

Morning Session Abstracts

AGRICULTURE

PENNYCRESS UTILIZATION IN CHICKEN FEED

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

Mentor: Dr. Nicholas Heller

Pennycress (*Thlaspi arvense*) is a winter cover crop grown in the Midwest that is rising in popularity as a cash crop used for biofuel production. After oil is pressed out of the seeds, a meal remains, which may be discarded. Incorporation of this meal into feedstuffs for livestock would be an efficient way to make the biofuel process more sustainable. Wild pennycress contains anti-nutritional factors, including glucosinolates which are sulfur-containing compounds resulting in a bitter flavor. A previous study has shown that gene-edited whole pennycress seed can be incorporated into chicken feed at certain inclusion rates with no significant changes to the health of the chickens. Building from this prior study, the present research will focus on the incorporation of domesticated pennycress meal at differing inclusion rates from hatch to market in eight weeks. Effectiveness of the diet and performance of the chickens will be assessed through metrics such as feed intake, body weight gain, feed conversion, minor blood chemistries, and organ weights. Successful integration of domesticated pennycress meal into chicken diets would utilize a waste product in a productive manner.

METHANE YIELD OF PENNYCRESS BIOMASS IS INFLUENCED BY HARVEST DATE AND CONCURRENT ALKALI PRETREATMENT AND ENSILING

Presenter(s): Lubna, Tuba Yasmin, Graduate, Agriculture

Mentor: Dr. Liangcheng Yang, Health Sciences

Co-Mentor: Dr. Rob Rhykerd

Pennycress (*Thlaspi arvense* L.) is an annual cover crop, known for its exceptional cold tolerance and high oil and protein yields. Pennycress can be integrated into a corn-soybean rotation in the U.S. However, utilization of pennycress biomass remains largely unexplored, including assessing compositional changes through its growth and organic matter digestibility. This study harvested pennycress at three growth stages, characterized the biomass for anaerobic digestion (AD), and tested the effects of concurrent alkali pretreatment and ensiling on the biomass methane yield. Results showed that the biomass harvested when the plants were undergoing senescence (“third-harvest”) had higher contents of acid detergent fiber, neutral detergent fiber, and lignin, while biomass harvested when 80–90% of pods were fully- sized (“second-harvest”) had the highest protein content. The AD experiments showed that the first-harvest biomass (90% of flowers opened) failed to produce biogas due to a drop in pH and alkalinity, the second-harvest biomass was inhibited for biogas production, and the third- harvest biomass had a methane yield of 171.80 ± 4.82 L/kg-VS. After alkali pretreatment and ensiling, a methane yield of 270.4 ± 3.10 L/kg-VS was obtained from the second-harvest biomass, representing a significant 4.5-fold increase (adjusted for the organic matter loss) relative to untreated second-harvest biomass.

TRENDS IN ILLINOIS HORTICULTURAL SALES AND OPERATIONS HAVE AFFECTED THE LOCAL SHOP OWNER

Presenter(s): Petry, Nora, Undergraduate, Agriculture

Mentor: Dr. Michelle Kibler

Retail garden centers provide products including bedding flowers, potted flowers, flowers sold in flats, seeds, sprouting plants to start a garden, accessories, and decorations to customers. Sales of bedding flowers increased in popularity from 1985 to 1998 where, "... bedding/garden plant sales were over half of the finished floriculture sales for the first time" (Miller). Horticultural sales began to decline in 2005. Smaller retailers are often less financially equipped to navigate large trends in decreased sales across the horticulture industry.

This study aims to investigate national and state-level trends in horticulture since 2009. Data was collected from the United States Department of Agriculture, National Agricultural Statistics Service from 2009 to 2019 for flats, baskets, and potted plants. Data included the number of sales measured in the dollar amount, how many units sold, and number of operations.

Results indicate both national and Illinois retail sales, number of retail stores, and units sold are declining. Nationally, the number of stores decreased by 18% while sales decreased by 44% between the study timeframes. In Illinois the number of stores selling flats, baskets, and pots decreased by 21% and sales decreased by 16%. Illinois has decreased in the number of stores and operations at a higher rate than the national level, though sales nationally fell significantly more than Illinois.

The national and state level data comparing flats, hanging baskets, and potted plants with the number of operations, total sales, and number of units sold shows a decline affecting the horticultural industry. Society is shifting away from the smaller retailer, because of trends within communities and price changes within the economy. Without the local retailer, a sense of community can be lost with less opportunities to purchase custom bouquets from local florists or have a personalized experience in the garden center. Smaller retailers give the customer the opportunity to learn one-on-one how to care for the plants, the proper tools they will need, and how to maintain the health of the plant. Smaller garden centers have pride in their business, because of their passion for horticulture and their customers. In the future shopping for potted plants, flats or hanging baskets could become more commercialized, and ordered online, lacking the personal connection local retailers convey. Larger industries can operate, with the changing trends in horticulture, but they cannot compete with a garden center's personalized experience.

References

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BIOLOGICAL SCIENCES

THE ROLE OF TRM13, TRM 18, AND TRM33 PROTEINS IN THE ARABIDOPSIS CELL MORPHOGENESIS

Presenter(s): Abdullah, Abu Habib Md, Graduate, Biological Sciences

Mentor: Dr. Viktor Kirik

Authorship: Abu Habib Md Abdullah, Mark Frye, Viktor Kirik

Despite the absence of 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 to be elucidated. It was shown to interact with a family of TRM (TONNEAU1-like Recruiter Motif) proteins that includes 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 the overexpression of TRM13, TRM18, and TRM33 proteins reduces trichome branching. The TRM13-GFP and TRM33-GFP proteins localize in the cell cortex, 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 difference in localization of TRM13 and TRM18 proteins suggests a hypothesis that these proteins may play a role in microtubule organization at these locations. To understand the molecular function of TRM13 and TRM18 proteins we are testing the function of their motifs in localization and cell shape.

THE NEMATODE *C. ELEGANS* DETECTS MAGNETIC FIELDS USING AN IRON-DEPENDENT TRANSDUCTION MECHANISM

Presenter(s): Akinosho, Aalimah, Graduate, Biological Sciences

Mentor: Dr. Andrés G. Vidal-Gadea

Authorship: Aalimah Akinosho, Temitope Awe, Andrés G. Vidal-Gadea

While many animals across taxa are known to detect and orient the magnetic field of the earth, until recently no receptor had been identified in any species. Several hypothetical mechanisms have been proposed to explain how different species may detect the earth's magnetic field. These can be summarized as: **a)** the chemical hypothesis, where light is believed to generate free radicals that can align with the earth's magnetic field and be detected by modified photoreceptors in the retina's of birds and other animals; **b)** the electric induction hypothesis, where animals moving quickly through a conductive medium like sea water experience currents induced by the earth's magnetic fields that are then detected by electric sensors; and **c)** the magnetic particle hypothesis, which proposes a functional link between iron particles and transduction channels which are able to sense the force imparted on iron particles by the earth's magnetic field.

Our lab demonstrated that the nematode *C. elegans* orients to magnetic fields using a pair of sensory neurons (the AFD neurons). However, it remains undetermined how *C. elegans* accomplish the detection of magnetic fields. My thesis project is to use behavioral, molecular, and physiological approaches to systematically test each known magnetic transduction hypothesis in order to assess how these nematodes accomplish this sensory feat. Preliminary findings indicate that nematodes rely on an iron-based mechanism for magnetic transduction.

Understanding how these tiny nematodes detect and orient to the magnetic field of the earth will shed light on one of the most enigmatic and most poorly understood sensory modalities found in the natural world.

HOW DO *T. SCRIPTA* GONADS DIFFER IN GERM CELL AND HEAT-SHOCK PROTEIN GENE EXPRESSION POST-HATCH?

Presenter(s): Aldrich, Colt, Undergraduate, Biological Sciences

Mentor: Dr. Rachel Bowden

Co-Mentor: Dr. Ryan Paitz

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

Organisms that utilize temperature-dependent sex determination (TSD) rely on the surrounding thermal conditions during embryonic development to dictate whether their bipotential gonads develop into either testes or ovaries. This process occurs during a specific window of embryonic development, when these organisms undergo distinct molecular cascades that drive differentiation as the gonads respond to temperature cues. In addition, genes related to germ cell development and heat-shock may temporarily show distinct patterns as gonads differentiate and/or respond to temperature. Yet, little is known about how these differences at the level of the gonads persist beyond sex-determination or may present as sex differences post-hatch. We utilized the red-eared slider turtle (*Trachemys scripta*), a model organism in TSD studies, to explore how genes related to gonadal sex determination, germ cell (GC) development, and heat-shock proteins (HSP) might differ in their baseline expression between testes and ovaries of hatchlings. In short, the expression of sex-specific genes in the developing gonads of *T. scripta* are induced by either warm, female-producing temperature or cool, male-producing temperature that then promote either ovarian or testis development, respectively. In addition, *T. scripta* gonads appear to increase GC-related gene expression during ovarian development relative to testis development.

Meanwhile, HSPs buffer cells from environmental stressors and tend to rapidly respond to shifts in temperature. Given these patterns, we compared the expression of one testis-promoting gene (*Dmrt1*), two ovary-promoting genes (*Foxl2*, *Cyp19*), three GC genes (*Dazl*, *Nanos1*, *Vasa*), and six HSPs (*70-5*, *70-8*, *90A*, *90AB*, *90B*, and *110*) between the ovaries and testes of hatchlings. We confirmed that *Dmrt1* expression was significantly higher in the male hatchlings than the female hatchlings, and vice versa for *Foxl2* expression, suggesting that the differences in these genes which appear during sex determination persist post-hatch. Interestingly, *Dazl* expression was expected to be higher in the female hatchlings, but no sex-specific expression was detected, whereas *Nanos1* expression was significantly higher in ovaries relative to testes. Therefore, *Nanos1* should be further studied as a regulator of gonadal development and its possible functions in the hatchling ovary. Lastly, we found no significant sex difference in the baseline expression of HSP genes, unsurprising given that post-hatch temperatures remained neutral across the post-hatch period. Our findings suggest that some embryonic differences persist while others change post-hatch. Alternatively, some differences in gene expression between ovaries and testes may not arise until after hatch.

IDENTIFICATION OF ADDITIONAL REGULATORY GENES CONTROLLING ADHESION IN VIBRIO CHOLERAE

Presenter(s): Alexander, Joseph, Undergraduate, Biological Sciences

Mentor: Dr. Kyle Floyd

Authorship: Joseph Alexander, Debajyoti Basu, Anindita Saha, Kyle A. Floyd

Vibrio cholerae is an aquatic gram-negative facultative anaerobe, and the pathogen behind the human diarrheal disease cholera. *V. cholerae* has been a persistent pathogenic partner throughout human history, and until relatively recently has been one of the leading causes of preventable deaths in wartime alongside typhus, typhoid and pneumonia. Deeper understanding of the host-pathogen interactions will lead to greater efficacy in preventative measures. *V. cholerae* environmental colonization and persistence is mediated by attachment to surfaces, and biofilm formation, driven by the type IV mannose-sensitive hemagglutinin (MSHA) pilus system. MSHA pilus production is controlled by a pair of genetic operons (msh-I and msh-II), which are predicted to be regulated by three differential promoters (msh-I: P1/P2, and msh-II: P3). Previously, our lab identified the transcriptional regulatory protein FadR as a positive regulator of msh-I operon expression. Computational analysis revealed that only the msh-I P2 promoter contains a consensus binding sequence for the FadR protein, and analysis of msh promoter expression utilizing a plasmid-based transcriptional reporter showed significant reduction in P2 expression upon deletion of the *fadR* gene. However, upon deletion of *fadR*, we also observed an unexpected increase in P1 promoter expression. This increase in P1 expression suggests that, despite lacking the matching consensus sequence, the FadR protein still exerts some sort of regulatory effect on the other promoters of the msh operons. My project seeks to identify these additional regulatory pathways that impact msh-I P1 promoter expression in the absence of FadR. To this end, I established a transposon mutant library in a *V. cholerae* strain lacking *fadR*, utilizing a mini-Tn10 transposable element that randomly inserts into the bacterial genome to disrupt either genetic coding regions or regulatory regions of genes. Through insertion of a reporter plasmid utilizing the P1 promoter region to drive expression of luminescence, I am able to directly quantify changes in promoter activity. From this analysis I have identified eight additional annotated genes, and one putative gene, that are potentially involved in regulating msh gene expression in conjunction with FadR. Future directions for this investigation will involve generating formal in-frame deletions of each identified gene, and quantifying alterations in function to further explore the wider regulatory aspect of FadR protein.

THE NEWLY DISCOVERED GENE RCRB IS THE MAIN DRIVER BEHIND UROPATHOGENIC ESCHERICHIA COLI'S INCREASED RESISTANCE TO HYPOCHLOROUS ACID

Presenter(s): Bennis, Mehdi, Undergraduate, Biological Sciences

Mentor: Dr. Jan-Ulrik Dahl

Authorship: Mehdi Bennis, Sadia Sultana, Jan-Ulrik Dahl

Urinary tract infections (UTIs) are among the most prominent bacterial infections affecting about 150 million people worldwide, burdening healthcare costs. 70-80% of all UTIs are caused by uropathogenic Escherichia coli (UPEC), which commonly resides harmlessly in the gut but turns into a serious pathogen upon entry in the urinary tract where they can cause significant morbidity and mortality. To establish a successful infection, UPEC needs to access the urinary tract, ascend to the bladder to colonize, and invade the bladder cells. Before colonization, however, UPEC must overcome an onslaught of the host's defense mechanisms including attacks by innate immune cells such as neutrophils. Neutrophils sense and eliminate invading pathogens by generating a toxic cocktail of antimicrobial compounds, including hypochlorous acid (HOCl). HOCl is also the active ingredient of household bleach, one of the most potent disinfectants worldwide but can be generated in the human body mainly by the heme-containing enzyme myeloperoxidase. Not surprisingly, HOCl is highly effective in killing microorganisms by interacting with several biomolecules. Recently, we discovered that UPEC is significantly more resistant to HOCl and neutrophil-mediated killing compared to other E. coli pathotypes, which appears to be mediated by the rcrABR operon, as a deletion of one its target genes, rcrB, renders UPEC significantly more susceptible to HOCl-mediated stress, however, the mechanism behind it remains unclear. In this study, we investigated (i) the impact of a rcrA deletion in rcrBdeficient cells' resistance against HOCl (ii) The role of RcrB in quenching extracellular HOCl. Our study further contributes to understanding how UPEC counters HOCl stress during phagocytosis. Consequently, this defense system sheds light on a potential novel immunotherapeutic application that uses the body's innate immune response during infections.

DECODING THE PAST: EVOLUTIONARY HISTORY OF NORTH AMERICAN DEER MOUSE POPULATIONS ON THE GULF ISLANDS

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

Mentor: Dr. Pirmin Nietlisbach

Authorship: Rachel Berg, Pirmin Nietlisbach

Anthropogenic habitat fragmentation is increasing the number of small and isolated organismal populations, and the long-term effects of these recent isolations are not well understood. Small populations are at increased risk of extinction via demographic stochasticity and inbreeding depression. It is thus essential to identify populations that have been isolated over long periods of time to use as model systems to study consequences of isolation. Geographic barriers, such as a rise in sea level, create natural population divergence. Investigating island populations may help in the discovery of long-term isolated populations to be used as model systems. We studied historic population isolation of North American Deer Mice (*Peromyscus maniculatus*) in the Gulf Islands of British Columbia, Canada. These islands were isolated after sea-level rise following the Pleistocene ice age. We hypothesized that the order and timeline of island separation, due to a rise in local sea level, effects the phylogenetic relationship of island populations, through genetic isolation. We live trapped Deer Mice on nine of the Gulf Islands, as well as in urban Vancouver. We took a tissue sample from each trapped mouse for DNA extraction. Whole genomes were sequenced with low-depth next generation sequencing techniques, with a subset sequenced at high depth. Preliminary analyses indicate strong genetic isolation between populations. Furthermore, high depth and low depth samples from the same population group together on the phylogenetic tree, thus high depth samples will be used for further downstream analysis to determine time in isolation. Understanding the phylogenetic relationship and divergence times of these populations will provide insight into the evolution of small, isolated populations and how some have persisted through time.

ARE THEY READY? IMMUNE PRIMING AGAINST EMERGING INFECTIOUS DISEASES IN BUMBLE BEES

Presenter(s): Calhoun, Austin, Graduate, Biological Sciences

Mentor: Dr. Ben Sadd

Authorship: Austin C. Calhoun, Ben M. Sadd

Selective pressures from fitness losses associated with pathogen infection have led to the evolution of diverse mechanisms that alleviate pathogen harm. Invertebrates have evolved a memory-like innate immune response, called **immune priming**, which increases individual protection upon secondary pathogen exposure. This phenomenon can offer general or specific immune protection and can also occur across generations. Investigating the natural relevance of such protective phenomena is important for species of economic and ecological concern, like bumble bees, where novel pathogen exposure represent a threat to health.

Here we explore the specificity of immune priming against emerging infectious diseases (EIDs), specifically the honey bee virus Israeli Acute Paralysis Virus (IAPV). We hypothesize that prior pathogenic experience boosts infection resistance and tolerance to secondary pathogen exposure, however, differential exposures will precipitate mismatch costs. We subjected worker bumble bees to different priming treatments, including injected low dose or heat-killed virus of IAPV, or non-infective double-stranded RNA constructs mimicking IAPV or Deformed Wing Virus (DWV). Subsequently, we quantified measures of infection tolerance (via survival assays) and resistance (via absolute pathogen loads by RT-qPCR) following a higher dose of IAPV either 2, 7 or 14 days after the priming treatment. We find no evidence for beneficial immune priming in this system. A follow up showed that this holds true independent of the secondary exposure dose, but confirmation for the priming agents activating antiviral pathways is currently being verified via transcriptomic analysis. These results are concerning for native bumble bee health as they suggest evolved immune strategies shown to be effective against bacterial pathogens are not effective in the face of viral EID threats.

STUDYING THE MECHANISMS OF MIGRAINE VISUAL AURAS IN AN INVERTEBRATE BRAIN

Presenter: Crowe, Grace, Undergraduate, Biological Sciences

Mentor: Dr. Allison Harris, Physics

Co-Mentor: Dr. Wolfgang Stein, Biological Sciences

Authorship: Grace Crowe, Allison Harris, Wolfgang Stein

Around 300 million people worldwide suffer from migraines with visual auras. Auras are thought to be part of the initiation of migraines and are caused by a wave of inactivity that spreads over the visual cortex. This 'spreading depression' (SD) is thought to be caused by a loss of potassium homeostasis in the extracellular space around cortical neurons. However, the mechanisms by which SD is initiated remain unclear. The study of SD in mammalian systems is complicated by the complexity of the cortical network, a large number of contributing factors, and limited measurement capacity for large brain areas. Invertebrate systems can overcome many of these limitations, but there are currently only a handful of studies that indicate that SD exists in invertebrates. No mechanistic studies have been performed to demonstrate that SD spreads as a wave throughout the invertebrate brain or whether it shows the hallmarks of the mammalian SD. We use the genetic techniques available in the fruit fly, *Drosophila melanogaster*, to express fluorescent markers in the fly brain that allow us to detect spreading waves of neuronal activity. Our data indicate that SD spreads across large areas of the fly brain, and that it can be reliably elicited. Our results further demonstrate that SD is not just elicited in a single location, but can originate in several different brain areas, providing novel insights into SD initiation. We are currently testing whether the spreading wave is affected by changes to the potassium homeostasis, a hallmark of mammalian SD.

EFFECTS OF EXTRA-PAIR PATERNITY ON PROVISIONING EFFORT OF MALE HOUSE WRENS (TROGLODYTES AEDON)

Presenter(s): Dart, Avery, Graduate, Biological Sciences

Mentor: Dr. Pirmin Nietlisbach

Authorship: Avery Dart, Charles Thompson, Scott Sakaluk, Pirmin Nietlisbach

Some animals form socially monogamous pair bonds in which a male and female mate and raise young together. However, individuals within a socially monogamous pair bond may still mate with other individuals; this mating is defined as extra-pair mating (EPM). Extra-pair paternity (EPP) occurs when offspring arise from EPM. In wild birds, EPM is approximated by EPP. Males benefit from EPP by siring additional offspring without any investment aside from sperm. In contrast, from a female's perspective, EPP does not inherently increase the number of offspring they produce. Females are limited by egg production and the time it takes to raise those young, regardless of the father. However, females can still benefit from EPM. When females engage in EPM they may gain fertility assurance, access to sperm from higher quality males, and access to better foraging grounds. There are also potential costs to EPM for females, including a decrease in paternal effort by their social mates if they suspect paternity threats. I am investigating how male provisioning is affected by EPP and am studying these questions in a well-established house wren system. I am recording provisioning behaviors with video cameras and determining paternity using genetic markers. Individuals are identified by the colored bands on their legs. I am testing if males with more extra-pair young in their nests reduce provisioning rates. My research seeks to understand how EPP may benefit or cost females and how it changes male behavior.

DEVELOPING IN PLANTA PROTEIN INTERACTION ASSAY

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

Mentor: Dr. Viktor Kirik

Authorship: Katelyn Draper, Mary Block, Trevor Rickerd, Viktor Kirik

Yeast-2-Hybrid (Y2H) is a common way to study protein-protein interactions in living yeast cells. Developing a Plant-2-Hybrid (P2H) assay will allow plant scientists to observe protein interactions in their native environment. Similarly to Y2H, the P2H assay, which we are developing, is using two constructs: a bait and prey. The bait construct will contain the GL2 promoter for expression in trichomes, a DNA binding domain, and a Gateway cassette, which can be switched out for any protein of choice. The prey construct will be using a Myb5 promoter, an activation domain, the Gateway construct, and a fluorescent marker. If the two proteins do interact and bind to one another, then Gal4, a DNA binding domain and VP16 activation domain will come together and activate transcription of the fluorescent reporter Histone EGFP. In order to develop this assay, a positive and negative control will be used by utilizing proteins involved in trichome development. GL3 is a transcription factor that binds to Myb23 at a domain found in the 96 terminal amino acids of GL3. Deleting these 96 amino acids allows for a reliable negative control. After this assay is performed in planta results will be confirmed with a screening for fluorescence. In addition, the FLIM-FRET microscopy, in which one fluorescent protein is able to activate another due to proximity will be used to independently confirm the validity of the P2H. With both proximity measurements attained from FLIM-FRET and a positive result from P2H, researchers will be able to make test proteins interacting in plant cells.

