly	122	Psychology	Allison Nguyen
Foster	Cayden	54	Chemistry	Susil Baral
Fransen	Hope	90	Biological Sciences	Andrés Vidal-Gadea
Fried	Amalie	26	History	Kathryn Jasper
Fritz	Sylvia	73	Biological Sciences	Javier delBarco-Trillo
Gautam	Binod	54	Chemistry	Susil Baral
Gautam	Liza	85	Biological Sciences	John Sedbrook
Geyer	Tara	83	Biological Sciences	Carlos Rodriguez-Saltos
Gogoi	Meghna	145	Sociology/Anthropology	Marion Willetts
Gomez	Lylia	95	Physics	Epaminondas Rosa
Gomez	Margarita	91	Biological Sciences	Andres Vidal-Gadea
Gonzalez	Grace	58	Chemistry	Jun-Hyun Kim
Guthrie	Alison	127	Psychology	Jeffrey Wagman

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AFTERNOON SESSION

		G - J		
Guzman	Jasmine	146	Teaching and Learning	Miranda Lin
Hernandez	Alexandria	122, 123, 124	Psychology	Allison Nguyen
Hiclin	Gavin	49	Technology	Jin Jo
Hindman	Katie	109	Psychology	Dr. Kimberly Schneider
Homan	Grace	57	Chemistry	Mohamed Eldeeb
Hubbard	Emily	109	Psychology	Kimberly Schneider
Igwe	Fredrick	149	Theatre and Dance	Derek Munson
Islam	Jubair	130, 131	Creative Technologies	Kristin Carlson
Jacob	Aaron	24	Geography, Geology, and the Environment	Lisa Tranel
Jain	Neer	33	Information Technology	Elahe Javadi
Jodlowski	Vanessa	116	Psychology	Dawn McBride
Johanson	Hunter	34	Information Technology	Elahe Javadi
Jones	Mackenzie	92	Biological Sciences	Andres Vidal-Gadea
Jordan	Cassandra	105	Kinesiology & Recreation	David Thomas

ALPHABETICAL BY STUDENT LAST NAME
AFTERNOON SESSION

		K - M		
Kinoti	Hildah	52	Technology	Sally Xie
Kirkham	Camryn	16	Communication Sciences and Disorders	Shraddha Shende
Knowles	Marley	96	Agriculture	Nicholas Heller
Kobulnicky	Trent	56	Chemistry	Jeremy Driskell
Koeplin	Madeline	78	Biological Sciences	Pirmin Nietlisbach
Kolukula	Carmel Pavithra	41	Information Technology	Will Lewis
Krebs	Harrison	53	Nursing	Marilyn Prasun
Latko	Morgan	137	Art	Melissa Johnson
Lomelino	Tori	109	Psychology	Kimberly Schneider
Lucer	Szymon	35	Information Technology	Elahe Javadi
Mackey	Keion	100	Agriculture	Rob Rhykerd
Malagoni	Meghana	42	Information Technology	Lewis Will
Mao	Charlisa	121	Psychology	Allison Nguyen
Marcikic	Aidan	123	Psychology	Allison Nguyen

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AFTERNOON SESSION

		M		
Marinucci	Nicole	62	Chemistry	Timothy Lash
Markham	Matthew	48	Technology	Jo Jin
Mayback	Clo	141	Philosophy	Daniel Breyer
Mccaslen	Aiden	36	Information Technology	Elahe Javadi
McCue	Brady	37	Information Technology	Elahe Javadi
McDaniel	Sean	113	Psychology	Laura Finan
McElmury	Kailey	115	Psychology	Suejung Han
Mears	Joe	49	Technology	Jin Jo
Melgoza	Briana	68	Chemistry	Lisa Szczepura
Merkling	Matt	7	Communication	Caleb Carr
Milligan	Garrett	59	Chemistry	Jun-Hyun Kim
Minney	Gabe	94	Physics	Neil Christensen
Mueller	Kate	11	Communication	Lindsey Thomas
Murphy	Tess	138	Art	Melissa Johnson

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AFTERNOON SESSION

		M - O		
Murray	Taylor	9	Communication	Cheri Simonds
Navickas	Tommy	50	Technology	Jin Jo
Neequaye	Ishmael	18	English	Kristina Lewis
Nguyen	Han	2	Communication	Shanna Carlson
Nguyen	Han	28	Information Technology	Yousra Javed
Niftulaeva	Alina	7	Communication	Caleb Carr
Niha	Shifat	90	Biological Sciences	Andrés Vidal-Gadea
Nsabaah	Joseph	65	Chemistry	Andy Mitchell
Obiri	Alfred Kwabena	6	Communication	John Baldwin
O'Connell	Ari	124	Psychology	Allison Nguyen
Okereke	Blessing	60	Chemistry	Jun-Hyun Kim
Olaya	Karen	132	Creative Technologies	Kristin Carlson
Owens	Angelina	123	Psychology	Allison Nguyen
Owusu	Emmanuel	112	Psychology	Julie Campbell

