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.

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.

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
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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.

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.

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.

INFORMATION TECHNOLOGY

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.

SOCIAL WORK

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.

RECLAIMING THE BODY: ADAPTATION, ADVOCACY, AND EMBODIED RESILIENCE IN THE EXPERIENCE OF ENDOMETRIOSIS

Presenter(s): Greenslaugh, Rebekah, Graduate, Sociology/Anthropology

Mentor: Dr. Gina Hunter

Endometriosis is a chronic, often painful, inflammatory condition in which tissue similar to the uterine lining grows outside the uterus. It has no known cause or cure and limited treatment options. Knowledge of endometriosis varies greatly among practitioners leading to a lack of proper care for women with the condition. This condition affects more than just physical health; it disrupts relationships with friends, family, romantic partners, as well as one's relationship with the self. Literature has shown that women with chronic pain often feel as though they have a divided sense of self, the healthy body that interacts with the world, and the sick body that is disconnected. In this thesis, I argue that the experience of endometriosis, from medical dismissal to the pursuit of self-management, not only fosters a reclamation of bodily autonomy and a strengthened sense of advocacy but also reveals a larger dynamic between chronic pain and the sense of self, as seen through diet modifications as a pain management strategy. These dietary shifts extend beyond individual food choices, influencing social engagement and self-perception, often forcing individuals to prioritize their health over societal expectations of participation and self-sacrifice. In doing so, diet modification becomes a site of resistance against the passive role traditionally ascribed to women in Western biomedicine and broader social structures, ultimately reinforcing autonomy and self-worth. This project draws upon literature about the language of pain, online chronic illness communities, and women's experiences adapting to chronic illness. Through ethnographic methods, including semi-structured qualitative interviews, I investigate how women cope with endometriosis-associated pain and how these strategies, particularly diet modification, intersect with a larger narrative of self-perception and advocacy. As the incidence of endometriosis continues to rise, this research will bring light to patient experiences and the role that diet modification plays in pain management and sense of self.

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.