THE MECHANORECEPTOR PEZO-1 IS REQUIRED FOR NORMAL MUSCLE FUNCTION AND PLASTICITY IN THE STRIATED MUSCULATURE OF THE NEMATODE C. ELEGANS

Presenter(s): Fazyl, Adina, Graduate, Biological Sciences

Mentor: Prof. Andrés, Vidal-Gadea

Authorship: Adina Fazyl, Adithya Komandur, Andrés Vidal-Gadea

Muscle cells are unique in having the ability to generate the mechanical forces required to translate animals in their environment. To accomplish this, they must continuously match their anatomical and physiological structure to ever-changing internal and external demands. While much is known about how muscles alter their force-generating machinery, or how nervous systems monitor and alter whole muscle organ function, relatively little is known about how individual muscle cells detect and adapt to changes in force output demands.

Our lab identified the mechanoreceptor channel PEZO-1, an ortholog of the human PIEZO channel family, to be highly expressed in the striated musculature of the nematode *C. elegans*. We used RNA interference, mutant analysis, calcium ratiometry, and in-depth kinematics to investigate the contribution of PEZO-1 mechanoreceptors to normal muscle function under conditions requiring differential muscle outputs (i.e. swimming vs crawling). We find that loss of PEZO-1 from muscles resulted in altered muscular output and calcium kinetics. Our work suggests that cell-specific proprioceptive feedback from mechanoreceptors might contribute to the ability of individual muscle cells to modulate their output to match internally and externally driven changes.

TESTING FOR SEX DIFFERENCES IN RESPONSE TO OXIDATIVE STRESS

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

Mentor: Dr. Ryan Paitz, Biological Sciences

Authorship: Lilly King

In humans, it has been shown that when females experience stress during pregnancy, male offspring appear to be more susceptible to detrimental consequences such as reduced growth and survival. One hypothesis is that female fetuses are less vulnerable to oxidative damage that might occur during stressful events. We have previously shown paraquat, a known inducer of oxidative damage, can lead to reduced growth and survival in chicken embryos. To test whether chicken embryos exhibit sex-specific responses similar to the pattern in humans, we injected chicken eggs with paraquat and tested for sex-specific patterns of growth and survival. We will then use two different antioxidants to test whether the negative effects of paraquat can be prevented. For one antioxidant, we will use trolox, an antioxidant that is a water-soluble derivative of vitamin E. For our second antioxidant, we will also use glutathione, an endogenous antioxidant known to decrease oxidative damage. We will have four different treatments - the first treatment will consist of injecting water into chicken eggs as a control. The second group will be injected with paraquat dissolved in water. For our third group we will inject trolox into the egg along with paraquat. For our final group we will inject glutathione along with paraquat. Using a PCR test, we will analyze the sex of the embryo to decipher whether there was a difference in growth and survival related to sex. These results will inform us about a potential sex-based difference in response to oxidative stress and show us whether antioxidants prevent negative effects on growth and survival.

TESTING FOR LOSS OF SK-3-BASED SPORE KILLING AFTER DELETION OF THREE NEUROSPORA CRASSA DNA INTERVALS: V377, V382, AND V383

Presenter(s): Klann, Makenna, Undergraduate, Biological Sciences
Okleiteris, Carolina, Undergraduate, Biological Sciences
Paulikas, Paulina, Undergraduate, Biological Sciences
Mentor: Dr. Tom, Hammond
Authorship: Makenna Klann, Carolina Okleiteris, Paulina Paulikas, Tom Hammond

Neurospora crassa is a fungus that serves as a model organism for genetic research. *N. crassa* Spore killer-3 (Sk-3) is a genetic element transmitted to offspring through spore killing. Sk-3 is located on Chromosome III and it is thought to require two genes for spore killing. These two genes are the poison gene, for killing, and the antidote gene, for resistance to killing. While the Sk-3 resistance gene has been identified (*rsk*), the Sk-3 killer gene has not yet been identified. The primary goal of this study is to identify the killer gene by investigating the role of three DNA intervals, referred to as V377, V382, and V383, in spore killing. Previous studies suggest that these intervals are within a region of Chromosome III that is required for spore killing. To determine if these intervals are required for spore killing, DNA deletion vectors were constructed and used to replace intervals V377, V382, and V383 with hygromycin resistance genes in *N. crassa* Sk-3 strain RDGR170.3. Here, we present the current results of our research. These results will contribute to future studies towards identifying the Sk-3 killer gene.

INVESTIGATING SK-3-BASED SPORE KILLING THROUGH DNA DELETIONS IN NEUROSPORA CRASSA

Presenter(s): Krivograd, Sophie, Undergraduate, Biological Sciences
Lynn Madison, Undergraduate, Biological Sciences

Mentor: Dr. Tom Hammond

Authorship: Sophie Krivograd, Madison Lynn, Tom Hammond

Meiotic drive describes a process in which selfish alleles are recovered in more than half of a progeny generation. It is a type of gene drive and it has been discovered in strains of *Neurospora*, a filamentous fungus, through its spore killing mechanism. One of the most studied meiotic drive elements within *N. crassa* is Spore-killer 3 (Sk-3). Previous studies have indicated that there is a genomic region within Sk-3 that encodes resistance to spore killing and another that encodes an element that is required for spore killing. Sk-3's resistance gene, *rsk*, has been identified. However, the exact region that mediates Sk-3's spore killing mechanism is currently unknown. In a previous study, it was found that a mutation called *rfk-2^{UV}* disrupts spore killing by Sk-3. To better understand the region of Chromosome III in which *rfk-2^{UV}* is located (its exact location is unknown), we constructed deletion vectors to replace two DNA intervals (V374 and V391) with hygromycin resistance gene markers (*hph*). Transformants were crossed to produce offspring, and offspring were tested to determine if they possess the ability to kill ascospores. Our findings will contribute to future efforts to determine the molecular nature of *rfk-2^{UV}* and why this mutation disrupts the ability of Sk-3 to kill spores.

IDENTIFYING THE EFFECT OF INDIVIDUAL QUALITY ON THE PRODUCTION OF A SECOND BROOD IN HOUSE WRENS (TROGLODYTES AEDON)

Presenter(s): Leischner, Lauren, Graduate, Biological Sciences

Mentor: Dr. Pirmin Nietlisbach

Authorship: Lauren Leischner, Charles Thompson, Scott Sakaluk, Pirmin Nietlisbach

Because breeding season length and climatic conditions limit the number of offspring migratory birds can produce, some species produce two broods in a season to maximize reproductive success. However, in species such as the house wren (*Troglodytes aedon*) not all individuals produce a second brood even if they have enough time to do so. We investigated whether variation in individual quality, in addition to timing, explains some of the variation in the likelihood of producing a second brood. Long-term data indicate that females that nest early tend to be older and have an increased probability of producing a second brood. This indicates that higher quality females breed earlier. It is therefore unclear whether the production of a second brood is solely attributable to the constraints of time or also affected by female quality. To test this question, we cross-fostered eggs between earlier-nesting females (presumed high quality) and later-nesting females (presumed low quality), causing high quality females to raise hatchlings later in the season than they otherwise would, allowing us to examine the effect of quality while controlling for the effect of time using unmanipulated control nests. We also examined whether high-quality traits of age, body condition, and territory quality were associated with the production of a second brood in the long-term dataset. If quality is heritable and related to the production of a second brood, responding to selection for double brooding would require genetic changes in the population.

THE NOVEL WINTER CASH COVER CROP PENNYCRESS PROMOTES STREAM HEALTH WITH ECONOMIC BENEFIT TO PRODUCERS

Presenter(s): Meyer, Ryan, Graduate, Biological Sciences

Mentor: Dr. Bill Perry

Authorship: Ryan Meyer, Bill Perry, Nicholas Heller, Robert Rhykerd

Nutrient export from intensive row crop agriculture, particularly in the Upper Midwestern United States, negatively impacts local and downstream aquatic ecosystem structure and function. To maintain stream and river health, techniques to reduce nutrient loss must be implemented in Midwestern agriculture. Winter cover crops, e.g., cereal rye, winter oats, tillage radish, used in Illinois cover less than 10% of fields. The novel cover crop, pennycress (*Thlaspi arvense*), is one of several winter oilseed crops that may provide cool season revenue for farmers while functioning as an effective cover crop. Our goal is to understand the potential for pennycress to reduce nutrient export in tile drained fields, which are common in the agricultural Midwest. We used replicate (n=3) 0.8 ha plots comparing soil porewater nutrient reductions in pennycress and fertilized pennycress relative to fallow winter conditions for four years. Pennycress reduced soil porewater nitrate-nitrogen by 53.3% and fertilized pennycress by 33.8% relative to fallow reference conditions. In the pennycress treatment, nitrate-nitrogen concentrations fell from 14.0 mg/L (15.1 mg/L in fertilized pennycress) in March to 1.4 mg/L (6.1 mg/L in fertilized pennycress) in June, showing an improved ability to sequester nutrients over the course of the growing season. We demonstrate that pennycress has significant potential to reduce nutrient loss from commercial agricultural systems in Illinois. However, we also found that early season establishment is crucial, and fertilization of pennycress may negatively impact the potential to reduce nutrient loss.

DELETION OF DNA INTERVALS V376 AND V389 WITHIN THE SK-3 SPORE KILLER OF NEUROSPORA CRASSA

Presenter(s): Munn, John, Undergraduate, Biological Sciences
Galvan, Pedro, Undergraduate, Biological Sciences
Mentor: Dr. Tom Hammond, Biological Sciences
Authorship: John Munn, Pedro Galvan, and Tom Hammond

In *Neurospora* fungi, the ascospores formed during reproduction will most often be black and viable. Occasionally, these ascospores will end up inviable and will be white or yellow. The discovery of a selfish genetic element called Spore killer (Sk) in 1979 gave researchers insight into a mechanism that causes some *Neurospora* crosses to produce 4 black, viable ascospores and 4 inviable, white ascospores. In these 4:4 splits, the Spore killer genetic element causes the death of half the ascospores. There are now three known spore killers in *Neurospora*: Sk-1, Sk-2, and Sk-3. We are studying Sk-3. In an Sk-3 × Sk-3-sensitive (Sk-S) cross, the Sk-3 genes are transmitted to the four black, viable ascospores, and, through a poorly understood mechanism, the Sk-3 genes kill ascospores that fail to also inherit the Sk-3 genes. The Sk-3 genes reside on Chromosome III, but the exact location of each gene is unknown. Preliminary results suggest that a DNA interval called V350 may harbor a critical Sk-3 gene. For example, deletion of the V350 interval eliminates Sk-3 spore killing. Here, we explore the deletion of additional DNA intervals located within or near V350. Specifically, we are testing the role of DNA intervals V376 and V389 in Sk-3 spore killing. The work presented here should help determine why V350, and perhaps V376 and V389, are required for spore killing by *Neurospora* Sk-3.

SPREADING DEPRESSION IN THE NERVOUS SYSTEM OF LARVAL FRUIT FLIES

Presenter(s): Nelson, Ella, Undergraduate, Biological Sciences
Mentor: Dr. Wolfgang Stein, Biological Sciences
Co-Mentor: Dr. Allison Harris, Physics
Authorship: Ella Nelson, Grace Crowe, Wolfgang Stein, Allison Harris

Spreading depression (SD) is a slowly propagating wave of inactivity spreading across the cortex in disorders such as ischemia, stroke, and brain injury. Preceded by neuronal hyperactivity, this temporary suppression of electrical activity in large areas of the cortex can have debilitating consequences. SD is best known for causing visual auras in migraineurs that precede the headache pain. While SD 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. Recently, SD has been shown to be elicited by rapid cooling of the insect brain, including that of the fruit fly, *Drosophila melanogaster*. Here, we demonstrate that SD also occurs in the central nervous system of larval flies when cooled. We use our new assay to investigate inter-individual differences between animals by measuring at what temperature larvae experience SD, and whether larvae experience SD at the same temperature. We employ fluorescent microscopy to detect neuronal activity in the nervous system of *Drosophila* larvae. Larvae were placed on a cooling plate and the temperature was lowered from 19°C to approximately -1°C. Our data demonstrate that rapidly lowering temperature initiated SD in *Drosophila* larvae. In all cases, SD began at the posterior end and propagated anteriorly, spreading throughout the central nervous system. However, we noticed that SD was not initiated simultaneously across animals, suggesting that there are inter-individual differences. We are currently analyzing the temperatures at which SD occurs, and the percentage of animals that show SD.

IDENTIFYING THE LOCATION OF THE RFK-2 SPORE KILLER GENE ON CHROMOSOME III IN THE FILAMENTOUS FUNGUS *NEUROSPORA CRASSA*

Presenter(s): Patel, Princy, Undergraduate, Biological Sciences
Oblinger-Hammond, Dayton, Undergraduate, Biological Sciences
Mentor: Dr. Tom Hammond
Authorship: Princy Patel, Dayton Oblinger-Hammond, and Tom Hammond

Meiotic drivers are selfish genetic elements that skew their transmission in their favor. In the filamentous fungus *N. crassa* one such meiotic driver is known as Spore killer-3. In a cross between an spore killer strain (Sk-3) and a wild-type strain (Sk-sensitive) only the half of ascospores (sexual spores) that contain the spore killer genes survive while the other half are not viable. Previous studies have established that a gene called *rfk-2* (required for spore killing) is essential for spore killing activity of Sk-3. It is thought that the *rfk-2* gene is located on the left arm of Chromosome III. The aim of this study is to identify the exact location of *rfk-2* to better understand Sk-3 based spore killing. We are interested to see if deletion of two DNA intervals, referred to as V378 and V380, disrupt Sk-3-based spore killing. To test this, we used DNA replacement vectors to replace V378 and V380 with hygromycin resistance markers (*hph*) in *N. crassa* strain RDGR170.3. The successfully transformed hygromycin resistant strains were crossed with two spore killing-tester strains: RTH1623.1 and RTH1623.2. The spore sacs containing ascospores from this cross will be imaged to analyze the effects of replacement of V378 and V380 on Sk-3-based spore killing.

ACTIVATION OF THE LIVER X RECEPTOR REGULATES STEROID METABOLISM

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

Mentor: Dr. Ryan Paitz

During times of stress, humans and other vertebrates produce increased levels of glucocorticoids. Glucocorticoid exposure during pregnancy can have detrimental effects on both fetal development and the long-term ability to respond to stressors. Steroid metabolism in the placenta can regulate exposure to these maternal glucocorticoids and potentially prevent negative effects. In birds, the extra-embryonic membranes contain an enzyme, 5 β -reductase (AKR1D1), that converts corticosterone (an active glucocorticoid) to 5 β -corticosterone (an inactive glucocorticoid). The aim of this study is to test the hypothesis that activation of the Liver X Receptor (LXR) regulates AKR1D1 expression. To test this hypothesis, eggs (n=60), were divided into 3 treatment groups and dosed with a synthetic LXR ligand (T090137), a natural LXR ligand (22-R hydroxycholesterol), or an oil only control group and incubated for two days. Then eggs were sampled to collect the extra-embryonic membranes for the quantification of AKR1D1 using qPCR. The results showed that both the natural ligand and synthetic ligand induced AKR1D1 expression. From there a second experiment was completed to test whether increased AKR1D1 levels confer protection against the negative effects of corticosterone. To test this, 120 eggs were divided into three treatment groups of corticosterone only, oil only, and lastly the natural ligand (Cort22 RHC) plus corticosterone. After being dosed the embryos incubated for 14 days and after the incubation period, they were inspected for effects on growth and survival. Results show that increased levels of AKR1D1 expression did not protect from the lethal effects of corticosterone. By understanding the role of the LXR in regulating steroid metabolism, we can learn more about the ability of embryos to protect against the negative effects of glucocorticoids.

USING TRANSFORMATION VECTORS TO IDENTIFY THE LOCATION OF A SPORE KILLING GENE IN NEUROSPORA CRASSA

Presenter(s): Rohrig, Isabella G., Undergraduate, Chemistry
Jones, Layla, Undergraduate, Biological Sciences
Wilder, Bethany, Graduate, Biological Sciences

Mentor: Dr. Tom Hammond

Authorship: Layla Jones, Isabella G. Rohrig, Bethany Wilder, Tom Hammond

The genetic code, or DNA, of an organism is organized into chromosomes. Some isolates of the model filamentous fungus *Neurospora crassa* harbor a selfish genetic element called Spore killer-3 (Sk-3). While the Sk-3 genetic element has been mapped to a three million base pair interval of *N. crassa* Chromosome III, an interval that contains hundreds of protein-coding genes, it is thought that only a few genes in this interval are critical for Sk-3's selfish behavior. We have targeted two DNA intervals within Sk-3 for deletion. These intervals were chosen based on preliminary evidence that they are near or within a region that is critical for Sk-3 function. Here we present the results of the experiments we have performed to test the hypothesis that both intervals, referred to as V350 and V388, are required for Sk-3 function.

WHAT MAKES A PILUS? DETERMINING THE IMPACT OF *MSH* ON *MSHA* PILUS PRODUCTION IN *VIBRIO CHOLARAE*

Presenter(s): Saha, Anindita, Graduate, Biological Sciences

Mentor: Dr. Kyle A. Floyd

Authorship: Anindita Saha, Joseph Alexander, Debajyoti Basu, Kathleen Nguyen, Gursewak Bains, Ben Ross, Kyle A. Floyd

The aquatic bacterium, *Vibrio cholerae*, is the cause of the deadly gastrointestinal disease cholera. Each year there are ~3-5 million reported cases of cholera, resulting in ~100,000-140,000 deaths. The ability of *V. cholerae* to form multi-cellular biofilms is associated with its environmental survival and persistence. Most currently circulating pandemic strains of *V. cholerae*, attach to environmental surfaces and initiate biofilm formation using the type IV mannose-sensitive hemagglutinin (MSHA) pilus. Loss of MSHA pilus production results in attenuation of surface colonization and biofilm formation. Therefore, understanding the biogenesis and regulatory mechanisms that drive MSHA pilus production is vital to deciphering *V. cholerae* environmental survival. MSHA pili are encoded within two predicted genetic operons; *msh-I* (*mshHIJKLMNEGF*) and *msh-II* (*mshBACDOPQ*). Many of the *msh* genes are homologous to similar type IV pilus genes in *Pseudomonas aeruginosa* and *Myxococcus xanthus*, however, there are *msh* genes which show little to no homology. My goal is to investigate the uncharacterized components of the *msh* operons, and their contribution to *V. cholerae* surface attachment and biofilm formation. To this end, I have successfully generated in-frame marker-less deletions of each *msh* gene individually, along with complementation plasmids for each gene. Analysis of MSHA pilus production for each deletion and complementation strain, via hemagglutinin (HA) assay, have demonstrated that *msh* genes *mshI*, *mshJ*, *mshK*, *mshL*, *mshM*, *mshN*, *mshE*, *mshG*, *mshA*, *mshC*, *mshD*, *mshO*, and *mshP* are vital for MSHA pilus production. Deletion of genes *mshH*, *mshF*, *mshB*, and *mshQ* were observed to still support MSHA pilus production, suggesting these genes might play an accessory role in pilus assembly or function. Analysis of major pilin subunit (MshA) protein production via immunoblot, demonstrated similar MshA levels among each deletion mutant (except Δ *mshA*), suggesting that pilus components are produced but not assembled among these deletion mutants. Future studies will seek to supplement these observations using fluorescence microscopy for direct pilus visualization, and quantification of cell-surface pilus levels via flow-cytometry. Together, these studies will elucidate genes important for MSHA pilus production, with the aim of developing new strategies to reduced *V. cholerae* environmental survival and persistence.

PEPTIDE MODULATION SUSTAINS TEMPERATURE ROBUSTNESS IN PATTERN-GENERATING NEURONS

Presenter(s): Sanford, Mason, Graduate, Biological Sciences

Mentor: Dr. Wolfgang Stein

The rise in ocean temperatures and extreme weather conditions have posed significant challenges for marine wildlife, particularly for ectothermic aquatic animals that live in intercoastal areas, where they experience extreme daily to seasonal temperature fluctuations. Maintaining nervous system function in extreme temperatures is particularly critical because the nervous system controls various biological processes, including decision-making, respiration, and other vital behaviors. Recent studies have suggested that neuromodulators play a crucial role in enhancing the temperature robustness of the nervous system.

The effects of neuromodulation on temperature robustness were initially characterized in the stomatogastric nervous system of *Cancer borealis*, an Atlantic crab used for studying how neural circuits generate rhythmic behaviors via central pattern generators (CPGs). Increased temperatures cause CPG's rhythmic behaviors to fail. However, peptide neuromodulators, either released hormonally or by neurons, enable these CPGs to become more robust against extreme temperatures.

We hypothesized that neuromodulators are crucial in achieving temperature robustness in other species as well. To test this, we isolated the CPG from the projection modulatory neurons, allowing the ability to manipulate the nervous system with and without neuromodulation in *Callinectes sapidus*. We recorded CPG activity and exposed it to rising temperatures until it became arrhythmic, either with or without heating the modulatory neurons. Data indicate that rhythmic activity was maintained at higher temperatures when modulatory projection neurons were heated along with the CPG (n=14). This suggests that peptide neuromodulation supports CPG temperature robustness in *Callinectes sapidus* and that this phenomenon is not specific to one crab species.

INVESTIGATION THE EFFECT OF THE HOCL DEFENSE PROTEIN RCRB ON ANTIBIOTIC SUSCEPTIBILITY IN UROPATHOGENIC E.COLI

Presenter(s): Simpkins, Tyler, Undergraduate, Biological Sciences

Mentor: Dr. Jan-Ulrik Dahl

Urinary tract infections (UTIs) are a common infection costing billions of dollars in treatment worldwide. Uropathogenic E. coli (UPEC) are the major culprits of UTIs and specifically adapted to overcome the harsh environment of the urinary tract, which includes high osmolarity and low nutrient availability. Upon entry of the urinary tract, the pathogen will encounter attacks by members of our innate immune system. Specifically, neutrophils are recruited to the infection site aimed to kill UPEC in a process named oxidative burst. During the oxidative burst, neutrophils generate large amounts of hypochlorous acid (HOCl), a potent antimicrobial that causes significant macromolecular damage in the ingested pathogen with drastic consequences for their survival. However, UPEC has evolved strategies to combat the effects of HOCl exposure. Among these are transcriptional regulators that sense the presence of reactive chlorine species, such as HOCl, and upregulate specific HOCl defense genes. Our lab identified the gene exclusively responsible for UPECs increased HOCl resistance: *rcrB*. We started to characterize RcrB's mode of action and found that RcrB is an inner membrane protein and controls the HOCl influx into the cell. In my project, I tested whether the presence of RcrB – either in the presence or absence of HOCl- affects the uptake of commonly prescribed antibiotics. My data implies that there is a synergistic stress response in UPEC in the presence of an aminoglycoside antibiotic gentamicin and HOCl. While there is little to no synergistic effect observed with ciprofloxacin and carbenicillin. My data will help understand *rcrB*'s role in the pathogenesis of UPEC.