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AFTERNOON SESSION

		P - R		
Panta	Kriti	23	Geography, Geology, and the Environment	Wondwosen Seyoum
Pappoe	Deborah	3	Communication	John Baldwin
Patel	Darshita	41	Information Technology	Will Lewis
Paul	Sharanya	71	Biological Sciences	Dr. Jan Ulrik Dahl
Perhay	Alex	29	Information Technology	Elahe Javadi
Pettys	Blake	102	Kinesiology & Recreation	Samantha McDonald
Piontek	Russell	66	Chemistry	Christopher Mulligan
Prado	Ethan	139	Music	Allison Alcorn
Quick	Alexis	8	Communication	Rebecca Hayes
Rayan	South	42	Information Technology	Lewis Will
Reckamp	Robert	142	Philosophy	Daniel Breyer
Reimers	Mackenzie	4	Communication	John Baldwin
Rekart	Dylan	106	Kinesiology & Recreation	Michael Torry
Reynolds	Delaney	79	Biological Sciences	Ryan Paitz

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AFTERNOON SESSION

		R - S		
Rivera	Giselle	111	Psychology	Brea Banks
Roiland	Haley	10	Communication	Pete Smudde
Salmons	Heather	144	Sociology/Anthropology	Shelby S. J. Putt
Sander	Grant	82	Biological Sciences	Carlos Rodriguez
Schaack	Nick	Cancelled	Educational Administration & Foundations	Marci Rockey
Schunke	Ellie	21	Family and Consumer Sciences	Dr. Yoon Jin Ma
Schunke	Ellie	22	Family and Consumer Sciences	Dr.Yoon Jin Ma
Scott	Jadyn	84	Biological Sciences	Carlos Rodriguez-Saltos
Sears	Nicholas	133	Creative Technologies	Greg Corness
Semonis	Evan	103	Kinesiology & Recreation	Samantha McDonald
Seymour	Mackenzie	87	Biological Sciences	Wolfgang Stein
Shahid	Michael	57	Chemistry	Mohamed Eldeeb
Sheehan	Casey	55	Chemistry	Bhaskar Chilukuri
Sheridan	Orla	49	Technology	Jin Jo

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AFTERNOON SESSION

		S - T		
Sierra	Bianca	111	Psychology	Brea Banks
Solache	Miranda	69	Biological Sciences	Rachel Bowden
Solomon	McKenna	101	Kinesiology & Recreation	Karen Dennis
Solomon	McKenna	107	Kinesiology & Recreation	Michael Torry
Soto	Diego	104	Kinesiology & Recreation	Samantha McDonald
Soyebi	Blessing	72	Biological Sciences	Rebekka Darner
Spraggon	Meredith	114	Psychology	Laura Finan
Sribuaai	Suphasit	42	Information Technology	Lewis Will
Stanford	Kaili	135	Art	Katie Bruhn
Swinford	Rylie	47	Technology	Matthew Hagaman
Szkapiak	Sadie	118	Psychology	Dawn McBride
Tampa	Lindsey	126	Psychology	Burak Ozkum
Tay	Amanda	147	Teaching and Learning	Anna Smith
Taylor	Sean	126	Psychology	Burak Ozkum

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		T - W		
Tierney	Kathleen	99	Agriculture	Drew Lugar
Tucker	Jack	38	Information Technology	Elahe Javadi
Tunberg	Michael	133	Creative Technologies	Greg Corness
Turner	Juliana	16	Communication Sciences and Disorders	Shraddha Shende
Uppunuthula	Sankeerthan	42	Information Technology	Lewis Will
Vallepalli	Sai Lakshmi	41	Information Technology	Will Lewis
Villalobos	Samuel	133	Creative Technologies	Greg Corness
Vondriska	Matthew	101	Kinesiology & Recreation	Karen Dennis
Wanda	Devin	133	Creative Technologies	Greg Corness
Webb	Levi	93	Physics	Matt Caplan
Wertz	Jessie	81	Biological Sciences	Ryan Paitz
Wilken	Madison	70	Biological Sciences	Rachel Bowden
Williams	Sarah	109	Psychology	Kimberly Schneider
Wisdom	Lauren	101	Kinesiology & Recreation	Karen Dennis