EXPLORING THE ROLE OF GLUTATHIONE IN MITIGATING IRON-INDUCED OXIDATIVE STRESS IN CHICKEN EMBRYO DEVELOPMENT

Presenter(s): Smiley, Brendan, Undergraduate, Biological Sciences

Mentor: Dr. Ryan Paitz

In humans, an estimated 40-60% of implanted ova may be lost before birth as the result of embryonic mortality. Embryo mortality can be a result of many factors, one of which includes iron overload. Iron is essential for various physiological functions. However, it is toxic when present in excess. We investigated the consequences of iron exposure on developing chicken (*Gallus gallus*) embryos by injecting eggs early in development with varying concentrations of iron gluconate. The results demonstrated a dose dependent response to iron, with the survival at the highest dose (500 μg) being reduced to 65% compared to 93% survival in control eggs. This indicated higher concentration injections lead to higher mortality rates. The mortality rates observed could potentially be attributed to an increase in oxidative stress induced by the iron and potentially ferroptosis. These adverse effects underscore the necessity for efficient iron regulation and oxidative stress management to prevent cellular dysfunction and death especially during embryonic development. Furthermore, we sought to investigate the potential of glutathione (GSH), an antioxidant, in mitigating iron-induced mortality in chicken embryos. We hypothesized that supplemental GSH would protect developing embryos exposed to high concentrations of iron by counteracting oxidative stress caused by labile iron during embryonic development. To test this, we injected eggs early in development with either water, iron gluconate (500 μg), iron gluconate plus GSH, or iron plus buthionine sulphoximine (BSO). BSO is an inhibitor of GSH synthesis. Therefore, we predicted that iron plus BSO would result in more embryo mortality when compared to iron alone. The results of this study show that our iron treatment only reduced survival from 93% in control eggs to 83% in the iron only treatment. There was no significant effect of GSH in improving survival rates in chicken embryos exposed to iron. Furthermore, BSO did not have a significant effect on embryo survival rate when compared to iron alone. This suggests our iron treatments only have modest effects on survival (if any) and that inhibiting GSH production does not worsen the effect of iron exposure. The results of this study indicate the need for further research into the role that iron plays in inducing mortality in embryonic development and whether embryos have GSH independent mechanisms that might protect them from iron exposure.

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

Authorship: Sydney Szwed, Ben Sadd, Scott Sakaluk

Life-history theory posits that organisms distribute limited resources amongst growth, maintenance, and reproduction. In many systems, male aggression is a key component determining access to females and hence reproductive success, whereas immunity contributes to maintenance, ensuring survival and future mating prospects. 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 into aggression and immunity, independent of their deployment, or through direct costs upon competitive engagement. This study investigates the nuances of the aggression-immunity trade-off in male field crickets, *Gryllus assimilis*, to determine, (i) whether the outcome of male-male aggressive interactions is associated with baseline immune investment, and (ii) how engaging in aggression affects future immunity. Male aggression will be quantified using established protocols and combined with immune assays spanning cellular and humoral immunity and resistance to infection. 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 (i.e., fights with rivals) will decrease immunity compared with control males, with the reduction more pronounced in dominant males. This work will provide important insights into a frequently assumed, but little studied, trade-off between aggression and immunity. An integrative assessment of this trade-off and the context for its realization will contribute to our understanding of factors maintaining variation in immunity and other key life history traits.

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

Presenter(s): Timsina, Ravi, Graduate, Biological Sciences

Mentor: Dr. Ben Sadd

Authorship: Ravi Timsina, Ben Sadd

Eusociality, the hallmarks of which include cooperative breeding, division of sterile and reproductive castes, and overlap of generations, 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 many eusocial insects suggests advantages of group living, with benefits including reduced predation risk, better resource utilization, and increased tolerance of adverse conditions. Conversely, there are costs, including an increased 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.

THE RAPID TIME-COURSE RESPONSE OF HEAT-SHOCK PROTEIN GENES IN DEVELOPING RED-EARED SLIDER EMBRYOS EXPERIENCING NATURALISTIC HEATWAVE CONDITIONS

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

Mentor: Dr. Rachel Bowden

Co-Mentor: Dr. Ryan Paitz

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

Developing oviparous ectotherms are particularly susceptible to shifts in ambient temperatures. For many turtles, bouts of sudden heat (“heatwaves”) are common in natural nests and can impact developmental outcomes depending on their timing and duration. Yet, few studies have considered the time-course response of genes involved with protecting cells and tissues against adverse thermal conditions during development. Heat-shock proteins (HSPs) are molecular chaperones that protect against adverse stimuli and are likely important in an embryo's response to heatwaves. Indeed, past data suggests that gonadal expression of several HSP genes differ between constant warm and cool conditions in red-eared slider turtle (*Trachemys scripta*) embryos. Here, we studied how quickly four HSP genes (*hsp90AA*, *90AB*, *90B*, and *110*) respond to naturalistic heatwave conditions ($31\pm 3^{\circ}\text{C}$) across multiple distinct tissues in *T. scripta* embryos, as well as how quickly their expression returns to baseline when temperatures return to pre-heatwave conditions ($26\pm 3^{\circ}\text{C}$). In addition, we investigated the potential effects of developmental stage and prior heat exposures on responsiveness by monitoring embryo-wide expression of HSP genes through the early stages of development following repeated, discontinuous heatwave exposures. These studies may provide a greater understanding of how turtle embryos rapidly respond to thermal shifts and how these responses may change throughout development.

A BEHAVIORAL ASSAY FOR CRAYFISH TO DETERMINE PREFERRED HABITAT TEMPERATURES AFTER ACCLIMATION

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

Mentor: Prof. Wolfgang Stein

Authorship: Lily Whittington, Mackenzie Seymour, Wolfgang Stein

Ambient temperature plays an important role in animal survival and their physiological functions, especially in poikilothermic animals whose internal body temperature is determined by environmental temperatures. While poikilotherms are unable to use internal mechanisms for thermoregulation, it has been hypothesized that poikilotherms who experience wide temperature ranges in their habitat use compensatory mechanisms, such as behavioral and neuronal modifications, to survive. Invasive poikilothermic species, such as the marbled crayfish (*Procambarus virginalis*), have spread globally to habitats with distinct temperature ranges, including Europe, Madagascar, and Japan. This suggests that marbled crayfish can acclimate to a wide temperature range; however, the compensatory mechanisms that may play a role in acclimation remain unknown. We aim to develop a behavioral assay to investigate how acclimation to varying temperatures affects marbled crayfish behavioral responses with the long-term goal to study neurophysiological and molecular underpinnings of acclimation. Crayfish will be acclimated to two different habitat temperatures (23 and 27°C). After acclimation, we will expose individual crayfish to a temperature gradient between 18 and 32°C in a choice assay that allows them to select their preferred ambient temperature. Temperatures will be measured along the gradients, and animal movements will be recorded on video. We will analyze animal locations in 45-minute trials. We predict that crayfish will choose an ambient temperature that corresponds to their acclimated habitat temperature.

ELEVATED DAZL EXPRESSION IS ASSOCIATED WITH WARMER INCUBATION TEMPERATURES AND ESTROGENS IN *T. SCRIPTA* EMBRYOS

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

Mentor: Dr. Rachel Bowden

Co-Mentor: Dr. Ryan Paitz

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

Primordial germ cells (PGCs) arise early in embryonic development, migrate to the gonads once they begin to develop, and ultimately give rise to oocytes or spermatogonia in many animals. For species with genetic sex determination, PGCs share sex-specific genotypic information with gonadal cells, while in species with temperature-dependent sex determination (TSD), PGCs arrive at a bipotential gonad that may still develop into a testis or an ovary. It was thought that as gonadal differentiation occurs, PGCs respond to gonad specific cues to differentiate towards oocyte or spermatogonia fates, respectively. However, recent research in the red-eared slider *Trachemys scripta* suggests that PGCs may actually respond to temperature before sex is determined, playing a more active role in sex determination. Specifically, these studies found female-producing temperatures (FPTs) tended to promote higher germ cell counts that coincided with subsequent ovary development. Here we characterize how PGCs respond to estrogens in *T. scripta* by quantifying the expression of a well conserved marker of meiosis (deleted in azoospermia-like, *Dazl*). We found higher *Dazl* expression under FPTs (31°C) than male-producing temperatures (MPTs, 26°C). We also found evidence that *Dazl* expression was induced by biologically relevant doses of estradiol prior to gonadal differentiation. These preliminary results provide insight into how PGCs may be influenced by the developmental environment before gonadal differentiation under TSD.

CHEMISTRY

DEVELOPING A MASS SPECTROMETRY-BASED METHOD FOR PROCESSING FINGERNAIL SCRAPING EVIDENCE IN FORENSIC INVESTIGATIONS

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

Mentor: Dr. Christopher C. Mulligan

Authorship: Madelynn G. Anderson, Christopher C. Mulligan

Studies have shown that electrospray ionization- mass spectrometry (ESI-MS) can be achieved by using a wooden toothpick as a medium to sample and analyze target chemicals like drugs of abuse. Here, a solvent and high voltage is directly applied for extraction and ionization. We hypothesize that such a methodology can be used to process fingernail scraping evidence to test for drugs of abuse and other contraband for forensic purposes. This work details our efforts develop this method, utilizing manicurist training models as a mock surface, placing them in contact with target species in similar processes that humans would be exposed. Processing of these samples is accomplished via an open-air ion source and mass spectral analysis. Progress to date will be presented in this poster.

BRONSTED CORRELATION OF THE O-ALKYL GROUP ON THE HYDROXIDE-DEPENDENT BREAKDOWN OF O-ALKYLATE CARBINOLAMIDES

Presenter(s): Arndt, Thomas, Graduate, Chemistry
Stewart, Sarah, Graduate, Chemistry
Park, YeJun, Graduate, Chemistry

Mentor: Dr. Richard Nagorski

Authorship: Thomas Arndt, Sarah Stewart, YeJun Park

As the number of compounds of pharmacological importance possessing O-alkylated carbinolamides continues to grow, so too does the questions surrounding their aqueous reactivity. The acid-catalyzed reactions of O-alkylated carbinolamides react at the same rate as their related carbinolamides, which has been interpreted as rapid conversion of the O-alkylated compounds into their carbinolamide derivatives. The hydroxide-dependent reactions have not been as easy to interpret. The effect of substituents on the reaction of N-(alkoxybenzyl)benzamide derivatives have not exhibited a clear trend with respect to the hydroxide-dependent reaction but the data seems best fit with σ^+ . This suggests the departure of the O-alkyl group and developing positive charge on the benzyl carbon. The one clear effect that has been observed is the rate difference between N-(ethoxybenzyl)benzamide and N-(methoxybenzyl)benzamide, with the methoxy compound reacting 6.8-fold faster than the ethoxy derivative. This poster will detail the data collected to date and the effect of varying the pK_a of the O-alkyl group on the reactivity of the O-alkyl carbinolamide. The second-order rate constants for the hydroxide-dependent breakdown of the O-alkyl carbinolamides will be plotted against the pK_a of the alcohol used to provide a Bronsted correlation of the hydroxide reaction.

RAPID, DIRECT SCREENING OF PRIORITY METAL CONTAMINANTS IN ENVIRONMENTAL SYSTEMS WITH NOVEL MASS SPECTROMETRIC METHODS

Presenter(s): Chilaka, Jonathan, Graduate, Chemistry

Mentor: Dr. Christopher C. Mulligan

Authorship: Jonathan N. Chilaka, Christopher C. Mulligan

Trace amounts of metals are relatively common in our environment, and although some metals are essential to sustain life, exposure to elevated levels of toxic metals bears health risks. Hence, there is a need to examine their presence in environmental samples. While various methods exist for sensitive and selective analysis of metal contaminants in environmental matrices, they can suffer from extensive sample preparation and cost. Complexation reaction is one of the techniques employed in metal extraction, and ambient ionization techniques have been implemented for the analysis of environmental samples in their native state while cutting down on experiment cost and increasing throughput. Here, we investigate the use of 3D-printed cone spray ionization-mass spectrometry (3D-PCSI-MS), a direct ionization technique, along with specialty reagents to allow on-demand metal profiling in soil samples. This technique enables real time complexation, extraction, filtration, and ionization of the metal species in a single vessel, minimizing the need for multi-step processing. This method was characterized by utilizing ligands, free metal ions and a high-resolution mass spectrometry, and the measurement accuracy was determined using quality control samples.

BORON MEDIATED [5+2] CYCLOADDITIONS

Presenter(s): Corrie, Seth, Graduate, Chemistry

Mentor: Dr. Andrew Mitchell

Authorship: Seth Corrie, Andrew Mitchell

The Mitchell group is interested in utilizing boron to mediate [5+2] cycloadditions. The use of a tether reduces the entropic requirements necessary for a [5+2] cycloaddition but limits the scope and utility of the reaction. One option to overcome this downside is to employ the use of a temporary tether that can be severed after the [5+2] reaction is completed. Ideally, this tether would be functionalized to allow for further modification after cleavage of the tether. Previous studies by the Mitchell group have demonstrated the capabilities of DABO ligand tethers to facilitate cycloadditions with vinyl boron species. Unfortunately, they have proven considerably more stable than initially believed, which has resulted in a tether that cannot be cleaved. New approaches to a boron-nitrogen tether are under investigation and have yielded promising results with tethers that have much greater utility than the previously studied DABO ligand tethers.

SYNTHESIS AND AQUEOUS KINETICS OF UREA DERIVATIVES OF CARBINOLAMIDES: N-(HYDROXYPHENYL)-N-PHENYL UREA DERIVATIVES

Presenter(s): Homan, Lilly, Undergraduate, Chemistry
Orunesajo, Emmanuel, Graduate, Chemistry

Mentor: Dr. Richard Nagorski

Authorship: Lilly Homan, Emmanuel Orunesajo

Our group has long been interested in the aqueous reactivity of carbinolamides and how peptidylglycine- α -amidating monooxygenase (PAM) catalyzes their breakdown. The aqueous kinetic studies have provided valuable information in how this functionality reacts, which in turn provides mechanistic information that can be used to frame studies investigating how the enzyme system catalyzes the reaction of carbinolamides. An area that has been of interest to our group for some time is the enzyme ureidoglycolate lyase, which is part of the Uric acid cycle. This enzyme catalyzes the decomposition of ureidoglycolate into glyoxylate and urea. Carbinolamides are formed from amides and aldehydes while the substrate for ureidoglycolate is an aldehyde and urea. While some reactivity similarity would be expected between these two sets of compounds, no studies on the aqueous reactivity of urea carbinolamides have been performed. We have synthesized and initiated the aqueous kinetics of N-(hydroxyphenyl)-N-phenyl urea derivatives to probe the reactivity and the mechanisms by which they react under aqueous conditions.

AMIDE ASSISTED DEAROMATIC INTRAMOLECULAR OXIDOPYRYLIUM BASED (5+2) CYCLOADDITION REACTIONS

Presenter(s): Promise, Ifeanyichukwu E., Graduate, Chemistry

Mentor: Dr. Mitchell, Andy

The ability to synthesize cycloadducts from simple molecules is continually being developed by organic chemists and it is considered as one of the most useful tools in organic synthesis. This is because there are many naturally occurring biomolecules containing intermediate ring sizes (such as the seven-membered ring) and fused ring structures (which may include bicyclic heterocycles), which synthetic chemists seek out to make with readily available starting materials. The Mitchell research group is focused on understanding various factors, limitations, and mechanisms related to the silyloxyprone alkene [5+2] cycloaddition reaction, with the use of commercially available starting materials. In general, intermolecular cycloadditions are difficult to come by, however, we successfully synthesized different cycloadducts with various amide tethers via an intramolecular [5+2] cycloaddition mechanism at moderate temperatures. Amide tethers with bulky groups, tend to lock the alkene / Indole moiety, underneath the pyrone toward an achievable cycloaddition, and in due course, we propose the ability to cleave the amide bond of these cycloadducts to assist additional promising synthetic routes.

ENHANCED STABILITY OF THIOLATED ENZYME IMMOBILIZED ON GOLD NANOPARTICLES

Presenter(s): Walder, Jason, Undergraduate, Chemistry

Mentor: Dr. Jeremy Driskell

Authorship: Jason Walder, Faith Breausche, Annelise Somerlot, Jeremy Driskell

Gold nanoparticles (AuNPs) have become a focus of scientific research as they are easily manipulated and have many applications in biotechnology. Specifically, protein-nanoparticle conjugates have several applications in fields such as drug delivery, imaging, or biosensing.

This study focuses on the effects of chemical modification of enzymes on the stability, immobilization, and enzymatic activity upon adsorption to AuNPs. Specifically, horseradish peroxidase (HRP) and its thiolated analog (THRP) are compared to deduce the impact of thiolation and immobilization on the enzyme's activity and stability. Enzymatic activity is measured through the application of UV-vis spectroscopy and an enzyme-substrate reaction with 2,2'-Azinobis [3-ethylbenzothiazoline-6-sulfonic acid]-diammonium salt (ABTS). Both temperature and time in solution are important factors related to structural changes that impact enzymatic activity. The enzyme response to these parameters is important for defining storage conditions and viability in biological application. In this work, the enzymatic activity of HRP and THRP were compared with that of AuNP-HRP and AuNP-THRP conjugates as a function of time (0 h – 1 month) and temperature (4 – 50 °C). Our results establish that chemical modification of HRP to install a thiol functional group does not impact the secondary structure or activity compared to that of native HRP. Moreover, both enzymes show a similar temperature response, in which nearly a complete loss of enzymatic activity is observed within 72 h at 50 °C and 1 month at 22 °C and 4 °C. Conversely, immobilization of the enzyme on AuNPs extended the shelf-life with THRP-AuNP conjugates maintaining approximately 80% enzymatic activity after 1 month at 4 °C. These results highlight the potential for protein modification and immobilization to substantially extend protein shelf- life and enhance biological function.

TOWARDS A COMBINED SPECTROSCOPIC/SPECTROMETRIC APPROACH FOR PROCESSING MODERN FORENSIC DRUG EVIDENCE

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

Mentor: Dr. Christopher Mulligan

Authorship: Emily Wiggins, Ebenezer Bondzie, Jamie R. Wieland, Jun-Hyun Kim, Christopher C. Mulligan

Rapid confirmation of drug contraband, either in the field or more expeditiously in the forensic laboratory setting, has the potential to streamline the front end of the forensic science process by providing time-sensitive determinations of probative value from chemical evidence. rapidly assessing the probative value of chemical evidence directly at the crime scene or policing activity. This, in turn, can provide law enforcement personnel with necessary information in a timely manner, which in many cases is crucial. However, any new methodology must meet minimum standards for generating prosecutorial information (e.g., SWGDRUG recommendations). This work examines the coupling of portable DART-MS with Raman spectroscopy from a singular sampling of emerging drug evidence types to provide such a capability.

COMMUNICATION

THE ROLE OF EMPLOYEE ADVOCACY IN PROMOTING POSITIVE CORPORATE REPUTATION: AN EXPLORATORY STUDY OF EMPLOYEES OF HIGHER EDUCATION INSTITUTIONS

Presenter(s): Anani, Janet Laadi, Graduate, Communication

Mentor: Dr. John Baldwin

Authorship: Janet Laadi Anani

Employee advocacy has drawn significant attention in reputation management research and is of great interest to communication scholars. Despite its ubiquitous nature, little is known about how employee advocacy contributes to promoting the reputation of higher education institutions. This study fills the gap by drawing on in-depth interviews to explore the motivations, strategies, and outcomes of employee advocacy in a large midwestern US university. The study showed that employees of higher education institutions promoted the reputation of the institution through word of mouth, their social media platforms, or the use of institution apparel. Additionally, pride was a key factor that drove employee advocacy, especially amongst employees who were alumni of the institution as a result of their long connection to the university. Findings highlight the dynamics of employee advocacy, which provides directions for future related studies.

WORKPLACE INTERACTION: EMPLOYEES' PERCEPTION OF MANAGERS' WILLINGNESS TO SHARE INFORMATION

Presenter(s): Edema, Clementina, Graduate, Communication

Mentor: Dr. John Baldwin

Authorship: Clementina Edema

Vertical communication plays an integral role in the running of an organization; this involves the process of information sharing between managers and employees within the same organizational structure, where the communication of information can determine the success or failure of the organization and the people working there. This study explores the dynamics of manager-employee interaction in the workplace and employees' perceptions of their managers' willingness to share work-related information with them. After a focus group discussion with eight participants across the United States, I used thematic analysis to analyze the data. The result highlights employees' positive and negative experiences when working with managers, cultural differences, and communication style as a factor in how managers interact with them.

THE TRUE REFLECTION OF BEAUTY: A THEMATIC ANALYSIS LOOKING AT GENDER REPRESENTATION IN THE BEAUTY INDUSTRY THROUGH ADVERTISEMENTS

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

Mentor: Dr. John Baldwin

Authorship: Kate Mueller

This study examines gender representation and diversity as portrayed in advertisements produced by the beauty industry. Through a thematic analysis of 25 popular film advertisements from the website Ads of the World from the past three years this study examines the beauty industry's use of gender representations and contribution to gender stereotypes. The reflection of representation in the beauty industry has been closely examined as the industry continues to strive to become more inclusive regarding race and body diversity often leaving out gender. Popular marketing tactics such as "femvertising" are examined as a way in which companies work to target specific genders. This study found through the examination of visual imaging that these popular advertisements focus on depictions of over-sexualization, natural beauty, intersectionality, strength, and power to capture gender targeted advertisements when selling beauty products.

CULTURAL COMPETENCY APPLICATION ON COLLEGE CAMPUSES

Presenter(s): Snelling, Cassandra, Graduate, Communication

Mentor: Dr. John Baldwin

Co-Mentor: Dr. Lance Lippert

As higher education institutions continue to diversify, the development of intercultural communication competence becomes part of a lifelong journey toward being more empathetic and knowledgeable of those around us. This project presents the development of a two-day retreat workshop to enhance intercultural communication skills. Teaching techniques such as case studies, group activities, self-reflection, storytelling, food sharing, and media address different student learning styles. I will apply concepts and theories to the design and assessment of their workshop. The workshop moves first-year students beyond tolerance to cultural humility and kindness towards each other's differences. The workshop will enhance the student's personal growth, translating to inclusivity, respect, collaboration, and learning in the classroom environment. From a community perspective, a cultural humility retreat contributes to minimizing stereotypes, recognizing one's biases, and appreciating other cultures.

SEX SELLS, NOT SPORTS: HOW WOMEN STUDENT-ATHLETES FUNCTION AND NAVIGATE THROUGH AN NIL CULTURE

Presenter(s): Sugimoto, Kaylee, Undergraduate, Communication

Mentor: Dr. Byron Craig

This qualitative study examined how women collegiate athletes navigate and function within a name, image, and likeness (NIL) culture through the collection of 977 comments from LSU gymnast Olivia Dunne's Instagram profile, who is the highest-paid NIL woman athlete.

Initially, 1,000 comments were collected, but 23 were eliminated due to being written in a non-English language or lacking cohesion. Data was analyzed through coding and thematic analysis. Results displayed four broad themes (attraction, sexualization, objectification, and disrespect, criticism of social media appearance, and support of career and life). Broadly, Dunne's NIL success was not built upon her skills as an athlete, but rather on her physical appearance, attractiveness, and sexual appeal. Though the study was done over a short period of time and only examined Instagram, the results hold implications for universities with athletes participating in NIL (e.g., holding workshops), NIL brand deals (e.g., creating a focus on women's athletic ability over appearance), as well as future directions for research (e.g., the mental and emotional effects NIL has on a woman student-athlete, the personal challenges women student-athletes face when navigating NIL, and how women with different intersectional identities navigate a NIL culture).

“YOU LOSE A PARENT, BUT THE PARENT IS STILL ALIVE:” COMMUNICATING AMBIGUOUS LOSS WITHIN ESTRANGEMENT

Presenter(s): Wolff, Miriam, Graduate, Communication
Murray, Taylor, Graduate, Communication
Mentor: Dr. John Baldwin
Authorship: Miriam Wolff, Taylor Murray

Family estrangement between parents and adult children is increasingly recognized as a complex phenomenon, yet remains understudied compared to its prevalence. This research examined experiences of grief and communication difficulties related to estrangement through qualitative interviews with 8 individuals (7 adult children, 1 parent), ranging from ages 18-65, who underwent emotional and/or physical distancing from a family member.

These interviews consisted of 6-10 questions and were 15-50 minutes long. A thematic analysis of interview transcripts revealed profound feelings of loss and unresolved mourning stemming from the severed parent/child relationship. Participants described sadness, nostalgia, shame, and perpetual grief over losing meaningful bonds while the estranged relative still lives. Communicating such feelings of loss with others proved challenging, with most relying on avoidance, vagueness, or humor when discussing the estrangement. Accounts additionally emphasized deficient communication as central to fueling the original relational rift and obstructing reconciliation. Overall, findings illuminate the trauma of "frozen grief" resulting from ambiguous loss in estranged families. Difficulty coping with uncertain loss appears tied to communication inhibition and lasting internal turmoil. By highlighting estrangement's connections to suppressed grief and ambiguous loss, this study expands conceptualizations of how such emotionally confusing relational ruptures damage family bonds over time. Practical implications center on the need for social support and open communication to alleviate estrangement's devastating impacts.

COMMUNICATION SCIENCES AND DISORDERS

VALUE DIRECTED STRATEGIC PROCESSING IN AGE RELATED HEARING LOSS

Presenter(s): Manoj, Mukta, Undergraduate, Communication Sciences and Disorders
Welsh, Caitlyn, Graduate, Communication Sciences and Disorders
Mentor: Dr. Shraddha Shende
Authorship: Mukta Manoj, Caitlyn Welsh, Shraddha Shende, Raksha Mudar

The increasing life expectancy of humans has emphasized the significance of sensory deficits on cognitive function in aging adults. Emerging evidence demonstrates that hearing loss in older adults is a modifiable risk factor for dementia, promoting the exploration of the connections between auditory functions and cognitive abilities. Previous research has shown that older adults with age-related hearing loss (ARHL) experience changes in various cognitive tasks, relative to older adults with no hearing loss. However, research on changes in value-directed strategic processing, a high-order cognitive function, in those with mild severity of ARHL has been relatively unexplored. This research project aims to examine if (1) value directed strategic processing is different between older adults with ARHL and older adults with normal hearing, and (2) the relationship between speech-in-noise recognition, a common problem experienced by those with ARHL, and strategic processing.

We used an in-house developed value directed strategic processing task. Data analysis included conducting one-way ANOVA to examine differences on the value-directed strategic processing task. Preliminary analysis reveals no significant group differences on value-directed strategic processing; however, trends are noticed. Correlational data was analyzed with Pearson's r . No significant correlations were observed. Additional data is currently being analyzed, which will be presented during the symposium.

CAREGIVER FEEDBACK ON EI TELETHERAPY SERVICES DURING COVID-19

Presenter(s): Olsen, Mallory, Undergraduate, Communication Sciences and Disorders

Mentor: Dr. Jamie Smith

Co-Mentor: Dr. Ciera Lorio

This study investigated the experiences of families receiving therapy services in the early intervention system during the early months of the COVID-19 pandemic. The abrupt transition to telehealth services was particularly challenging for many parents of young children, and in this internet survey, they were invited to describe both positive and negative aspects of online service provision. Analysis of their responses indicated that family outcomes were influenced by a variety of factors. Implications for providers are discussed.

GENDER DISPARITIES IN HEALTH PROFESSIONS: EXPLORING SALARY DIFFERENCES BETWEEN MALE AND FEMALE DOMINATED SPECIALTIES

Presenter(s): Parker, Sarah, Undergraduate, Communication Sciences and Disorders
Verticchio, Maggie, Undergraduate, Communication Sciences and Disorders
Clay, Taylor, Graduate, Communication Sciences and Disorders
Mast, Daniel, Graduate, Communication Sciences and Disorders
Whitcomb, Molly, Graduate, Communication Sciences and Disorders

Mentor: Dr. Antony Joseph

Authorship: Sarah Parker, Maggie Verticchio, Taylor Clay, Daniel Mast, Molly Whitcomb,
Antony Joseph

This project sought to investigate the correlation between gender and average salary across various clinical specialties, encompassing disciplines such as Audiology, Diet and Nutrition, Medical Technology, Occupational Therapy, Optometry, Pharmacy, Physical Therapy, Podiatry, Psychology, Social Worker, Speech-Language Pathology, Family Practice Medicine, Nurse Practitioner, Chiropractor, and General Dentist. Data on average salaries were collected from publicly available online sources, revealing substantial variation among specialties, with Social Workers having the lowest average salary (\$55,350) and Family Medicine Physicians the highest (\$224,460). The analysis unveiled a significant gender disparity in certain professions, with Social Work being predominantly female-dominated (81%) and Family Medicine Physicians predominantly male-dominated (61%). Specifically focusing on Audiology, a specialty largely represented by female clinicians (84%), the average salary was \$72,861, contrasting with male audiologists who earned an average of \$106,601. These findings suggest that certain health professions may exhibit lower salaries for females, particularly in fields where the majority of practitioners are women.

THE IMPACT OF STUDENT CONFERENCE REGISTRATION FOR HEALTH PROFESSIONAL MEMBER ORGANIZATION

Presenter(s): Verticchio, Maggie, Undergraduate, Communication Sciences & Disorders
Parker, Sarah, Undergraduate, Communication Sciences & Disorders
Clay, Taylor, Graduate, Communication Sciences & Disorders
Mast, Daniel, Graduate, Communication Sciences & Disorders
Whitcomb, Molly, Graduate, Communication Sciences & Disorders

Mentor: Dr. Antony Joseph

Authorship: Maggie Verticchio, Sarah Parker, Taylor Clay, Daniel Mast, Molly Whitcomb

The primary aim of this project was to compare the most recent rate for conference registration fees, using a sampling of health professional member organizations. A secondary aim was to evaluate if these organizations offered a discount for students and if that fee was correlated with median salary level. Online, publicly available sources were used to collect data on the clinical specialties including Audiology, Diet and Nutrition, Medical Technology, Occupational Therapy, Pharmacy, Physical Therapy, Social Worker, Speech- Language Pathology, Family Practice Medicine, Nurse Practitioner, Chiropractor, and General Dentist. We were unable to locate the conference registration fees for Music Therapy, Optometry, and Podiatry. When comparing the student member conference fee to the professional conference fee, we discovered that the average student fee was 40% of the professional fee. We determined that the lowest student conference fee rate was 3% (Medical Technology) and the highest was 69% (Occupational Therapy). The student fee for Audiology was 14% of the professional conference fee, which was almost one third of the average rate. Because the conference fee for Audiology students has been significantly discounted, we examined whether this has impacted student membership retention.

CRIMINAL JUSTICE SCIENCES

JUVENILE SEX OFFENSE REGISTRATION LAWS STATE-BY-STATE COMPARISON

Presenter(s): Russell, Gaby, Undergraduate, Criminal Justice Sciences

Mentor: Dr. Joanne Savage

After completing a short research paper about juvenile sex offending being largely based on adult sex offense research and policies as well as how states across the US have different requirements for juvenile sex offense registration laws, I wanted to conduct further research on the specific variances in juvenile sex offense registration laws in most states. There is not one strict national law regarding juvenile sex offense registration requirements giving states the liberty to determine how to handle juvenile sex offense registration laws, amongst other topics. Looking at over 30 states registration requirements for juvenile sex offenders allowed for some common themes to be seen. Some states have different tiers for the sentence depending on the offense. Some states allow for early termination past a certain age or dependent upon the juvenile's behavior during their sentence term, while other states do not allow for any special relief provisions for juveniles. There is also variance in states requiring juveniles to be placed on the public sex offender registration. Some allow for offenders to eventually be removed from the sex offender registration after a certain amount of time and some allow for juveniles who committed a sex offense to get this expunged from their record. While I do not have much experience doing legal research, I was able to gain more confidence in finding specific laws referenced in state-by-state comparison sites, improve my understanding of legal jargon and the loopholes associated with state laws, and build on my research skills regarding legal research as preparation for a career in law. I was also able to improve my presentation skills and gained more confidence in explaining legal research in easy-to-understand language to people.

THE IMPACT OF SEXUAL VICTIMIZATION ON BEHAVIORAL CHANGES AND ACADEMIC PERFORMANCE AMONG COLLEGE STUDENTS: A STUDY AT ILLINOIS STATE UNIVERSITY

Presenter(s): Wade, India, Graduate, Criminal Justice Sciences

Mentor: Dr. Jessie Krienert

This study investigates the impact of sexual victimization on behavioral changes and academic performance among college students at Illinois State University. Using a quantitative self-report design, data was collected through an online survey from 229 students. Results revealed significant effects of sexual victimization on behavior, including changes in college experience, social life, and personality. Victims reported feeling less safe and respected on campus compared to non-victims. Additionally, victims experienced negative effects on academic performance, with a decline in GPA. Findings underscore the need for comprehensive support systems and prevention efforts within university settings to address sexual violence.

Further research is needed to explore additional factors influencing victimization patterns and inform targeted interventions for reducing sexual violence on college campuses.

ECONOMICS

SMALL INVESTORS' GAMESTOP STRATEGY IN THE 'DUMB MONEY' MOVIE: A GAME THEORY ANALYSIS

Presenter(s): Monehin, Anthony, Graduate, Economics

Mentor: Dr. Susan Chen

This paper utilizes a game of strategy to analyze the GameStop short squeeze involving small investors, as portrayed in a scene in the movie "Dumb Money" (2023). It examines how individual rationality and collective outcomes interact, highlighting decision-making complexity. The analysis focuses on a simultaneous move game between two types of small investors namely Riri, a student, and Jenny, a full-time nurse. The freezing of the Reddit page and the buy-in options on the Robinhood trading app add complexity to the game. The study emphasizes game theory's transformative potential in enhancing decision-making, particularly in dynamic environments such as financial markets.

GAME OF STRATEGY MODEL ON A MOVIE TITLED MAGIC MIKE'S LAST DANCE WRITTEN BY REID CAROLIN IN 2023 ON NETFLIX

Presenter(s): Omitoyin, Grace, Graduate, Economics

Mentor: Dr. Susan Chen

Magic Mike's Last Dance (2023) showcases the various outcomes of what dance does to the human species, especially with the belief that people can be numb, disconnected, and desensitized. This paper examines strategic interactions between Maxandra Rattigan, a wealthy woman from London grappling with divorce and depression, and Mike Lane, a middle-aged Millennial white male who finds himself adrift in a sea of failed relationships and unfulfilled dreams. A simultaneous-move game will analyze Maxandra's strategies to leverage her connection with Mike for further business opportunities.

ENGLISH

“MOM, DAD, ARE YOU OK?”: CHAPERONING, EMPATHY, AND AETONORMATIVITY IN MENTAL HEALTH PICTURE BOOKS

Presenter(s): Cintron-Gonzalez, Edcel Javier, Graduate, English

Mentor: Dr. Mary Moran

Discussions on mental health in children’s literature have become essential to understand how adult authors are opening spaces to have conversations about mental health. In *Children’s Literature as Critical Thought*, Kenneth B. Kidd explains how “children's literature is a set of experiments in thinking and feeling” (4). Therefore, the proposed paper will explore mental health picture books by utilizing three main theories – Meeusen’s concept of chaperoning between parents and children, representations of adult mental health in picture books as an opportunity for empathy, and how adults talk with their children about mental health issues as a way against aetonnormative practices into talking to children about specific issues. I will examine the picture books *Pockets Full of Rocks: Daddy Talks About Depression* by Yair Engelberg and *A veces mamá tiene truenos en la cabeza* by Bea Taboada. The act of chaperoning opens the space for parents to be placed in the same reader/viewer position as the child while reading picture books. Empathy is used to answer questions the child reader might have about the mental health situations the characters are having, which then places the adult as a resource to explain how “feelings for the other – feelings of sympathy, compassion, tenderness, and the like – produce motivation to relieve the suffering of the person for whom empathy is felt” (4). Therefore, chaperoning and empathy serve as key points to describe the work mental health picture books are doing for both a child and adult audience.

QUEERNESS THE ILLNESS: THE VICTORIAN INVENTION THAT CHANGED HOW WE UNDERSTAND SEXUALITY

Presenter(s): Rimer, Louane, Undergraduate, History

Mentor: Dr. David Hansen, English

Viewed as taboo, scholarly work on venereal disease before the 20th century was rare in academic spaces. This gap in research was filled by 19th-century Spiritual Health communities, which sought to combine theology and medical practice for 'healthier' living and saw STD treatment as another aspect of this process. However, as their work needed to be spiritually based, research done in this setting was often inaccurate and unscientific.

Spiritual health leaders pressed heavily that disease was a product of moral character. 'Immoral' sexual acts, mainly anything done without the purpose of reproduction, were considered a moral failing, which would inevitably lead to poor health by their model. Male sexuality outside of reproduction; specifically self-copulation and male-to-male copulation, were considered especially dangerous to one's health. Due to a lack of more reliable research, the first standardized science textbooks used in U.S. K-12 schools after WWII relied heavily on sources created by the spiritual health movement to fill in research gaps on sexuality studies. If this is the case, then adults today would subconsciously project 19th-century misinformation when discussing sexuality, identifying a possible link between one's education and their political biases. A guideline was formed to help identify specific links. For a source to be considered relevant to the initial 19th-century studies, it must either directly quote and or source it, mention phrases coined by it, or reverberate sentiments that could be easily linked to it. This project was split into two parts, looking for a connecting factor between the text and the belief. First, writing done by three spiritual health community leaders from the mid-19th century and three STD researchers from the 1950s was compared to search for underlying linguistic similarities. Secondly, a sociological survey was conducted on adults aged 40+ with a control group of adults aged 18-40 educated at the K-12 level in the U.S. The survey consisted of questions regarding the subject's education on sexuality and their current beliefs. Their answers were analyzed under the same guidelines as the studies from the 1950s. While there are a variety of factors playing into current misinformation, the generational impact of the spiritual health movement appears to play a leading cause in the current misinformation cycle plaguing American perspectives on gender and sexuality.

CONSONANT CLUSTER REDUCTION IN THE MONOMORPHEMIC FINAL CLUSTER OF -ST AS PRESENTED IN AFRICAN AMERICAN ENGLISH

Presenter(s): Stogsdill, Kara, Undergraduate, English

Mentor: Dr. K. Aaron Smith

This study examines the final consonant cluster reduction rate in African American English (AAE) utilizing speech samples from the Corpus of Regional African American Language (CORAAL). Words with the final consonant cluster -st were examined for the rate of cluster reduction. Cluster reduction rates were compared across speaker gender, sample date, and three phonological positions- before a vowel, an oral stop, and a consonant. The reduction rate was then compared to the frequency of the word use, with the prediction that speakers would reduce at a higher rate and outside of the normal parameters for reduction when using high-frequency words. Word frequency rates were determined through information provided by the Oxford English Dictionary's word frequency bands. The hypothesis is that high-frequency words will be reduced more than less frequent words. High-frequency words will also have a higher reduction rate before a vowel even though that is the dispreferred deletion environment and where reduction should be least likely. Higher frequency words will also reduce at the highest rates before an oral stop, as speech patterns will reduce the final consonant cluster more likely at the end of an utterance. The objectives of this study are straightforward and guided by the following research questions. Does consonant cluster reduction occur more in high-frequency words than in less common words? The initial theory was the more common the word was, the likelier it would be to have a reduction in the ending consonant cluster. Is consonant cluster reduction more likely to happen at an oral stop in speech than when speech is continuous? The initial theory is that natural speech patterns make it more likely for these ending sounds to fall off when speech ends. I created two primary research objectives to answer these questions. Objective 1 was to analyze the speech samples to determine the overall reduction rate in each target word. Then, reduction rates would be compared to word frequency to determine if higher-frequency words reduce at higher rates. Objective 2 was to compare the positive samples for reduction to the syntactical structures of the target word to determine if reduction occurs more frequently when followed by an oral stop, consonant, or vowel. A secondary research objective was to compare positive samples across sociolinguistic categories of age and gender to determine if there is a reduction trend among these categories.

FAMILY AND CONSUMER SCIENCES

EXPLORING AI IN RETAIL: INNOVATIONS IN VISUAL DISPLAY DESIGN

Presenter(s): Ho, Linh, Graduate, Family and Consumer Sciences

Mentor: Dr. Yoon Jin Ma

Authorship: Linh Ho, Yoon Jin Ma

Artificial intelligence (AI) is opening a creative process in a new era of innovation and efficiency in design, particularly in visual merchandising. The aesthetic appeal of retail displays has enormous potential as a key selling point and enhancing brand identity. Today, retailers use visual merchandising to make them stand out in the market and ultimately draw more customers. This study explores using an AI generator to investigate elements and principles of the art of design in the visual display of retail stores, aiming to identify strategies that promote marketing campaigns and raise levels of design through specific brand display concepts in stores.

Utilizing an AI image generator based on the design fundamentals, presenting the elements and principles of art and design to examine various genres of images for a visual display by applying different prompts. Results will be compared to derive the most effective suggestion for the image creation process. A roadmap may be developed based on the findings.

This study will provide practical insights for design managers in using technology to create different types of displays that effectively grab the customers' attention, hopefully leading to more sales. It also suggests an innovative and appealing way to signage, posters, banners, and other displays in order to promote seasonal sales programs and highlight brand values.

Moreover, educators can use these guidelines as a foundation resource for teaching students the first step to applying AI to their design purpose, preparing them for the fashion industry's quickly changing styles and technologies.

CAN LUXURY FASHION BRANDS AND SOCIAL RESPONSIBILITY GO HAND IN HAND? AN ANALYSIS OF RECENT CSR REFORMS ON ANIMAL CRUELTY PRACTICES FOR FUR IN LUXURY GIANTS.

Presenter(s): Kaur, Mankirat, Graduate, Family and Consumer Sciences

Mentor: Dr. Yoon Jin Ma

Authorship: Mankirat Kaur, Yoon Jin Ma

Luxury fashion houses, for an exaggerated period of time, have used animal skins for leather, feather, and fur, extracted specifically from lizards, alligators, foxes, buffalo and more to produce exotic fabrics used in their high-end collections. Every second, three animals die just for their fur and as of now, the fur industry is worth \$22 billion, however it is banned in 19 European countries. While companies like Stella McCartney are embracing vegan fashion and removing animal cruelty, luxury giants like Max Mara Fashion Group, spread across 105 countries continue to use animals, specifically for fur extracted from the fur farms of Finland and China. According to Vogue 2021, people condemn the use of animals in fashion and 80% of the surveyed consumers acknowledged the welfare of animals while shopping.

This research investigates reforms and initiatives taken by luxury fashion brands to end the practice of animal cruelty for acquiring fur considering the current situation. Through content analysis, we compare 20 famed luxury companies' recent CSR and environmental responsibility reports to identify their current and future stance on the application of animal fur in their designs. We investigate the credibility of the information through current news articles, top animal welfare organizations, NGO websites, and controversies regarding the analyzed companies. The collected data and research aim to clarify the recent development of policies and strategies, together with the direction of the major fashion players in eradicating the practice of animal cruelty for fur in the luxury fashion market.

UNVEILING THE AMPLIFYING IMPACT OF FASHION ON SELF-ESTEEM

Presenter(s): Kaur, Mankirat, Graduate, Family and Consumer Sciences

Mentor: Dr. Christina Soyoung Song

Authorship: Mankirat Kaur, Christina Soyoung Song

Fashion, an artistic medium for self-expression, significantly impacts our psychological well-being and emotions. The choice of attire can transform mood and enhance confidence, serving as a tool for improving emotional states and advancing in professional and personal realms. This study aims to explore the relationship between fashion and self-esteem, focusing on the understanding and appreciation of one's body type, the development of a unique style, the influence of fashion influencers, and the social impact of clothing.

Hypotheses:

1. Awareness of one's body type positively affects self-esteem.
2. Unique personal styling boosts self-esteem.
3. Emulating fashion influencers' styles enhances self-esteem.
4. Understanding the social impact of attire influences self-esteem.

Theoretical implications of this study include understanding fashion's psychological impact and its integration into mental health improvement methods. Managerial implications are evident in self-improvement programs and business strategies for styling firms, offering insights for enhancing self-esteem and confidence through fashion. In conclusion, this research underscores the empowering aspect of fashion styling as a form of self-expression. It provides evidence of how fashion can foster a healthier lifestyle, both internally and externally, by influencing perceptions and encouraging individuals to dress for themselves, not just societal norms. This study aims to extend knowledge in fashion styling, emphasizing its significance in fostering a positive self-image and well-being.

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THE FUTURE OF FITTING ROOMS: ARE VIRTUAL TRY-ON MIRRORS A SMART CHOICE FOR THE FUTURE OF RETAIL?