ALPHABETICAL BY STUDENT LAST NAME
AFTERNOON SESSION

		W - Y		
Wisniewski	Marc	44	Technology	Isaac Chang
Witkowski	Daniel	39	Information Technology	Elahe Javadi
Wolfersberger	Logan	75	Biological Sciences	Fernanda Duque
Wolff	Miriam	13	Communication	Joseph Zompetti
Wright	Payton	125	Psychology	Burak Ozkum
Young	Colin	108	Kinesiology & Recreation	Michael Torry

ALPHABETICAL BY STUDENT LAST NAME
E-POSTER OPTION

Last Name	First Name	Department/School	Faculty Mentor
		A - G	
Adleman	Elise	Psychology	Daniel Lannin
Ageyi	Emmanuel	Educational Administration & Foundations	John Rugutt
Anderson	Gina	Teaching and Learning	Terry Husband
Barrios	Jerania	Psychology	Dan Lannin
Bat-Ireedui	Munkhjin	Psychology	Eric Wesselmann
Bauer	Trinity	Creative Technologies	Kristin Carlson
Beinborn	Jacob	Creative Technologies	Kristin Carlson
Benson	Jazmine	Politics and Government	Noha Shawki
Boudreau	Kendall	Teaching and Learning	Anna Smith
Bounouader	Mouna	Educational Administration & Foundations	John Rugutt
Brobston	Stacy	Special Education	Yun-Ching Chung
Bryk	Alexander	Teaching and Learning	Anna Smith
Budik	Emily	Psychology	Jeffrey Kahn
Calvillo	Melissa	Nursing	Susana Calderon
Cannon	Kara	Psychology	Dan Ispas
Cantrell	Kate	Teaching and Learning	Terry Husband
Carr	Ron	Criminal Justice Sciences	Jessie Krienert
Chlada	Anabella	Special Education	Debbie Shelden
Cintron Gonzalez	Edcel	English	Roberta Trites
Concepción Cabán	Lourdes	Psychology	Brea Banks
Dade	Quinton	Psychology	Jeffrey Kahn
DeBruyne	Brianna	Teaching and Learning	Meghan Kessler
Dinnsen	Lauren	Psychology	Shengtian Wu
Dorantes	Jeanette	Teaching and Learning	Terry Husband
Eaton- Willyard	Rachel	Teaching and Learning	Meghan Kessler
Faulhaber	Kiara	Kinesiology & Recreation	Chelsea Kuehner-Boyer
Fiedler	Kayla	Teaching and Learning	Terry Husband
Gillaspie	Jocelyn	Teaching and Learning	Terry Husband
Goins	Rochelle	Psychology	Brea Banks
Gress	Krista	Teaching and Learning	Anna Smith

ALPHABETICAL BY STUDENT LAST NAME
E-POSTER OPTION

		G - O	
Gross	Laura	Teaching and Learning	Anna Smith
Guo	Stephanie	Psychology	Shengtian Wu
Halfman	Grace Elizabeth	Teaching and Learning	Anna Smith
Hedge	Jordan	Teaching and Learning	Anna Smith
Hermann	Jake	Psychology	Daniel Lannin
Higgins Aranda	Ellen	Creative Technologies	Kristin Carlson
Hintz	Ashley	Psychology	Daniel Lannin
Hochstetler	Samantha	Teaching and Learning	Terry Husband
Holtz	Lindsey	Creative Technologies	Kristin Carlson
Igoe	Emily	Psychology	Daniel Lannin
Jegede	Kehinde	Educational Administration & Foundations	John Rugutt
Jennings	Cat	Teaching and Learning	Terry Husband
Keirn	Christy	Teaching and Learning	Terry Husband
Khan	Fawzia	Psychology	Daniel Lannin
Klein	Kelly	Teaching and Learning	Anna Smith
Kolze	Alannah	Psychology	Suejung Han
Kuhn	Rory	Psychology	Kimberly Schneider
Kunz	Marissa	Kinesiology & Recreation	Hayley Ericksen
Lafferty	Gina	Psychology	Shengtian Wu
Lamphere	Daniel	Physics	Allison Harris
Langusch	Lisa	Teaching and Learning	Terry Husband
Larson	Alivia	Kinesiology & Recreation	Hayley Ericksen
Lietz	Kaila	Kinesiology & Recreation	Chelsea Boyer
Maxwell	Zachary	Psychology	Suejung Han
Mitrega	Olivia	Teaching and Learning	Anna Smith
Mizan	Ridita	English	Angela Haas
Murray	Anthony	Creative Technologies	Kristin Carlson
Murray	Taylor	Communication	Cheri Simonds
Muzzarelli	Kristin	Teaching and Learning	Anna Smith
Narongsaksakul	Watsachol	Teaching and Learning	Ryan Brown
Narongsaksakul	Watsachol	Teaching and Learning	Ryan Brown
Narongsaksakul	Watsachol	Teaching and Learning	Ellis Hurd
O'Leary	Heather	English	Chris Breu