Presenter(s): Pearson, Bree, Undergraduate, Family and Consumer Sciences
Watson, Emma Undergraduate, Family and Consumer Sciences
Caserio, Caroline, Undergraduate, Family and Consumer Sciences
Mentor: Dr. Christina Soyoung Song
Authorship: Bree Pearson, Emma Watson, Caroline Caserio, Christina Soyoung Song

With ever-evolving technology, trying on clothes in fitting rooms has become more advanced and convenient than ever before. The fashion industry is embracing this advancement by introducing smart mirrors that could potentially revolutionize the shopping experience both in-store and at home. With virtual try-on technology, customers can now digitally try on clothing and accessories using devices such as phone cameras or digital mirrors that layer the items onto the customer. Major players such as Ulta and Sephora now offer customers the ability to try on makeup through smart technology and apps, while H&M is utilizing tech-enabled shopping experiences to enhance customer interest in their store. Our research aims to uncover the benefits of smart mirror technology, including how it can influence consumers' clothing choices, and how it can be further improved to provide a seamless and immersive shopping experience.

Virtual try-on technology, exemplified by smart mirrors, is redefining the retail experience in the fashion industry. This technology provides a highly personalized and engaging shopping experience, addressing common challenges such as inaccurate self-measurement and the time-consuming trial of finding well-fitting clothes. By facilitating easier and faster selection processes, these mirrors not only enhance shopping convenience but also inclusivity, as seen in their adoption by major brands like Adidas and Macy's. This technological advancement has significantly influenced both brick-and-mortar and online sales, notably reducing the high return rates associated with online purchases. Despite its benefits, the technology's widespread implementation remains limited, with many retailers yet to embrace it. Additionally, some customers express reluctance due to the absence of physical interaction with the clothing, highlighting the need for businesses to make this technology more accessible and user-friendly. Fitting rooms, a staple in fashion retail, benefit greatly from the integration of smart mirrors. These advanced mirrors offer more than just reflections; they provide personalized clothing recommendations, styling tips, and even visualizations of outfits in different colors. Their role in enhancing the customer experience is crucial, catering to diverse needs and preferences. Moreover, smart mirrors create a unique and enjoyable shopping experience, which can be leveraged by businesses for brand promotion through customer-generated content on social media.

In summary, virtual try-on technology, particularly through smart mirrors in fitting rooms, offers a transformative shopping experience, combining convenience, personalization, and enhanced customer engagement via social media, with potential for further adoption and improvement in the retail sector.

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RESTAURAN DESIGN FEATURES IMPACTING THE EXPERIENCE OF HARD-OF- HEARING INDIVIDUALS

Presenter(s): Ross, Olivia, Undergraduate, Family and Consumer Sciences
Kmieciak, Lorin, Undergraduate, Family and Consumer Sciences
Mentor: Dr. Reem Bagais
Authorship: Olivia Ross, Lorin Kmieciak, Alaina Zajac, and Reem Bagais

Background: Restaurants are popular social gathering spaces that need to be equipped to handle a wide variety of people on a daily basis. According to US Foods, 63% of people care most about atmosphere and experience when dining out (The Dining Dispatch: 2023 American Dining Habits, 2023). Additionally, the National Institute of Deafness and Other Communication Disorders stated that about 15% of American adults, approximately 37.5 million people, ages 18 and older report having some trouble hearing (Quick statistics about hearing, 2021). Hearing related disabilities often go unnoticed and are typically invisible, eliminating the opportunity for impromptu accommodations. Therefore, addressing the increasing need for inclusivity in restaurant design can be best met through the enhancement of the pre-existing space. The purpose of this research is to highlight the deficiencies of restaurant design for hard-of-hearing individuals and provide design guidelines in that regard. This research allows for diverse individuals to co-exist within commercial spaces more effortlessly.

Method: This research aims to address how existing restaurants can adapt new design considerations to a diverse and inclusive range of users, including those with hearing difficulties. The study used two methods: (1) Observing human behavior in an upscale, bi-level restaurant setting and (2) identifying design criteria related to people that are hard-of-hearing established in the literature. The research question is: What design guidelines can be easily implemented in an existing upscale, bi-level restaurant to fit the needs of people who are hard-of-hearing? Data was gathered from on-site observations based on environmental conditions, path and wayfinding, behavioral settings, and ergonomics of restaurant design.

Findings: The research findings underscored accessible design guidelines and solutions specifically tailored for individuals with hearing impairments in upscale, bi-level restaurants. These insights were derived from both direct observations and empirical findings. The observation provided insights into areas of strength, exemplified by light fixture selection, ceiling design, and separation of spaces, and areas that require improvement, such as noise level, material selection, and wayfinding. The empirical findings provided evidence of design solutions related to the population of interest, including acoustical solutions, signage, and choreographed lighting design.

Significance: The incorporation of inclusive design elements into an existing space offers the improvement of function, accessibility, and experience for all users. This research will provide an understanding of the importance of inclusive restaurant design and offer design guidelines for the hospitality industry, restaurant owners, and designers. The creation of design guidelines allows all users, including the hard-of-hearing users, to comfortably recognize and utilize restaurant spaces.

REVIEW OF AI APPLICATIONS IN THE FASHION INDUSTRY

Presenter(s): Tellez, Chantal, Undergraduate, Family and Consumer Sciences

Mentor: Dr. Christina Soyoung Song

Authorship: Chantal Tellez, Christina Soyoung Song

Artificial intelligence (AI) has been incorporated into many industries, including engineering, physics, and retail businesses. In the fashion retail sector, AI has improved efficiency in supply chain management, cost and pricing analysis, design development, mass customization, consumer marketing, and product merchandising. With the increasing importance of AI, this study reviews the current status of AI applications in the fashion industry to synthesize current knowledge in the field and provide a comprehensive overview. The findings summarize that AI integration is particularly evident in fashion marketing campaigns, app development, and in-store technology for enhancing advertising effectiveness, customer shopping experiences, and providing product information and personalized recommendations. By examining existing literature, this study identifies new areas for future research needed to continue technological innovation in the fashion industry and contributes to advancing knowledge in AI technology adoption.

HISTORY

MAPPING ROMAN MARBLE

Presenter(s): Fried, Amalie Undergraduate, History

Mentor: Dr. Kathryn Jasper

Mapping Roman marble is beneficial for the understanding of the economical context that the marble trade existed within. By being able to map Roman marble --and connect it to the Diocletian price ranges as defined in Diocletian's edict of maximum prices --researchers can have better perceptions of the Roman economy, culture, and the magnitude of wealth portrayed with marble.

MAPPING ROMAN AGRICULTURE IN NORTHWEST BOLSENA

Presenter(s): Ridinger, Lillian, Undergraduate, History

Mentor: Dr. Kathryn Jasper

My proposed poster will present preliminary results from research conducted on the site of Valle Gianni as part of the Northwest Bolsena Archaeological Project during summer 2023. Located near the town of Gradoli in Lazio, Valle Gianni contains the remains of a monumental Roman fountain (nymphaeum) and wine press. Answering questions about the identity and motivations of the nymphaeum's owner depends on understanding how the construction of the nymphaeum related to the agrarian economy. The goal of this project was to collaborate with Dr. Kathryn Jasper in her work reconstructing ancient agricultural economies and trade networks around the monument. The project sought to create a GIS model of Roman agriculture in the region. Two questions guided the design of the model: Which crops were grown in the region at given in moments in time? And what were the approximate yields of these crops? We attempted to understand pre-modern approaches to agriculture that could inform a GIS model. As medieval agricultural practices resemble ancient approaches more than modern, we collected data from the oldest documents recording medieval agriculture in northern Lazio from around the year 1000 through 1300. These documents describe property transactions that include references to agriculture, waterways, and natural resources in the region. We concluded that the region historically had both small- and large-scale agriculture but that most of the landscape was broken into small pieces, and relations between landowners and tenants determined the organization of crops.

THE DISPLACED PERSONS QUESTION: A TURNING POINT IN THE POLISH AMERICAN CONGRESS' LOBBYING ACTIVITIES

Presenter(s): Zawadzka, Wiktoria, Undergraduate, History

Mentor: Dr. Katrin Paehler

Authorship: Wiktoria Zawadzka

The end of WWII found many people uprooted and in need of food, medicine, and shelter. As a short-term solution, these people were labelled as displaced persons (DPs) and placed in DP camps. Based on interallied agreements, these people were to be repatriated to their countries. However, many non-Jewish DPs did not want to return to their homeland, which were now under the Soviet sphere of influence. On the other hand, Eastern European Jews did not have any home to return to and hoped to resettle outside of Europe.

The literature thus far focuses on the struggles of Jewish DPs and the efforts of Jewish-American lobbies to change United State immigration law. They hoped to amend the pre-war immigration system to increase the number of Jews allowed into the country. However, Polish-American lobbying efforts are rarely discussed. Their inclusion allows for a more nuanced understanding of both the DP issue and the eventual change in immigration law.

My research focuses on these Polish-American lobbying agencies. The Polish American Congress (PAC), a large political umbrella organization representing Polish-American interests, was one of these agencies. Aware of the DP issue, this organization exercised its desire to provide aid through numerous lobbying efforts; their chief focus was to amend immigration law to allow an increased number of Poles into the United States.

My work sketches the lobbying activities of the PAC in the run-up to the DP Act of 1948, with a particular focus on their Report to Secretary Byrnes on Conditions in Polish Displaced Persons Camps in the American Zone of Occupation in Germany. This report described the conditions in the camps, using this as a basis for their demand to change immigration law. In combination with their political savvy and persistent media presence, this report was able to garner favor from politicians and aid in passing the DP Act of 1948.

Taking this report into consideration is critical to understanding the history of lobbying for the DP Act and DP issues in general. By providing a clear history of this report, the history of DPs is represented in a more accurate light; one that closes previous gaps of knowledge on the issue.

INFORMATION TECHNOLOGY

TEMPERATURE EFFECTS ON NEURONAL ACTIVITY

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

Mentor: Dr. Rosangela Follmann

Co-mentor: Dr. Epaminondas Rosa

Authorship: Twinkle Jaswal, Epaminondas Rosa, Rosangela Follmann

Neurons, serving as the essential components of the nervous system, facilitate information transmission through a combination of electrical impulses and chemical signals between different brain areas. Within this intricate neuronal network, synchronization is a crucial phenomenon where multiple neurons fire action potentials simultaneously. Synchronization not only coordinates brain activity but also aids in memory consolidation, fostering effective collaboration across different brain regions. Nevertheless, when synchronization becomes excessive, it can lead to the manifestation of brain disorders like epilepsy.

Computational modeling of neurons offers a robust tool for understanding neurological processes, including disorders like epilepsy. This is a condition affecting approximately 50 million people globally, with several possible causes and having temperature identified as a potential trigger for seizures.

Understanding the broader impact of temperature on health, maintaining the body's baseline temperature is crucial, as deviations, even by a few degrees, can have detrimental consequences. Hyperthermia, associated with sudden infant death syndrome, for example, involves an elevated temperature at the time of death. Additionally, in children, heightened temperatures commonly act as triggers for febrile seizures. By connecting the intricate dynamics of neurological processes, and temperature-related health risks, our research endeavors to contribute to a more comprehensive understanding of epilepsy and its possible connections to temperature. In this work, we developed a biophysical model to simulate and analyze a network of coupled neurons following the functional connectivity prior to the onset and during the seizure itself. We also investigated how change in temperature in the proposed model can trigger seizures, mimicking the conditions observed during fever induced seizures in infants. The computer simulations we perform use a quantitative neuron network model based on the Hodgkin-Huxley equations and offer a meaningful mathematical representation of neural processes associated with epileptic seizures. Our results may contribute to aiding in the understanding of epileptic seizures and in developing much needed detection and prevention strategies for them.

FRAMEWORK FOR ANALYZING BRAIN ACTIVITY IN REAL TIME

Presenter(s): Whitney, Nathan, Undergraduate, Computer Science
Mentor: Dr. Rosangela Follmann
Co-Mentor: Dr. Epaminondas Rosa
Authorship: Nathan Whitney, Epaminondas Rosa, Rosangela Follmann

The brain is a complex organ with billions of neurons that interact with each other, providing many functions through neuronal synchronization. Understanding the mechanisms underlying this synchronization is important for studying memory consolidation, sleep disorders, Parkinson's disease, and epilepsy. Brain activity can be recorded using electroencephalogram (EEG) headsets which read the electrical activity of certain areas of the brain. In this work we developed an approach for collecting and analyzing EEG data in real-time. This approach consists of detecting the emergence of synchronization which in the case of epilepsy means a seizure is underway. Real-time EEG data analysis allows for faster detection of events associated with neuronal disorders, possibly predicting brain events before they happen, or showing real-time brain activity with motor movements. This can allow for the development of preventive measures to stop abnormal brain activity from spreading through the brain.

KINESIOLOGY AND RECREATION

DIFFERENCES IN HEART RATE VARIABILITY, STRESS SCORES, COHERENCE, AND VO2 BY COVID-19 VACCINATION STATUS

Presenter(s): Deer, Nina, Graduate, Kinesiology and Recreation
Morse, Mady, Undergraduate, Kinesiology and Recreation
Mentor: Dr. Dennis, Karen
Authorship: Nina Deer, Mady Morse, Karen Dennis, Alex Wolfe

INTRODUCTION: Stress has been shown to influence heart rate variability (HRV) (Taelman et al., 2009). HRV describes the time interval between heartbeats and is correlated to overall aspects of health and disease, including cardiovascular disease and cardiovascular mortality. During stressful events, the sympathetic nervous system is activated. Physiologically, stress appears in the form of lowered HRV, with decreased parasympathetic (PS) activity, increased sympathetic (S) activity, and increased levels of cortisol.

Alternatively, shifting the autonomic balance towards increased PS activity can be achieved through stress managing training and practice using management methods. Rhythmic breathing and active self-generating positive emotion training may shift the autonomic nervous system (ANS) balance towards increased PS activity (Culbert, 2014). Multiple reports have indicated that COVID-19 vaccination may be related to autonomic nervous system dysfunction, which may be partially explained by a systemic inflammatory response (Nushida et al., 2023). HRV and its association with inflammatory conditions has been extensively investigated (Williams et al., 2019). HRV is a strong indicator of autonomic function, while both acute and chronic inflammation are also closely related to autonomic dysfunction.

PURPOSE OF THE STUDY: The purpose of this study is to identify differences in heart rate variability, perceived stress (stress index SI), coherence, and VO₂ following implementation of stress-reduction techniques and physical activity comparing subjects who received COVID-19 vaccination and those who did not. **METHODS:** Students enrolled in a personal health/wellness course reported COVID-19 vaccination status and underwent measures to assess physical fitness, heart rate variability (HRV), coherence, and stress index. Students enrolled in a health and wellness course during the fall of 2023 were subjects for the study. Throughout the 16-weeks, students participated in physical activities that targeted improving fitness, which was assessed through pre- and post-testing. HRV measurements were gathered at both pre- and post-testing using the HeartMath emWave Pro software measured by a pulse plethysmograph ear sensor along with physical fitness data (ht, wt, body comp., VO₂ (1-mile walk test)) and SI (State-Trait Anxiety Inventory for Adults, Polar Tri-Fit software). Weekly "Release It" assignments were given through the HeartMath Institute website to focus on teaching students how to implement breathing techniques, attitude, and heart-brain connection in their own lives. **RESULTS:** A total of 64 students provided vaccination status, with 40.6% receiving the COVID-19 vaccine. Paired-sampled t-tests were calculated to examine differences in pre- and post- assessments, separated by vaccination status. The results of this study found statically significant differences between measures of R-R intervals ($t_{(25)}=-.2.36$, $p=.027$) and VO_{2max} ($t_{(30)}=-.4.44$, $p<.001$) in the non- vaccinated group. Cohen's effects size values suggest a "medium" and "large" practical significance respectfully. Statistical significance was not reached for any other health measures for either the vaccinated or non-vaccinated group. **CONCLUSION:**

Differences were observed in R-R intervals and VO2 max in the non- vaccinated group. There were no significant differences in the vaccinated group. The other measures did not reach significance. The results contradict the literature whereas those who did not receive the vaccine had a decrease in HRV. In the future, the study should be repeated to measure the long-term effects of COVID-19 vaccination and HRV. There is data to support stress reduction techniques and improving HRV however, the current data is inconsistent in finding differences between COVID vaccination status and HRV scores.

CONCURRENT VALIDITY AND RELIABILITY OF THE VERTICAL JUMP AND STANDING BROAD JUMP TESTS IN YOUTH

Presenter(s): Faamoe, Isaac, Graduate, Kinesiology and Recreation

Mentor: Dr. Kelly Laurson

Authorship: Isaac Faamoe, Kelly Laurson, Tyler Kybartas, Samantha McDonald

Muscular power is an important component of fitness with implications for bone health, explosiveness in movements, and predicting long-term health outcomes. However, the literature is scarce concerning commonly used muscular power field tests among youth, including vertical jump (VJ) and standing broad jump (SBJ). **PURPOSE:** To investigate the relationship between VJ and SBJ, as well as factors impacting reliability of each movement. **METHODS:** Approximately 600 students (9-14 years of age) in grades 4-8 participated in the testing of the VJ and SBJ. Pearson correlations were used to evaluate relationships between jump variables and intra-class correlations (ICC) were used to examine reliability of the VJ and SBJ. **RESULTS:** VJ had a positive and strong relationship with SBJ ($r = 0.74$), all $p < 0.05$.

ICC analyses demonstrated VJ had a moderate reliability ($ICC = 0.54$, $p < 0.05$) with SBJ. **CONCLUSIONS:** Pearson correlations show the VJ has a positive and strong relationship with SBJ. The VJ displays moderate reliability with SBJ. While each are used as field assessments of lower body power in youth, each contributes unique variance during assessment. Further investigation is needed to better determine this unexplained variance.

SEGMENTAL LEAN MASS ANALYSIS: COMPARING DUAL-ENERGY X-RAY ABSORPTIOMETRY AND THE INBODY 570

Presenter(s): Ruman, Faith, Graduate, Kinesiology and Recreation

Mentor: Dr. Kelly R. Laurson

Body composition is important in understanding overall health and making informed decisions relative to lifestyle, such as diet and physical activity. Dual-Energy X-Ray Absorptiometry (DXA) is currently the gold standard for assessing body composition, working off of a three-component model of fat mass, bone mass, and non-bone lean mass. Additionally, DXA can be used to examine segmental lean mass of different body pieces (e.g., trunk, legs, arms). Similarly, the InBody 570 (IB-570) is a noninvasive device that sends electrical current through the body in order to estimate body composition via bioelectrical impedance (BIA). The IB-570 can also be used for segmental composition. The purpose of the proposed study is to investigate the agreement in segmental body composition measures assessed by DXA and eight-electrode Bioelectrical Impedance Analysis (BIA) in college-aged adults. To our knowledge, there are currently no studies comparing the IB-570 and the DXA in regards to segmental lean analysis. Existing literature is limited, with some studies comparing only whole body fat and fat free mass or using different versions of the InBody BIA device. Through this study, we hope to determine if the less expensive and less invasive IB-570 can be an accurate and more feasible method compared to DXA for segmental body composition analysis.

META-ANALYSIS COMPARING TRADITIONAL ACUPUNCTURE POINTS AND AHI- POINTS: DELAYED-ONSET MUSCLE SORENESS

Presenter(s): Shao, YuFang, Graduate, Kinesiology and Recreation

Mentor: Dr. Kelly R. Laurson

Authorship: YuFang Shao, Kelly R. Laurson

Delayed onset muscle soreness (DOMS) is a type of muscle injury that can occur following moderate-to-high intensity physical activity. More recently, acupuncture has been considered as an alternative treatment method for muscle injury, which includes DOMS. However, there have been no specific investigations into potential differences when using traditional acupuncture (points based on traditional Chinese medicine theory), Ashi-acupuncture (points not on Chinese meridian, also known as tender points), or sham-acupuncture (superficial points, or points neither on the Chinese meridian nor the tender points) for treatment of DOMS.

PURPOSE: To investigate the effectiveness of acupuncture treatment with traditional acupoints, Ashi points, and sham acupuncture to treat exercise-induced DOMS. **METHODS:** Data collected through November 2023 were reviewed, sourced from seven digital databases. The study focused on reviewing the acupuncture points selection and location and treatment methods, pain measured on a visual analog scale (VAS) right after intervention was set as outcome.

Data was compiled and evaluated using meta-analyses. **RESULTS:** A total of six articles were included. The results showed that there were no significant differences between VAS for all groups (all $p > 0.05$). The standardized mean difference (SMD) of the VAS right after treatment between the Ashi-points and control group was 0.65 (95% CI: -3.4, 5.2). Similarly, comparisons of the Ashi-points with sham acupuncture (SMD = -1.5, 95%CI: -7.4, 3.2) and traditional points (SMD = -0.21, 95%CI: -5.1, 4.5) were also not significantly different.

CONCLUSION: Acupuncture was not an effective treatment for DOMS, regardless of using Ashi, traditional, or sham acupuncture treatment.

MATHEMATICS

AN EMPIRICAL TEST OF CONDITIONAL AND UNCONDITIONAL CAPITAL ASSET PRICING MODEL (CAPM): APPLICATION IN TESLA STOCK

Presenter(s): Ahmed, Gulzar, Graduate, Mathematics

Mentor: Prof. Xing Wang

Authorship: Gulzar Ahmed, Xing Wang

CAPM is the crucial model to measure the relationship between expected return and risk related to an asset. It assumes a positive relation between the return on an asset and the risk (beta coefficient) associated with that asset. The systematic or market risk (alpha) is also an important factor for the assessment of asset price.

Most prominently, the CAPM does not explain why, over the last 40 years, small stocks outperform large stocks, why firms with high book-to-market (B/M) ratios outperform those with low B/M ratios (the “value premium”), or why stocks with high returns in the previous year continue to outperform those with low prior returns (“momentum”). This paper aims to empirically observe the unconditional and condition CAPM. We ensured the specification of the application of CAPM using econometric models and tested the assumption of these models. Further, we applied the most suitable model to forecast the average returns of Tesla after analyzing both unconditional and conditional CAPM models. Our linear regression model results show the risk factor beta value is 1.19 for TESLA which means that TESLA stocks are more volatile than the overall market. It implies that 1 % change in the stock market the TESLA stock return will change by 1.19 %. Further, we apply the conditional CAPM using ARCH and GARCH models that contain the conditional variance of the residual to calculate the short-term shock and represent the long-term persistence to forecast TESLA average returns. Based on our forecast, this paper implies that TESLA stock returns will decrease for September and October 2023.

NURSING

MUSIC IN THE NICU

Presenter(s): Baxter, Alyssa, Undergraduate, Nursing

Mentor: Dr. Denise Hammer

Objective: A literature review was completed as part of a Honors Independent Study in Nursing to explore the effects of music interventions on infants in the neonatal intensive care unit (NICU).

Background: The NICU can be a stressful environment for infants due to unpleasant stimulation from testing, procedures, and monitors. This can lead to elevated vital signs (heart rate, respirations, and oxygenation), poor feeding, and longer hospital stays. Music played in the background during their stay is being explored as an intervention to improve the infants' status.

Methods: This literature review was conducted with a thorough search of the CINAHL database to answer the question: "In infants during their stay in the NICU, how does music affect their vital signs, length of stay, and quality of feeding"? Search terms used were "NICU" OR "neonatal intensive care unit" OR "special care" OR "baby unit" OR "newborn intensive care" AND "music therapy" OR "music intervention" OR "musical therapy." We limited the sources to peer reviewed articles in the English language from 2018-2023. We reviewed the abstracts of each of these articles to determine which ones were applicable to our research question.

Results: Twenty-three articles were found applicable and selected for further review. Using the Johns Hopkins Nursing Evidence-Based Practice Model, fourteen of the full articles reviewed were of high quality and nine of them were of good quality. Researchers for these studies showed that the infants' heart rate, blood pressure, and respirations positively decreased when music was played. Oxygen saturation level and sleeping times improved with musical intervention. Some studies researchers found a decrease in hospital stay length for infants that regularly received music. However, in other studies researchers did not find a true causal relationship between the music and the infant's condition improving since the infants were receiving a variety of nursing interventions during their stay.

Conclusion: The findings from the literature review indicate a positive relationship between music and the infant's health in the NICU. However, more studies would need to be completed to find a strong correlation.

IMPACT OF MUSIC ON THE RELATIONSHIP BETWEEN PARENTS AND INFANTS IN THE NEONATAL INTENSIVE CARE UNIT AND AT HOME

Presenter(s): Leffers, Rebecca, Undergraduate, Nursing

Mentor: Dr. Denise Hammer

Objective: This literature review investigates the use of music interventions for parents and family members of infants in the neonatal intensive care unit (NICU) and once home. This literature review was completed as an honors independent study. The research question addressed is: How can the use of music impact the relationship between parents and their infants in the NICU and once home?

Background: The NICU is a very stressful environment for both the infants and family members. A variety of interventions have been studied to address stress for both the infant and their family in the NICU. Music in the NICU is one of these interventions. Researchers evaluated music interventions to determine if there is an improvement in relationships between infants and their parents and if there is any health improvement for the infant.

Methods: This literature review was conducted in Fall of 2023 using the CINAHL database. The search was conducted by three honors nursing students together, then each student reviewed the articles that fit that nursing student's research question. The search was limited to peer reviewed articles written in English. The search terms used were "NICU" OR "neonatal intensive care unit" OR "special care" OR "baby unit" OR "newborn intensive care" AND "music therapy" OR "music intervention" OR "musical therapy". We reviewed the abstracts of each of these articles to determine which ones were applicable to our research question.

Results: For this research question, fifteen articles were found applicable and were selected for review. The articles were rated according to the Johns Hopkins Nursing Evidenced-Based Practice Models. The main uses for music intervention were for relaxation and decreased anxiety, parent/infant bonding, and bereavement support. The music interventions were performed both in the hospital and in home care settings.

Conclusions: Music is a positive intervention for the relationship between parents and their infants in the NICU setting and when NICU infants are home. Music increases the emotional and physical bond between parent and infant. In cases where an infant is too sick and must transition into palliative care, music can help parents cope with their loss. Overall, additional research should be performed, but according to this research music does positively impact the relationship between parents and infants.

PHYSICS

WHY IS THERE MORE REJECTED ENERGY?

Presenter(s): Cole, Seth, Undergraduate, Physics

Mentor: Dr. David Marx

According to the EIA (Energy Information Agency) and LNL (Lawrence Livermore National Laboratory), The amount of rejected energy has been going up since at least 2005. Primary reasons for this include different methodologies to gather the data, and massive decreases in industrial efficiency. This decrease in the amount of useful energy has big implications that would impact government and private sector policy. This decrease ought to be investigated and brought to light so that more of the scientific community and general public are aware of the increase of this rejected energy. Understanding the reasoning behind the increase in rejected energy could motivate innovations to increase efficiencies which would be beneficial to the public and private sectors.

MODEL EQUATIONS FOR C. ELEGANS' THERMOTAXIS

Presenter(s): Gomez, Lylia, Undergraduate, Physics

Mentor: Dr. Epaminondas Rosa Jr.

Authorship: Lylia Gomez, Zach Mobbille, Andres Vidal-Gadea, Rosangela Follmann,
Epaminondas Rosa Jr.

Caenorhabditis elegans is a free-living worm inhabiting temperate environments across the Earth. This animal demonstrates to possess various properties that are relevant in human biology, including temperature sensing. The work presented here aims at improving the understanding of the underlying mechanisms of *C. elegans* locomotion response in cool and warm environments. We incorporate temperature features into a set of differential equations to create a mathematical representation of *C. elegans* Amphid Finger-like (AFD) neurons. The animal uses its memory of the cultivation temperature to perform migration behavior in temperature gradients. Our computational output shows consistency with experimental results, replicating the calcium dynamics of a real AFD neuron during temperature experiments. Using color maps in Arrhenius-based parameter space, we study how our model neuron responds to temperature variations. The findings suggest that intracellular activity observed in response to such changes may be caused by oscillating inputs to the cyclic nucleotide-gated (CNG) ion channels in the dendrite. This proposes a methodology for predicting the calcium response of AFD neurons in *C. elegans* in different temperatures.

To further this work, and with the question “What is the mechanism behind the AFD neuron’s ability for temperature sensing and making a decision on a particular motor output?” driving this research, we expand upon the single AFD neuron model by introducing an additional AFD neuron to study the finer motor outputs and details of the mechanism behind *C. elegans*’ thermotaxis. The presence of two neurons, positioned on the left and right sides of the presumed nose of the animal, serves the purpose of sensing temperatures on either side of the worm. Based on the sensed temperatures and the cultivation temperature, the neurons produce a motor output that leans either left or right. Through data representing differences in the calcium peak time responses of the neurons, we construct color maps to better understand the mechanism of thermotaxis at different temperature points. They indicate that the presence of two sensors, rather than just one, facilitates the worm’s decision-making process to move on one direction or the other.

DETECTION OF OPTICAL ANAPOLES IN MID-INDEX SEMI-CONDUCTING NANOSPHERES

Presenter(s): Hardaway, Alexander, Undergraduate, Physics
Sevik , Robert, Undergraduate, Physics
West, Carter, Undergraduate, Physics

Mentor: Dr. Uttam Manna

Authorship: Alexander Hardaway, Robert Sevik, Carter West, Prachi Sarwara, Mahua Biswas,
Uttam Manna

This study explores the concept of a "Kerker anapole" within the context of Mie scattering, a phenomenon that suggests that, under specific conditions known as Kerker conditions and with dipolar excitation, pure electric or magnetic scattering regimes can emerge, resulting in zero total scattering efficiency in the optical range. To investigate this, we illuminated spherical titanium dioxide (TiO₂) particles (average size ~1.1 microns) with tightly focused Gaussian beams (TFGBs) to mimic dipolar fields' scattering properties. Our research involved measuring the scattering spectra of individual particles in both forward and backward directions. The obtained results revealed distinct dips corresponding to the 1st and 2nd Kerker conditions. Remarkably, the scattering minima observed in the backscattered spectra closely matched those in the forward scattering spectra under TFGB illumination. This alignment indicates the presence of a Kerker anapole—an optical state with potential implications for overcoming current limitations in optical devices related to inefficient coupling and light directionality. This study sheds light on a fascinating optical phenomenon and its potential applications in addressing challenges faced by existing optical devices.

COMPUTATIONAL MODEL FOR STUDYING THE TOPOLOGICAL INFLUENCE ON NEURONAL SYNCHRONIZATION

Presenter(s): Herbert, Carter, Undergraduate, Physics
De Oliveira, Jonas, Graduate, Physics

Mentor: Dr. Epaminondas Rosa Jr.

Co-Mentor: Dr. Rosangela Follmann

Authorship: Carter Herbert, Jonas De Oliveira, Rosangela Follmann, Celso Abud, Elbert Macau,
Epaminondas Rosa

Epilepsy is the most common neurological disorder affecting about 50 million people worldwide, according to the World Health Organization. It arises from abnormal synchronous electrical activity in the brain caused by a range of conditions including congenital abnormalities, genetics, oxygen deprivation, and temperature dysregulation, usually accompanied by fainting. In addition, seventy percent of patients living with epilepsy could have a better quality of life and live seizure-free if properly diagnosed and treated. With that in mind, we create a complex neuronal network aiming at investigating specific areas of the cerebral cortex possibly implicated in modulation of the dynamics of synchronization associated with epilepsy. We employ the Kuramoto phase oscillator model to control the dynamics between the different cortical regions to investigate the onset of synchronization. We use the Hypertext-Induced Topic Search (HITS) algorithm originally developed to rank internet pages to identify the most influential nodes in the cortex network. The results obtained consider one scenario using the original network, and two other scenarios in which we consider a disturbance to simulate the action of an antiepileptic drug. The disturbance reduced the intensity of connections of a group containing random nodes and the group with nodes chosen by the HITS algorithm by 50%. We analyzed the synchronization curves for the three scenarios, noticing that the set of nodes derived from the HITS algorithms presented a major suppression of synchronization when compared to the original network and the random set. This preliminary result using a relatively simple mathematical model may enhance our understanding of topological influence on seizures and how to deter synchronous behavior in the brain. For future works, we aim to investigate the neural network using more sophisticated and realistic dynamics given by a Hodgkin-Huxley-type neuron and to approach how temperature effects can trigger epilepsy.

INVESTIGATION OF THE EFFECTIVENESS OF NON-TRADITIONAL ELECTRIC FIELD DIAGRAMS

Presenter(s): Nevin, Miranda, Undergraduate, Teaching and Learning
Jose Marquez, Undergraduate, Teaching and Learning

Mentor: Dr. Raymond Zich, Physics

Many students report difficulties interpreting electric field diagrams. This study investigated the effect of non-traditional electric field diagrams on student comprehension. Modified diagrams were created where the thickness of the electric field lines corresponds to the magnitude of the electric field. Other diagrams emphasized the direction of the electric field. Students enrolled in an introductory electricity and magnetism course were presented traditional and modified diagrams and asked to identify field strength and direction. Results when students are asked E-field magnitude questions on diagrams emphasizing magnitude and direction questions on diagrams emphasizing direction, showed higher correctness rates than with traditional electric field diagrams. A follow-up study with randomized presentation order of traditional and non-traditional electric field diagrams and swapped question content showed correctness rate did not depend on order of diagram type and improved correctness rate when direction questions were asked about magnitude diagrams and magnitude questions about direction diagrams.

NANOMATERIALS PATTERNING INVOLVING UNDERGRADUATES AT ILLINOIS STATE UNIVERSITY

Presenter(s): Nichols, Lane, Undergraduate, Physics
De Gante, Gabby, Undergraduate, Physics
Mentor: Dr. Mahua Biswas
Authorship: Lane Nichols, Carter Herbert, Gabby De Gante, Sudarshana Patra, Mahua Biswas,
Uttam Manna

The fabrication of nanoscale structures and studying their science is the key point for the innovation of new emerging technologies in different fields. The use of nanomaterials for the fabrication of different optical, magnetic, chemical, biomedical, and microelectronics devices has received tremendous attention because of lower power consumption, faster response, and higher performances. Due to the small size and precision necessary to make these devices, making nanomaterials with a tunable structure, size, and composition is critical. In our experimental physics laboratory at Illinois State University, we use block copolymers (BCPs) as templates in a process called sequential infiltration synthesis (SIS) to fabricate nanostructures with different morphology by selectively infiltrating inorganic material inside a patterned polymer. BCPs are a special type of polymer with self-assembling properties to create nanopatterns of different characteristics which can be tuned by adjusting the properties of BCPs such as molecular weight and volume fraction. During our study, we have explored a variety of BCPs for the use of SIS, including poly(styrene-*b*-methylmethacrylate) (PS-*b*-PMMA) and polystyrene-*block*-poly(α -caprolactone) (PS-*b*-PCL). In our lab, using these nanostructures of BCP as guiding patterns we fabricate nanopatterns of various inorganic materials such as aluminum oxide (Al₂O₃), silicon dioxide (SiO₂), and aluminum nitrides (AlN). We characterize these nanopatterned structures using scanning electron microscope (SEM), Energy-dispersive X-ray spectroscopy (EDX), and Fourier Transform infrared spectroscopy (FTIR). In our presentation, we will discuss the fabrication process of nanomaterials using BCP and SIS and will show the structural and physical properties of the fabricated nanostructures.

NITRIDE NANOPATTERNING FOR OPTOELECTRONIC ADVANCEMENTS

Presenter(s): Patra, Sudarshana, Graduate, Chemistry

Mentor: Dr. Mahua Biswas, Physics

Co-mentor: Dr. Uttam Manna, Physics

Authorship: Sudarshana Patra

Nanopatterning of inorganic materials is an emerging field with a wide range of applications such as optoelectronics, photonics, energy, and biomedical engineering. Group III nitride materials particularly Gallium Nitride (GaN) and Aluminum Nitride (AlN), are noteworthy due to their exceptionally wide bandgaps, enabling emissions across the ultraviolet (UV) and visible spectrum. Nitride-based planar structures are commonly used for blue LEDs and recently nanostructures have gained attention for growth on low-cost dissimilar substrates, better light extraction properties, and carrier confinement. Nitride material growth is challenging due to high-temperature requirements and lattice mismatch with conventional substrates. We used Sequential Infiltration Synthesis (SIS) to develop nanopatterns of AlN, allowing for scalable and well-ordered growth of patterned nanomaterials. We have used polystyrene-b-polymethylmethacrylate (PS-b-PMMA) self-assembled nanostructures as a guiding pattern. We analyzed the nitride patterns using Scanning electron microscopy and Fourier transform infrared spectroscopy. Nanopatterning nitride materials with SIS could lead to new, cost-effective substrate-independent nitride-based optoelectronic device applications.

COLLOIDAL SYNTHESIS OF HIGH REFRACTIVE INDEX SILICON NANOPARTICLES

Presenter(s): Sarwara, Prachi, Graduate, Chemistry
Mentor: Dr. Uttam Manna
Co-Mentor: Dr. Biswas Mahua
Authorship: Prachi Sarwara, Sudarshana Patra, Robert Sevik , Uttam Manna,[†], Mahua Biswas^{*}

High refractive index dielectric nanoparticles (index of refraction, $n > 3$) have proven to be a great advancement over plasmonic nanoparticles due to their less dissipative losses and ability to achieve large resonant enhancement of both electric and magnetic near-fields. Silicon, being a high refractive index material, shows stronger magnetic resonances and, therefore, offers the opportunity to enhance magnetic-light-matter interactions at the nanoscale. In our Nano-chemistry Lab at ISU, we have synthesized spherical Si nanoparticles with dimensions ranging from 100-200nm using a high-temperature fabrication method. The process starts with annealing in the furnace, which results in the conversion of SiO to Si embedded in SiO₂. It is followed by a hydrofluoric acid etching process to separate the Si nanoparticles and then wash them with water. The final result is Si nanoparticles dispersed in water. The size and optical properties of the sample were determined by a combination of scanning electron microscopy and UV-VIS spectroscopy. Currently, we are working on preparing solutions of monodispersed particles using the sucrose density gradient method. The synthesized colloidal solutions of nanoparticles will be utilized for optical trapping and manipulation and the demonstration of electromagnetic duality in our laboratory.

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POLITICS AND GOVERNMENT

ASSESSING THE IMPACT OF WATER SALINITY ON WOMEN'S HEALTH IN COASTAL AREAS: AN ANALYSIS BASED ON THE RIGHT TO WATER AND SANITATION

Presenter(s): Ahsan, Md Imran, Graduate, Politics and Government

Mentor: Prof. Dr. Noha Shawki

Authorship: Md Imran Ahsan, Suriya Akter

This paper critically examines the human rights situations of women in coastal areas of Bangladesh with a special focus on the harmful effects of water salinity on health. Coastal areas in Bangladesh are particularly susceptible to climate change-induced challenges, including salinization of water sources. Our analysis investigates the intersectionality of environmental degradation and human rights, emphasizing the disproportionate impact on women's health.

Based on the human rights framework, our study explores how saline water worsens existing inequalities, limiting women's access to clean drinking water, adequate sanitation facilities, and essential healthcare services. By centering human rights principles, we highlight the interconnectedness between environmental degradation and violations of women's rights to water and sanitation, emphasizing the right to health, and safe living conditions.

As Bangladesh struggles with escalating sea-level rise, with projections indicating a substantial increase by 2100, the prevalence of water salinity poses a grave threat to coastal communities' well-being and rights. About 73 percent of the population is deprived of drinking water in coastal areas (BEDS, 2020). About 20 million people have already faced the crisis of drinking water in the salinity areas of Bangladesh (World Bank, 2020). Our analysis underscores the urgent need for comprehensive interventions that address this issue's human rights dimensions.

While existing research has studied various health consequences of water salinity, our study fills a gap by focusing on the violations of human rights—the right to water and sanitation. Coastal women disproportionately bear the burden of water salinity and face heightened risks due to their reliance on contaminated water sources for daily activities.

By highlighting the right to water and sanitation principles, our analysis provides valuable insights for policymakers, advocates, and practitioners to develop inclusive and rights-based strategies aimed at mitigating the adverse effects of water salinity on women's health and well-being in coastal regions.

NAVIGATING CHANGE: THE EVOLVING PATTERNS OF CHILD, EARLY AND FORCED MARRIAGE NORMS

Presenter(s): Barua, Proma, Graduate, Politics and Government

Mentor: Dr. Noha Shawki

Child, early and forced marriage (CEFM), which constitutes a form of gender-based violation, is an extremely serious issue. The United Nations Children's Fund reports that every year approximately 12 million girls worldwide enter marriage before reaching the age of 18. According to Girls Not Brides, an organization dedicated to ending child marriage, one in five girls globally get married before they turn 18. The World Bank has projected that there are currently more than 650 million women who were married during their childhood. Child marriage is still common in many countries, despite international agreements like the Convention on the Rights of the Child, The Universal Declaration of Human Rights, and Convention on the Elimination of All Forms of Discrimination Against Women. In this paper, I use a constructivist approach to explain how child marriage norms have evolved to define child marriage as a violation of human rights. I employ the framework put forward by Finnemore and Sikkink, which comprises three separate stages that define the lifespan of norms. The steps encompassed in this process are the norm emergence stage, the norm cascade stage, and the norm internalization stage. I address the following questions in this study: Is there ongoing change in child, early and forced marriage norms? Which stage of the norm cycle are they currently in? Data from the United Nations General Assembly, Girls Not Brides, the Human Rights Council, and other sources are used to explore these questions. I find that the norms pertaining to child, early and forced marriage are evolving and are currently in the second phase of the norm evolution process.

HUMAN RIGHTS AND DEMOCRATIZATION: THE ROLE OF THE UNIVERSAL PERIODIC REVIEW

Presenter(s): Henrichsmeyer, Allison, Undergraduate, Politics and Government

Mentor: Dr. Noha Shawki

Authorship: Allison Henrichsmeyer

The Universal Periodic Review (UPR) is a mechanism under the umbrella of the United Nations (UN) Human Rights Council (HRC) that encourages compliance with international human rights law and provides accountability for individual states in that area. However, because the authority of the UN does not supersede state sovereignty, the UPR's authority, by extension, is not universal in practice. This study will provide a window into the UPR's effectiveness by examining its results and effects in Senegal. Before diving into the case study, it is important to understand the institutional and legal framework that forms the foundation for the UPR, which is what the first section will focus on. The literature review then provides an overview of previous works assessing the UPR's effectiveness and what factors play a role throughout the process. After establishing that background, the three cycles of the UPR in Senegal are discussed through the lens of several prevalent human rights issues in the country. Ultimately, the study concludes that despite ongoing challenges that limit the UPR's ability to ensure immediate, concrete change in national human rights compliance, it remains an effective tool of accountability within the international community and will only grow in its legitimacy and effectiveness in the future.

HOW POLITICAL INTEREST SHAPES BELIEFS ABOUT CORRUPTION

Presenter(s): Johnson, Zachary, Undergraduate, Politics and Government

Mentor: Dr. Kerri Milita

Americans have widely different perceptions about corruption in government. In this study, I examine how an individual's political interest affects how severe they perceive government corruption to be. I propose that political interest has a non-linear relationship with beliefs about corruption. At the low end of political interest, individuals are unlikely to engage with news media coverage of corruption. On the other end, at high levels of political interest, individuals are unlikely to have any major change in perceptions of corruption based on media coverage. Those with moderate level interest may be most susceptible to media and campaign rhetoric related to corruption, and should be more likely to have cynical feelings about government.

GENERATIVE AI'S RISK OF COPYRIGHT INFRINGEMENT AND ITS POTENTIAL INTELLECTUAL PROPERTY RIGHTS

Presenter(s): O'Dowd, Sara, Undergraduate, Politics and Government

Mentor: Prof. Calli Farrell

Co-Mentor: Prof. Thomas McClure

Authorship: Sara O'Dowd

Technology has always been a powerful force, in recent years, that force has grown in leaps and bounds. Now, generative AI can produce creative content, a task previously that required a human mind to do, going as far as to sometimes produce work in the styles of specific artists. This raises multiple worries, including if these program's ability to produce such content violates the intellectual property rights of artists, as well as who claims the intellectual property rights for AI generated works. This study explores generative AI's potential to infringe on copyright, generative AI's theoretical ability to claim intellectual property rights based on the philosophical framework the rights stem from, and the common law thus far established.

U.S. INVASION OF AFGHANISTAN: A CRITICAL ANALYSIS OF AMERICAN SOUTH ASIAN POLICY

Presenter(s): Tasdan, Kerem, Undergraduate, Politics and Government

Mentor: Dr. Ali Riaz

Authorship: Kerem Tasdan

This study will offer a critical analysis of U.S. foreign policy in South Asia specifically centered around America's invasion of Afghanistan in 2001 and its aftereffects. The 2001 Invasion of Afghanistan was a pivotal moment not only in the geopolitical landscape of the nation of Afghanistan but also in shaping the outline of American foreign policy in the broader South Asia region. This study embarks on a critical examination of the multifaceted repercussions stemming from the U.S. intervention in Afghanistan, analyzing its profound impact on the destabilization of Afghanistan itself and its intricate ramifications on the broader South Asian geopolitical dynamics. Additionally, this study delves into how the invasion inadvertently contributed to the erosion of America's reliability and credibility as a beacon of democracy and stability in international relations. By analyzing the impacts of this pivotal invasion, this study reveals the interconnectedness between the aftermath of the invasion of Afghanistan and wider failed U.S. South Asia policy, arguing that both phenomena are ultimately tied to challenges that have strained America's diplomatic standing in the region. The results of this analysis suggest that the U.S. can form more consistent foreign policy in South Asia through genuine strengthening of multilateral relations, leveraging the beneficial aspects of international institutions, and fostering meaningful economic development goals tailored to the needs of the individual nations.