ALPHABETICAL BY STUDENT LAST NAME
E-POSTER OPTION

		O - Z	
O'Neill	Elizabeth	Teaching and Learning	Terry Husband
Obispo Serrano	Concepcion	Teaching and Learning	Terry Husband
Osman	Farhia	Psychology	Eric Wesselmann
Osman	Farhia	Psychology	Brea Banks
Peters	Joshua	Teaching and Learning	Meghan Kessler
Poskonka	Bryann	Teaching and Learning	Anna Smith
Rajput	Shahab Anas	Creative Technologies	Kristin Carlson
Rand	Stuart	Psychology	Eric Wesselmann
Rand	Stuart	Psychology	Gregory Braswell
Rogers	Lauren	Psychology	Dan Lannin
Sarno	Rachel	Teaching and Learning	Terry Husband
Scotkovsky	Matthew	Teaching and Learning	Meghan Kessler
Seelinger	Katharine	Creative Technologies	Kristin Carlson
Sharp	Matt	Teaching and Learning	Anna Smith
Sizemore	Morgan	Psychology	Shengtian Wu
Smith	Emma	Agriculture	Maria Boerngen
Sooby	Matthew	Psychology	Daniel Lannin
Tassart	Jessie-Rae	Teaching and Learning	Meghan Kessler
Titus	Nate	Teaching and Learning	Meghan Kessler
Toney	Taylor	Psychology	Shengtian Wu
Ugalde-Rivero	Ariadna	Psychology	Jordan Arellanes
Upjohn	Carrie	Teaching and Learning	Meghan Kessler
Walis	Emma	Psychology	Jeffrey Kahn
Walker	Anna	Psychology	Jeffrey Kahn
Webb	Casandra	Teaching and Learning	Terry Husband
Weingart	Katryna	Teaching and Learning	Meghan Kessler
Weis	Theresa	Teaching and Learning	Meghan Kessler
Whitehead	Kayden	Psychology	Shengtian Wu
Williams	Sarah	Psychology	Kimberly Schneider
Wilson	Lydia	Teaching and Learning	Anna Smith
Zajda	Jessica	Teaching and Learning	Anna Smith

ALPHABETICAL BY STUDENT LAST NAME

ORAL PRESENTERS

Last Name	First Name	Department/School	Faculty Mentor
	PHYSICS		
Aygun	James	Physics	Allison Harris
Campbell	Claire	Physics	Matt Caplan
Gabriel	Minney	Physics	Neil Christensen
Hardaway	Alexander	Physics	R. Grobe and Q. Su
James	Eyan	Physics	R. Grobe and Q. Su
Nichols	Lane	Physics	Matt Caplan
Parker	Helen	Physics	Allison Harris
Santarelli	Andy	Physics	Matt Caplan
Sims	Samantha	Physics	Allison Harris
Smith	Nevin	Physics	Matt Caplan
Webb	Levi	Physics	Matt Caplan
West	Carter	Physics	R. Grobe and Q. Su
Yaacoub	Dany	Physics	Matt Caplan
	SOCIOLOGY/ANTHROPOLOGY		
Cummings	Tanaya	Sociology/Anthropology	Livia Stone
El Houmaidi	Ghali	Sociology/Anthropology	Livia Stone
Johnson	Apollo	Sociology/Anthropology	Livia Stone
Koch	Alexander	Sociology/Anthropology	Livia Stone
Rahat	Mustafizur	Sociology/Anthropology	Livia Stone
Reft	Eleanor	Sociology/Anthropology	Livia Stone
	THEATRE AND DANCE		
Alexander	Michelle	Theatre and Dance	Le'Mil Eiland
Igwe	Fredrick	Theatre and Dance	Derek Munson
Lecouris	Jon	Theatre and Dance	Li Zeng
Quashigah	Lawrence	Theatre and Dance	Derek Munson

Other Illinois State University Symposia

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MENNONITE COLLEGE OF NURSING VIRTUAL SCHOLARSHIP SYMPOSIUM

April 17th, 2025
3:00pm to 5:00pm
on Zoom

SCHOOL OF TEACHING AND LEARNING SYMPOSIUM

April 18th, 2025
5:30pm – 8:00pm
DeGarmo Hall 20A & Online

WOMEN'S GENDER, AND SEXUALITY STUDIES 28th ANNUAL SYMPOSIUM

April 25th, 2025
9:00am – 5:00pm
Prairie Room