PSYCHOLOGY

FIRST-GENERATION COLLEGE STUDENTS' PERCEPTION OF LEARNING

Presenter(s): Alvarado, Giselle, Undergraduate, Psychology

Mentor: Dr. Dawn McBride

Authorship: Giselle Alvarado

The purpose of this research study is to investigate how first-generation college students perceive their learning compared to non-first-generation students. I plan to sample from the PSY 231 students in the Spring 2024 semester. Students will participate in a survey that will measure student's perceptions of learning based on three separate variables: confidence level, preparedness, and positive affectivity (how positively they view their learning). In this survey, students will be given multiple statements and be asked to rate how much they agree with these statements using a 5-point Likert scale. Later in the semester, I will look at participants' actual grade on a Unit Exam to compare their perception of learning with their actual performance in the PSY 231 course. I expect the first-generation students to have significantly lower ratings than students who are not first-generation students. These findings will hopefully confirm my hypothesis that first-generation students perceive their learning more negatively overall and are less confident and prepared. I also hypothesize that first-generation students and non-first-generation students will show significant differences in grades.

INVESTIGATING THE EFFECT OF TASK TYPE AND DELAY ON PROSPECTIVE MEMORY

Presenter(s): Caruso, Dante, Graduate, Psychology
Curescu, Clarissa, Undergraduate, Psychology
Liew, Ryan, Graduate, Psychology

Mentor: Dr. Dawn McBride, Psychology

Authorship: Dante Caruso, Clarissa Curescu, Ryan Liew

Prospective memory (PM) describes our ability to remember the information necessary for completing a future task. PM tasks are generally divided into two categories: time-based PM tasks and event-based PM tasks. Time-based tasks are either scheduled for a particular time in the future or are to be performed after a certain time interval has passed, whereas event-based tasks are to be completed when an external event occurs. In the current experiment, participants were asked to send a text message to the researchers either at a particular time in the future (time-based) or in response to a text received from the researcher (event-based). Target response times were 1 day, 3 day, or 6 days after the initial session. Our results showed that as the delay increased, the participant's task completion rate declined for both the time-based and event-based conditions. We also found that participants in the event-based conditions completed their PM task at a significantly higher rate than participants in the time-based conditions. Research has shown that most people tend to plan future tasks almost exclusively as time-based tasks, but our results suggest that people may be more likely to complete their prospective memory tasks if they plan them as event-based tasks rather than time-based ones.

CAN VIDEO COMPARISON FACILITATE CHILDREN'S STEM LEARNING?

Presenter(s): Cripe, Jada, Undergraduate, Psychology

Mentor: Dr. Alycia Hund

Co-Mentor: Alexis Colwell

Authorship: Jada Cripe, Alycia Hund

Embracing STEM (Science, Technology, Engineering and Mathematics) learning is paramount for young children as it fosters critical thinking, problem solving, and a curiosity-driven mindset. This not only equips them for future technological progress but also encourages a deeper understanding of the world around them. The purpose of this study was to assess the efficacy of a video-based comparison in instructing 54 6- and 7-year-old children about the role of a diagonal brace in providing stability within a structure—a fundamental engineering concept. Children were divided between three different conditions: Comparison, Single Model, and No Training. Children in the comparison group were presented with a video of two metal towers (one diagonally braced, one horizontally braced). The researcher in the video demonstrated the stability of both towers by pushing on them. Children placed in the Single Model condition viewed one video of the stable tower pushed by the researcher.

Following the video, participants of the Comparison and Single Model group were asked to describe what made the diagonally braced structure solid. Children in the No Training condition saw no video and were not asked to form an explanation. All groups participated in a relational reasoning task, a transfer task, and a mental transformation task following this.

Parents of participants were asked to fill out a questionnaire about their child's interest in STEM concepts and spatial language. It was hypothesized that children in the comparison group would apply more brace-based explanations than children in the Single Model group and the No Training group. The hypothesis was not supported by the data collected. It was further hypothesized that children in the comparison group would perform better on the Transfer Task than that of the Single Model group. This hypothesis was not supported. Lastly, it was hypothesized that all three tasks were going to be positively correlated between an interest in STEM and parent reported spatial language use. This was found to be partially supported by the data, and there was a positive correlation found between spatial language and brace-based explanations within the transfer task. Ultimately, the study aimed to highlight the importance of spatial language and STEM learning in a virtual format and provided a basis for further research to be conducted on this topic in the future

EVALUATING THE EFFECTIVENESS OF MULTIPLE READING COMPREHENSION INTERVENTIONS USING MEASURES OF LEARNING SPEED: A BRIEF EXPERIMENTAL ANALYSIS

Presenter(s): Daly, Evan, Graduate, Psychology

Mentor: Dr. Gary Cates

Authorship: Evan Daly, Andrea Smith, Danielle Gesell, Stephanie Guo, Kathleen Shields, Meredith Spraggon, Gary Cates

Brief experimental analyses were conducted to evaluate the effectiveness of multiple reading comprehension interventions. Specifically, changes in comprehension accuracy from pre to post test and measures of learning speed were obtained for two middle school students. The interventions included question preview and a combined condition with question preview, click or clunk, and repeated reading. Results indicate the combined condition resulted in a larger increase in comprehension accuracy and more instructional time when compared to the question preview condition. Discussion focuses on using measures of learning speeds to evaluate interventions, limitations, and directions for future research.

ATTENDANCE AND ONLINE/IN-PERSON EXAMS

Presenter(s): Del Valle, Ivellisse, Graduate, Psychology

Mentor: Dr. Dan Ispas

Authorship: Ivellisse Del Valle, Taylor Flinn, Alexandra Ilie, Dan Ispas, Dan Lannin

A. Purpose:

Class attendance is one of the strongest predictors of grades (Crede et al., 2010). Attendance offers opportunities for distributed practice which is linked with increased retention (Cepeda et al., 2006). However, most of the research on the relationship between attendance and grades was conducted in traditional classrooms with in-person exams with very few studies examining actual attendance policies (Crede et al., 2010). During the Covid-19 pandemic, universities have made the switch to online exams. While a lot of universities have returned to in-person teaching, online and hybrid options remain popular with students (Morrison, 2022) and are common offerings for universities. The purpose of this study is to examine the impact of an attendance policy on both online exams and in-person exams using a quasi-experimental design rarely used when examining the relationship between attendance and academic performance (Crede et al., 2010).

B. Procedure:

The data was collected across two semesters in an introductory statistics class at a large Midwestern university. In the second semester, an attendance policy was implemented which required students to attend at least 20 lab sessions in order to achieve the maximum points for attendance in class. Data on exams was retrieved from the online course management platform at the end of the semester. The exams administered were identical across both semesters.

C. Results:

Exams 1 and 2 were both online exams during both semesters. The SPSS Exam was in person during both semesters. There were no statistically significant differences between the two semesters on the two online exams: Exam 1 and 2. The SPSS Exam showed a statistically significant difference with Semester 2 students (the semester with attendance policy) scoring higher: $t = -2.59$, $p < .01$, $d = -.39$. The full results are presented in Table 1.

While not a focus of this analysis, we do note that within the attendance semester ($n = 95$) we found a correlation of $r(93) = .52$, $p < .001$ between attendance scores and total points in the class.

D. Conclusions:

It appears that attendance is linked with improved exam performance only for in person exams not for online exams. We recommend additional research in this area to inform policy on attendance since hybrid and online classes are likely to remain popular.

WORKPLACE DISCRIMINATION OF IMMIGRANTS AND ACCENT-BASED MICROAGGRESSIONS

Presenter(s): Del Valle, Ivellisse, Graduate, Psychology

Mentor: Dr. Kimberly Schneider

Authorship: Ivellisse Del Valle

Purpose:

This study examined experiences of immigrant workers in the U.S. and links between workplace discrimination, harassment, accent-based microaggressions, and health. The Center for Immigration Studies classified 14.2% of the 2021 U.S. population as immigrants (Camarota & Zeigler, 2022) so their workplace experiences are critical to examine. Using Conservation of Resources theory (Hobfoll et al., 2000) and previous empirical evidence of correlates of racial harassment and discrimination (Bergman et al., 2007; Schneider et al., 2000), we predicted that accent-based microaggressions, years in the U.S., and perceived fluency would predict workplace racial discrimination and harassment, and that these would predict health correlates. We also predicted that accent-based microaggressions would contribute to the prediction of harassment and discrimination beyond the impact of fluency and years in the U.S.

Methodology:

A sample of 91 working adults who immigrated to the U.S. completed a voluntary online survey. Most participants were from either Latin America (30.8%) or Eastern Europe (29.7%) and had been in the U.S. an average of 12.83 years (SD = 10.40). The Health Satisfaction subscale of the Retirement Descriptive Index and the Health Conditions Index (Smith et al., 1969) were used to assess health correlates. Language fluency was assessed with the item, "How well do you feel you speak English?". The Racial Discrimination Scale (Bergman et al., 2007), the Ethnic Harassment Experiences scale (Schneider et al., 2000), and the Perceived Discrimination Based on Accent Scale (Wated & Sanchez, 2006) assessed discrimination, harassment, and microaggressions. Accent-based microaggressions include coworkers making jokes about one's accent or feeling pressured to eliminate one's accent.

Results:

Significant correlations were found between discrimination, microaggressions, harassment, and health correlates (see Table 1). Using multiple regression, we found that accent-based microaggressions and years in the U.S. significantly predicted discrimination and harassment with accent-based microaggressions as the best predictor, explaining significant variance beyond fluency and years in the U.S. (see Table 2).

Implications:

Accent-based microaggressions and years in the U.S. were related to ethnic harassment at work; perceptions of one's fluency did not significantly predict these experiences. Accent-based microaggressions were also related to health correlates, with a negative relationship with health satisfaction and a positive relationship with health symptoms. These results emphasize how discrimination negatively impacts immigrant workers' well-being, particularly for individuals who have been in the U.S. longer and are the targets of microaggressions at work related to their accents.

HOW WE THINK CHANGES WHAT WE REMEMBER: THE ROLE OF ENCODING STRATEGIES ON CREATING FALSE MEMORIES

Presenter(s): Dow, Michael, Graduate, Psychology

Mentor: Dr. Dawn McBride

Authorship: Michael Dow

The current study was designed as a replication and extension of Coane et al.'s (2020) feature boost effect, using a list-learning paradigm to create simple false memories for words related to the studied lists. Coane et al. (2020) found that taxonomically-related lists increase false memories when compared to other lists without this taxonomic relation; they called this a "feature boost." In the current study, we examined the effect of encoding instruction (item-specific vs. relational encoding) on the feature boost effect. Huff and Bodner (2013) found that with non-taxonomic lists, item-specific encoding reduced source-monitoring errors and reduced false memories, and relational encoding increased source-monitoring errors and increased false memories. In the present experiment, three encoding conditions are being tested: instructions for simply reading the words (control) or instructions focusing encoding on item-specific or relational information about the words in the lists. All participants will view both taxonomic and non-taxonomic related lists and then be given an old-new long-term recognition test. The expected results are that relational encoding will increase the feature boost effect relative to the control condition and item-specific processing will decrease the effect relative to the control condition.

PERFECTIONISM AND SUBSTANCE USE AMONG COLLEGE STUDENTS: INVESTIGATING THE MEDIATING ROLE OF EMOTION DYSREGULATION

Presenter(s): Duong, Michelle, Graduate, Psychology

Mentor: Dr. Laura Finan

Authorship: Michelle Duong, Laura Finan, Suejung Han

We investigate relations among perfectionism, emotion dysregulation, and substance use outcomes (alcohol and cannabis) among college students. Specifically, we examine if perfectionism dimensions (strivings and concerns) are related to substance use and if this relationship via emotion dysregulation. Findings will provide insight into the personality- emotional-behavior interrelations among college students' lives.

COGNITIVE REFLECTION TESTS AND ACADEMIC PERFORMANCE

Presenter(s): Flinn, Taylor, Graduate, Psychology
Mentor: Dr. Dan Ispas
Authorship: Flinn, T., Ilie, A., Ispas, D., Schneider, K., Iliescu, D.

A. Purpose

Dual processing theories (e.g., Exans & Stanovich, 2013) posit the existence of two types of processing when dealing with a situation: Type 1 (fast, intuitive) and Type 2 (effortful, reflective). Humans are more likely to use Type 1 processing (we are more likely to be cognitive misers). There are differences in these tendencies and cognitive reflection tests (CRTs, Frederick, 2005) have been developed to measure individual differences in miserly tendency (Toplak et al., 2014). However, not much is known about the relationship between CRTs and academic performance. The goals of the current study are to examine and compare the criterion-related validity of numerical and verbal CRTs, and to explore the incremental validity of CRTs over personality and cognitive ability.

B. Procedure

We are in the process of conducting a cross-lagged study with undergraduate participants enrolled in two Statistics courses (approximately 210 students) at a Midwestern university. At Time 1 (Data Collection Completed - September 2023), participants filled out measures of CRTs, personality, cognitive ability, and demographics. At Time 2, in December 2023 we will retrieve their academic performance indicators from the course records. We used two CRTs: the Numerical CRT (Toplak et al. 2014) and the Verbal CRT (Sirota et al., 2021). Personality (Big Five) was measured with the 60-item BFI-2 (Soto & John, 2017). Cognitive Ability was measured by proxy using the students' ACT scores (Koenig et al., 2008). Academic Performance will be conceptualized as the students' Total Points in the class and their Final Exam Scores, both will be retrieved from course records in December 2023.

C. Results

We will be examining the correlations between each CRT, personality traits, cognitive ability, and the indicators of academic performance. Additionally, we will examine the incremental validity of each CRTs over personality and ACT scores. We will also conduct a relative weights analysis. We will run these analyses in December 2023 as soon as the semester ends, and we will be having access to the students' final exam and total points in their courses. The study will be fully completed by January 2024.

D. Conclusion

Our study will help clarify the role of CRTs as an individual difference and the relationship between verbal and numerical CRTs and academic performance.

SUPPORTING EDUCATOR WELLBEING AND RETENTION THROUGH COLLABORATIVE ACTION RESEARCH

Presenter(s): Garcia, Andrea, Graduate, Psychology

Mentor: Dr. Adena Meyers

Educator attrition has increased in recent years, especially within school districts characterized by high needs. High stress levels, job dissatisfaction, organizational instability, difficulties in managing student behavior, and increased demands are among factors contributing to educator burnout and, in some cases, abandonment of the profession (Brasfield et al., 2019; Herman et al., 2017). The present study highlights the findings of a Participatory Action Research (PAR—see Chevalier & Bickles, 2019) project in which university and district administrators collaborated to inform program development aimed at supporting staff wellbeing. A survey containing items related to turnover intentions, burnout, interest in wellness programming at the individual, interpersonal, school, and district/community levels was distributed to assess staff's overall well-being, needs, and interest in wellness programs. Based on the responses provided by 254 participants, results indicated only a modest interest in district-sponsored wellness programming while the highest interest was related to school-level factors. Across the district, educators reported high turnover intentions and open-ended responses overwhelmingly indicated respondents believed wellness programming should be optional. Although these data are geared toward developing interventions to address school-level needs in supporting teacher wellness within a specific district, these data build upon prior research indicating that remedying educator attrition and uplifting wellness requires a multi- component strategy where educator voices are amplified and considered in the planning process.

THE POSSIBLE EFFECT'S OF VIDEO-GAMES ON STRESS AND ANXIETY

Presenter(s): Goodman, Trevor, Graduate, Psychology

Mentor: Dr. Suejung Han

Purpose:

Research has shown that video game playing can decrease stress. For example, Rupp and colleagues (2017) found that video games slightly decreased worry and distress after bouts of vigilance. Importantly, one study examined different dimensions of video game playing experiences such as enjoyment, immersion (i.e., losing track of time when playing), and self- efficacy (Langer & Sanchez, 2019). The results showed that people who played the games for enjoyment performed better, compared to their other group that was playing games for educational purposes. However, these aspects of game playing have not been examined in relation to stress reduction among college students. I hypothesize that (a) video game playing will decrease felt stress and that (b) such stress reduction will be associated with felt enjoyment, felt immersion, and perceived self- efficacy.

Procedure: Participants were 49 college students (9 men, 40 women, 0 non-binary, mean age = 18.6) enrolled in a Midwestern university and have been recruited through the Psychology Department SONA system for research participation credits.

After giving informed consent, participants took a pre-survey online using their device, were given multiple choices of games to play, played one of their choice for 15 to 20 minutes, and then completed the post-survey. Both surveys include a modified Perceived stress scale (Cohen et al., 1983), Positive and Negative Affect Schedule scale (Watson et al., 1988), and a modified Video Game Pursuit Scale (Langer & Sanchez, 2019).

Results: The paired samples T-tests showed that stress decreased significantly after playing video games with a medium effect size ($t = 2.98$, $p = .05$, $\text{cohen's } d = .435$) Negative emotions also significantly decreased after playing video games with a large effect size ($t = 5.94$, $p < .001$, $\text{cohen's } d = .866$) . Linear regressions analyses with changes in stress, positive emotions, and negative emotions as dependent variables and gaming experiences as independent variables revealed no significant results, except that feeling immersed during the game predicted increase in positive emotions significantly ($\beta = .694$, $p < .001$).

Implications:

The findings of this study do show that playing video games have a positive effect on people both in the decrease of stress as well as a decrease in negative emotions. As no gaming dimensions explained stress reduction, future research should examine why and how such stress reduction occurs after playing videogames.

RACIAL AND ETHNIC DEMOGRAPHIC REPRESENTATION IN CAREGIVER INVOLVEMENT RESEARCH

Presenter(s): Guo, Stephanie, Graduate, Psychology

Mentor: Dr. Shengtian Wu

Students from minoritized backgrounds are underrepresented in psychological research. As research informs practice in psychology, underrepresentation in research can result in the usage of culturally inappropriate assessment, intervention, and consultation practices for minoritized student populations. The current study aims to analyze the representation of students in the United States (U.S.) with minoritized racial and ethnic backgrounds in peer-reviewed school psychology research on caregiver involvement published in the *School Psychology* and *School Psychology Review* journals from 2013 to 2020. The study uses coded racial and ethnic demographic data from 18 empirical studies with a total of 15,565 child participants and compares the data to national K-12 student demographic reference data published by the National Center for Education Statistics (NCES). Results indicate that Asian, Latiné, Native American, and Pacific Islander students were represented significantly less than in the reference data, Black and multiethnic students were represented significantly more than in the reference data, and white students were not significantly represented differently compared to the reference data. These results emphasize ongoing concerns related to underrepresentation in school psychology research and highlight the need for greater representation of individuals from several racial and ethnic backgrounds in research regarding caregiver involvement in school-based services.

PRELIMINARY EFFECTIVENESS OF THE BODY PROJECT FOR HIGH SCHOOL STUDENTS

Presenter(s): Harrell, Ty, Undergraduate, Psychology
Meyer, Derek, Graduate, Psychology
Hoge, Maxine, Undergraduate, Psychology
Walsh, Matt, Undergraduate, Psychology
Loer, Jacob, Undergraduate, Psychology
Mentor: Dr. Suejung Han
Authorship: Ty Harrell, Derek Meyer, Maxine Hoge, Matthew Walsh, Jacob Loer, Suejung Han

This study examines the preliminary effectiveness of an adapted gender-inclusive version of the Body Project, an eating disorder prevention program, for high school students. The original Body Project (Stice et al., 2008) was developed for college-aged women mostly and for college men recently. We aimed to offer the program (a) for high school students given that body image concerns may peak during adolescence (e.g., Toselli et al., 2023) and (b) for all men, women, and transgender and non-gender conforming (TGNC) students given that TGNC students report an increased level of body image concerns (e.g., Richburg & Stewart, 2022). Extensive literature has shown its efficacy among college women and men in preventing the onset of eating disorders and decreasing negative mood, body dissatisfaction, and self-esteem contingency upon body weight and shape (Stice et al., 2008) as well as for high school girls (e.g., Stice et al., 2009). However, no studies have examined its gender-inclusive version for high school students. We hypothesized that the levels of disordered eating behaviors, self-esteem contingency on body shape and weight, and body satisfaction would decrease after program completion. Students' perceptions of helpful aspects of the program were also explored.

This study was advertised at a local high school that is affiliated with the university of the authors. The study was approved by the IRB and high school administration. The program's implementation (four weekly 1-hour sessions, $n=6$) was sponsored by two teachers. With parental consent and student assent, a pre-survey was administered, followed by the first session. The first two program implementations were facilitated by trained undergraduate researchers (i.e., the first four authors) with another implementation planned to occur before the symposium. After the fourth session, a post-survey was distributed. Both surveys include the Eating Disorder Diagnostic Questionnaire (Fairburn & Beglin, 2008), Ideal-Body Stereotype Scale-Revised (Stice, Fisher, & Martinez, 2004), Satisfaction and Dissatisfaction with Body Parts Scale (Berscheid, Walster, & Bohrnstedt, 1973), and demographic questions. The post-survey also includes open-ended questions about what participants found beneficial.

Due to the nature of the data collection, the current sample size ($n=6$) did not allow for pre- and post-program mean comparisons on the dependent variables, but descriptive data suggests a trend toward positive outcomes indicating the benefits of a gender-inclusive version. Students reported appreciation for group solidarity and open discussion. Future research could examine these as mediating mechanisms for changes.

EXPECTATIONS AND ANXIETY: EXPLORING THE EFFECTS OF EXPECTATIONS ON COGNITIVE AND SOMATIC ANXIETY EXPERIENCES

Presenter(s): Jeronimus, Joy, Graduate, Psychology

Mentor: Dr. Kelly Clemens

Response expectancies are anticipations of one's own automatic reactions (Kirsch, 1985) and have been shown to influence subsequent anxiety experiences. The present study aims to better understand how response expectancies differentially influence the somatic and cognitive dimensions of anxiety. 201 participants from the general population were recruited using the Prolific participant recruitment system and were randomized to one of two expectation conditions: anxiety expectation or control. Participants ($N=201$, $M_{age} = 41.67$, $SD=14.76$) indicated their expectations for somatic and cognitive anxiety before watching a brief anxiety-provoking video. Finally, participants completed measures of experienced somatic and cognitive anxiety. It is hypothesized that individuals in the anxiety expectation condition will experience higher levels of somatic, but not cognitive, anxiety than those in the control condition. Results of an independent sample t-test of cognitive anxiety experienced showed for the anxiety expectation ($M= 1.82$, $SD= .81$) and control group ($M=1.82$, $SD=.70$), significance $t(199)= 2.365$, $p=.010$. Expectations were also a predictor of experienced anxiety $F(1,99)= 55.825$, $p<.001$, $R^2=.219$. Better understanding the influence of response expectancy on different dimensions of anxiety may help to inform when expectancy plays a role in anxiety experiences, which in turn may begin to provide guidance for how interventions might be personalized to best address individuals' symptoms.

DO PROBING DYNAMICS DIFFER WHEN PERCEIVING DIFFERENT PROPERTIES OF THE PROBE-SURFACE SYSTEM?

Presenter(s): Kashyap, Arghya, Graduate, Psychology
Blankson, Kwesi, Undergraduate, Psychology

Mentor: Dr. Jeffrey Wagman

Co-Mentor: Dr. Alen Hajnal

Authorship: Arghya Kashyap, Kwesi Blankson, Alen Hajnal, Jeffrey Wagman

People use different exploratory movements to perceive different properties of a hand-held object and different exploratory wielding movements to perceive different properties of a wielded object. In two experiments, we investigated whether people use different exploratory probing movements to perceive different properties of a probe-surface system. In the first experiment, participants probed a surface and attempted to perceive either the length of the probe or the distance of the probed surface. Participants were able to differentiate these two properties, but there was no difference in the complexity of the exploratory probing movements (as quantified by effort-to-compress, ETC). In a second experiment, participants probed a surface and attempted to perceive either an affordance (whether they could stand on that surface) or a geometric property (angle of inclination) of that surface. Given that previous research has shown differences in the complexity of exploratory postural movements when visually perceiving these two properties of a surface, we expect to find differences in the complexity of the exploratory probing dynamics across conditions in this experiment. The results will be discussed in terms of the reciprocity of perceiving and acting and the fundamental difference between perceiving affordances and geometric properties.

CONTEXT OF COLLEGE STUDENTS' ALCOHOL AND OTHER SUBSTANCE CO-USE: A QUALITATIVE ANALYSIS

Presenter(s): Kuhn, Rory, Undergraduate, Psychology
Koerwitz, Anna, Undergraduate, Psychology
Mentor: Dr. Laura Finan
Authorship: Laura Finan, Anna Koerwitz, Rory Kuhn

Purpose

The prevalence of alcohol, tobacco, and other drug use in college students ranges from 41.3-69.8% (El Ansari et al. 2021). Notably, co-use of alcohol and other drug use can lead to serious repercussions such as various health concerns and decreased effectiveness of treatments for abuse disorders (El Ansari et al. 2021). As such, it is critical to evaluate what contexts lead to alcohol and other substance co-use so that preventative measures can be established. Previous research has mainly focused on how environmental, social, and situational contexts individually contribute to the individual use of substances in young adults in college (e.g., Lipperman-Kreda et al., 2018). However, there is a dearth of examining the interactions of these individual context characteristics that contribute to the co-use of substances. Therefore, we used semi-structured qualitative interviews with college students to investigate interactions among various context characteristics that are associated with alcohol and other substance co-use.

Procedure

College students (N=18; Mage=20.56, SD=2.01; 61% female) from a large Mid-Western University were invited to participate in a research study about their alcohol and other substance use. Interested participants completed an online screener questionnaire. Those who reported using alcohol and another substance at the same time (e.g., stimulants, cannabis, etc.) in the past two-weeks were contacted to participate in an interview. Semistructured interviews began with a pile sorting task designed to begin conversation. Next, participants were asked a series of open-ended questions (with probing for depth and clarification) about the social, location, situational, and affective elements of the contexts in which they used alcohol and another substance.

Results

When describing the context characteristics of co-use contexts, participants reported nine main interactions between the individual contexts: location-situational, social-situational, social-affect, social-location, social-affect-location, social-location-situational, affectsituational, affectlocation, and affect-social-situational (see Table 1). The location-situational (N=31) and social-situational (N=35) context interactions were found to be the most prevalent among the participants.

Conclusions

Research shows that co-use of alcohol and other substances is linked with adverse outcomes and the characteristics of the contexts where substance co-use occurs can impact use behavior. Findings from this study highlight the unique ways in which these context characteristics interact and contribute to the limited research in this area. Results may be important for prevention programming aimed at supporting college students' health and well-being and reducing engagement in health risk behaviors.

DIFFERENTIAL RELATIONS AMONG SUBTYPES OF CHILDHOOD MALTREATMENT, COMPONENTS OF EMOTION REGULATION, AND INTERNALIZING SYMPTOMS: A MEDIATION MODEL

Presenter(s): Lamansky, Taelor, Graduate, Psychology

Mentor: Dr. Laura Finan

Authorship: Taelor Lamansky, Laura Finan

Childhood maltreatment, emotion regulation, and internalizing symptoms have all been independently associated with one another (e.g., Gruhn & Compas, 2020; Sharratt et al., 2023). Further, emotion regulation has been supported as a mediator between experiences of childhood maltreatment and internalizing symptoms (e.g., Espeleta et al., 2018; Jennissen et al., 2016). However, the majority of research in this area relies on composite measures rather than parsing out distinct components of each variable to assess differential relations among them. The present study attempts to fill in gaps and provide insight into seeming inconsistencies revealed by previous research related to the mediating role of emotion regulation components in the associations between childhood maltreatment subtypes and internalizing symptoms.

The present study assessed differential relations among five subtypes of childhood maltreatment (i.e., physical, sexual, and emotional abuse; physical and emotional neglect), six domains of emotion dysregulation (i.e., lack of awareness, understanding, and acceptance of emotions; difficulties refraining from impulsive behavior and engaging in goal directed behavior when confronted with emotion; and having limited access to emotion regulation strategies perceived to be effective), and internalizing symptoms (i.e., depression, anxiety, and stress), all measured via self-report questionnaires.

Among 653 participants, SEM path analysis indicated that emotional abuse, sexual abuse, and physical neglect were all positively associated with internalizing symptoms; emotional neglect was negatively associated with internalizing symptoms; and physical abuse was not significantly associated with internalizing symptoms. Mediation analysis indicated that all components of emotion dysregulation except for lack of awareness and impulse control difficulties partially mediated the relations between childhood maltreatment and internalizing symptoms. Further, maltreatment subtypes displayed complicated patterns of differential associations in terms of significance, magnitude, and valence with components of emotion dysregulation.

Among the first of its kind, this study carries salient implications for related fields of research and practice. Results not only support the existence of differential associations among childhood maltreatment subtypes, components of emotion regulation, and internalizing symptoms, but also suggest that their relations may be more complex than anticipated. Consequently, there are ample directions for future research and sizable implications for the development of increasingly individualized and targeted therapeutic interventions for affected populations.

MEDIA REPRESENTATION (AND LACK OF) AS SOCIAL INCLUSION AND EXCLUSION

Presenter(s): Lim, Zhi Quan, Graduate, Psychology
Hicks, Travis, Graduate, Psychology

Mentor: Dr. Eric Wesselmann

Co-Mentor: Dr. Jordan Arellanes

Authorship: Zhi Quan Lim, Travis Hicks, Eric Wesselmann, and Jordan Arellanes

Media research typically focuses on the effects of positive versus negative depictions of individuals from different identity groups. Little research compares how media portrayal (or lack thereof) compares to interpersonal social inclusion/exclusion. We hypothesize that media representation can be experienced similarly to interpersonal forms of social inclusion, and a lack of representation can be experienced similarly to ostracism.

Across three studies, participants listed an identity category important to their self-concept, then engaged in an adapted autobiographical recall paradigm. In Study 1, participants were assigned randomly to one of three groups. Two groups were asked to recall a time when their identity category was either represented or absent in the media. Group three served as the control condition, writing about an unrelated event. Study 2 replaced the representation condition with a condition requiring some participants to recall a time when they experienced interpersonal exclusion. Study 3 combined the conditions of studies 1 and 2, and participants were randomly assigned to either the representation, absence, exclusion, or control groups.

Participants in all studies completed measures of perceived social value, feelings of being excluded, and basic psychological need satisfaction.

In Study 1, participants in the represented condition reported higher perceived value when they saw their identity group represented compared to participants from other conditions; there was no difference between the absence condition and control. Participants in the absent condition felt more excluded and had lower basic need satisfaction than participants from the other two conditions. In Study 2, participants in the exclusion condition reported feeling more excluded and less basic need satisfaction than participants from the other two conditions. In Study 3, the exclusion condition participants felt the most excluded, followed by absence condition participants, control condition participants, and finally positive representation participants.

The results of these studies were mixed. Positive Representation participants recalled feeling higher value and reported greater basic need satisfaction than participants from other conditions. While there was no significant difference in perceived value between participants in the absence and control conditions, exclusion condition participants felt significantly less basic need satisfaction across all studies than other groups, including those in the absent condition. Collectively, these data suggest there are some overlaps between the media representation and social exclusion literature, though there may be unique effects to each experience that need further exploration.

THE ROLE OF GENDER DIVERSITY IN BODY DISSATISFACTION AND DISORDERED EATING AMONG COLLEGE- AGED STUDENTS

Presenter(s): Meyer, Derek, Undergraduate, Psychology
Harrell, Ty, Undergraduate, Psychology

Mentor: Dr. Suejung Han

Authorship: Derek Meyer, Ty Harrell, Suejung Han

Disordered eating is associated with mortality (Iwajomo et al., 2021), and psychosocial functioning (Bohn et al., 2008). Eating disorder research has mainly focused on cisgender women (Thapliyal et al., 2018). However, in college aged samples, gender diverse people exhibit disordered eating behaviors at significantly higher levels than cisgender counterparts (Diemer et al., 2015). The present study examines how the feelings of distress that transgender and gender non-conforming (TGNC) people face relate to their eating behaviors. Given feelings of gender dysphoria and gender minority stress, TGNC people would experience heightened discomfort with their eating and body across multiple domains.

However, such lived experiences have not been examined at the phenomenological level. It is crucial to understand how the lived experience of TGNC people, in relation to their gender identity, impacts how they feel about their bodies and their interactions with food.

Snowball sampling will be used to recruit college students (N = 10) who self-identify as transgender or non-binary. After agreeing to participate by completing an informed consent form via an online survey, they will be asked to complete the Eating Disorder Examination- Questionnaire 6.0 (Fairburn & Beglin, 2008) providing descriptive data about their disordered eating behaviors online. They will then be interviewed via Zoom by the first author. In the semi-structured interview, participants will be asked questions designed to ascertain how their gender identity relates to their body and how they interact with food (e.g., “In what ways do you think your eating relates to your gender expression?”). Probing questions will be employed to further expand on certain topics that participants bring up organically. The Consensual Qualitative Research method (Hill & Knox, 2021) will be used to identify themes and codes from the interviews. Another trained student researcher will be recruited for the analysis. Member checking will serve as the audit.

The results of this study fill a gap in eating disorder literature by describing how the lived experience of TGNC individuals connects to their eating behaviors. Understanding the domains through which body dissatisfaction and disordered eating behaviors are perpetuated among gender diverse people may assist clinicians in understanding their clients. This understanding may help clinicians provide better care to their clients.

THE INTERSECTIONAL EXPERIENCES OF RACISM AND ABLEISM FOR BLACK AUTISTIC INDIVIDUALS

Presenter(s): Moore, Raven, Graduate, Psychology
Jackson, Tyra, Graduate, Psychology
Towner, Jazmine, Graduate, Psychology
Bradley, Brittany, Graduate, Psychology

Mentor: Dr. Brea Banks

Authorship: Tyra Jackson, Raven Moore, Jazmine Towner, Brittany Bradley

Research centering the experiences of autistic people from an intersectional lens is limited. The focus of the current study surrounded the experiences of autistic individuals who are racialized as Black, as we were specifically interested in exploring how ableism and anti-Black racism influence individuals' access to socially just interventions and resources. Given our focus on ableism and anti-Black racism, our research was founded in critical theories that center the experiences of individuals holding these minoritized identities (i.e., Critical Race Theory and DisCrit). We recruited Black autistic adults and caregivers of Black autistic people and interviewed them about their experiences with diagnostics and access to resources. After transcribing the recorded interviews, we used thematic analysis to examine data. Results of the study will be discussed in the current presentation, as well as implications for practice and future research.

SELF-PRESENTATIONAL CONCERNS AFTER A GETTING-ACQUAINTED INTERACTION

Presenter(s): Morn-Toro, Carlos, Undergraduate, Sociology
Hoveke, Lily, Undergraduate, Psychology
Herman, Nolan, Undergraduate, Sociology
O’Gara, Kaysee, Undergraduate, Sociology
Strain, Audrey, Undergraduate, Psychology
Adams, Haley, Undergraduate, Psychology
Beckman, Kaley, Undergraduate, Sociology
Haislip, Nicole, Undergraduate, Sociology
Kuhn, Rory, Undergraduate, Psychology
Laux, Sydney, Undergraduate, Sociology
Spranger, Kinlee, Undergraduate, Sociology
Youngman, Dela, Undergraduate, Sociology

Mentor: Dr. Susan Sprecher

Authorship: Carlos Morn-Toro, Lily Hoveke, Nolan Herman, Sara Galati, Kaysee O’Gara, Audrey Strain, Haley Adams, Kaley Beckman, Nicole Haislip, Rory Kuhn, Sydney Laux, Kinlee Spranger, Dela Youngman

There are benefits of interacting with strangers, including enhanced mood (Sandstrom & Dunn, 2014). However, people often avoid interacting with strangers in part because of worry about the impression they will make. Self-presentation theory (e.g., Schlenker & Leary, 1982) argues that people are motivated to make positive impressions on others but worry that they may not. Although self-presentational concerns (SPC) have been measured as a stable characteristic, little research has measured SPC directly after a first meeting between two strangers. Some people may be especially likely to ruminate about what others think of them. In addition, some aspects of an interaction may heighten SPC. For this poster, we analyzed data collected in a prior getting-acquainted interaction study conducted at Illinois State University (Sprecher, 2021). That study focused on predictors of affiliative outcomes experienced after the interaction. For this poster, we analyzed (previously unpublished) data on the participants’ SPC expressed after the interaction. We explored whether the mode of communication and type of getting-acquainted task affected SPC. We also examined whether SPC varied as a function of shyness and attachment style. 103 dyads (majority female-female) participated. After completing a pre-interaction survey, the dyads interacted either face-to-face or over Skype (randomly assigned). The type of self-disclosure task (also randomly assigned) was either a closeness-generating procedure (Aron et al., 1998), a small-talk task, or an unstructured discussion. After the interaction, each member completed another online survey. The pre-interaction survey included a 13-item Shyness Scale (Cheek, 1983) and Bartholomew and Horowitz’s (1991) ratings of attachment styles. The post-interaction survey included a 4-item measure of SPC (e.g., “I was concerned about the way I presented myself to others”). On a 1 (low) to 7 (high) response scale, the overall mean of SPC was 2.98 (SD =1.72). No significant difference was found in SPC as a function of mode of communication or self-disclosure task. However, SPC was positively associated with shyness ($r=.42$, $p<.001$), a fearful attachment style ($r=.22$, $p=.001$), and a preoccupied attachment style ($r=.14$, $p=.04$); and negatively correlated with a secure attachment style ($r=-.18$, $p=.008$). In conclusion, the good news is that the overall level of self-presentational concerns after an interaction was not

high. Nonetheless, some people (those who were shy and those who had insecure attachment styles) had higher self-presentational concerns. We encourage future research that can help develop interventions to decrease such concerns, which will likely lead people to seek more weak-tie interactions.

IS HELP-SEEKING STIGMA EMBEDDED IN SOCIAL NETWORKS? AN EMPIRICAL SOCIOGRAM INVESTIGATION

Presenter(s): Nelson, Ryan, Undergraduate, Psychology
Curry, Alex, Undergraduate, Psychology
Igoe, Emily, Undergraduate, Psychology
Mentor: Dr. Dan Lannin
Authorship: Ryan Nelson, Alex Curry, Kenya Campbell

Stigma associated with seeking psychological help is a barrier to therapy utilization (Corrigan, 2004; Lannin & Bible, 2022). It comprises negative labels and stereotypes about help-seeking at the societal level (public stigma), among close relationships (stigma of close others), and applied to the self (i.e., self-stigma; Link & Phelan, 2001; Vogel & Wade, 2022). Self-stigma is a most proximal predictor of help-seeking behaviors and is theorized to develop when others' stigmatizing beliefs are internalized and applied to oneself. Expanding on previous research, this study investigated associations between participants' perceptions of their close relationships and help-seeking stigma. Participants completed a sociogram wherein they diagrammed their social network (Kitayama et. al., 2009). On the sociogram, participants included symbols that reflected, a) their attitudes toward others in their network, b) perceptions of others' distress, c) whether others had disclosed a mental illness, d) whether others had sought professional help, e) whether others had referred the participant to seek help, and f) whether the participant had referred that other to seek help. Participants then completed items assessing psychological distress, perceived stigma of close others, self-stigma of seeking psychological help, and demographic information. As of October 2023, 93 participants have been sampled and approximately 200 participants should be sampled by April 2024. Partial correlations were examined among study variables, controlling for participants' psychological distress. Results (see Table 1) indicated that the perception that others stigmatized seeking psychological health was inversely related to the number of a person's close relationships that had sought psychological help ($r = -.24$). People reported lower levels of self-stigma of seeking help when their social network had higher average levels of psychological distress ($r = -.22$), more people who had disclosed having a mental illness ($r = -.21$), more people who had sought psychological help ($r = -.26$), and more people who had recommended the participant seek help ($r = -.29$).

The present study's results highlight the social nature of mental health related stigma. Lower stigma levels were generally related to having social networks where psychological distress and help-seeking are more common and where people were willing to refer close others to seek help when needed. Greater openness and disclosure of mental health concerns within a person's social network may help normalize this behavior and buffer against concerns of stigmatization.

EXPOSURE TO DIVERSITY

Presenter(s): Nettnin, Ryan, Undergraduate, Psychology

Mentor: Dr. Suejung Han

Open and empathetic attitudes toward different races and cultural groups are important for interpersonal functioning (e.g. making close bonds and friendships towards others) in increasingly diversified society. Therefore, it is critical to identify what promotes such attitudes to find ways to implement them. Among many, exposure to different perspectives and cultures growing up through parental socialization, formal education, and/or community involvement may be essential for promoting such attitudes, Ellison et al. (2011) suggested that exposure to more diverse groups can be important in having more positive views for outgroups. Paulker et al. (2017) also discovered that when the white students were exposed to a different culture their modern racism decreased, as well as their social dominance orientation. The purpose of this study is to identify how exposure to different cultures while growing up will affect cultural empathy. The hypothesis is that more exposure to diversity while growing up will be associated with higher level of cultural empathy. College students that attend Illinois State University will be recruited through the Psychology Department SONA system for research participation credits. An online survey of the study will include the Scale of Ethnocultural Empathy (SEE, Wang et al. 2003), the Universal-Diverse Orientation Scale (Miville et al., 1999), and 8 items on exposure to diversity developed for this study. To ensure content validity of the newly developed items, undergraduate researchers rated each item on construct validity and only the items rated highly (i.e., 5 or above on the 7-point Likert scale) were included. The Implicit Association Test (IAT, Greenwald et al. 1998), a computerized cognitive task will be also used as an indicator for implicit racial bias.

Participants will come to the Psychology research lab, sign the informed consent form, and complete the survey and the IAT. The order of the survey and the IAT will be counterbalanced. The IRB is under preparation and full results will be presented at the symposium.

MESOSYSTEMIC INFLUENCES ON JUVENILE JUSTICE OUTCOMES

Presenter(s): Osman, Farhia, Graduate, Psychology

Mentor: Dr. Adena Meyers

Authorship: Erin Marchand, Kalysa Pampuch, Megan Mahoney, Blake Tennent

According to ecological theory research, the mesosystem is the interactions between the various microsystems of an individual (e.g., family, school; Newman and Newman, 2020). Applying ecological theory to the juvenile justice system, the interactions between the family, the school system, the court and probation system, etc. are all part of the youth offender's mesosystemic influences. Research and professionals involved within the juvenile justice system universally acknowledge that family and parental involvement is a protective factor for youth offenders (Burke, et al., 2014; Mallett, 2010; Schwalbe, 2012). Probation officers describe positive parental support as a partnership in care for the child, and emphasize uncooperative parents undermine youth participation and success in final outcome (Schwalbe, 2012). However, there is a lack of clarity upon how to quantify and measure family engagement (Schwalbe, 2012). This research operationalizes family engagement through the frequency of contact between the family and juvenile justice professionals. And it will utilize this definition to explore the relationship between family involvement and probation outcomes, and thus, mesosystemic influences upon the youth offender's final disposition.

Using archival data records of low-risk juvenile offenders from a rural Midwestern county, the researchers systematically coded records for analysis. A total sample of 505 subjects was used for analysis. Key variables of interest were used to compare contact between successful and unsuccessful completers of probation service. Additionally, binary logistic regression models were used to determine the likelihood of a successful outcome with higher contact frequency. Acknowledging youth with longer days of service would have more opportunities of contact, the researcher reported all contact data as a ratio divided by total days of service. It is hypothesized that higher frequency of contact will be significantly associated with successful disposition status, and family contact specifically.

A significant difference was for the unexpected direction of unsuccessful status. While some, logistic models provided context of likelihood of successful disposition while controlling for additional variables (e.g., total number of charges). Results from this study will add to the literature by providing an operationalization of family engagement within the juvenile justice system. It also highlights the communication between the probation system and family through the language of ecological theory, and the mesosystemic influences of the youth offender upon their probation outcome.

DEPRESSION AND ANXIETY IN CHILDREN WITH AUTISM: IMPLICATIONS OF THEORY OF MIND

Presenter(s): Pampuch, Kalysa, Graduate, Psychology

Mentor: Dr. Karla Doepke

While there is abundant research on Theory of Mind (ToM) in children with autism spectrum disorder (ASD), much of this research does not discuss what this means for mental health implications. The current presentation aims to determine implications of ToM on anxiety and depression in children and adolescence. Mental health disorders, specifically anxiety and depression, have immense implications on a person's well-being, however limited research has been done surrounding mental health in children and adolescence with ASD. The current study aims to determine relationships and predictors of these mental health aspects using Theory of Mind (ToM), a widely studied concept in individuals with ASD. This study had 12 participants (10 male, 1 female), aged between 9-16 years old. Most of the participants were white (11 white, 1 Latiné). Each participant completed one task battery and two self-report rating scales. To determine the participants' ToM, the Theory of Mind Task Battery (Hutchins et al., 2014) was used. Anxiety was measured through the Revised Children's Manifest Anxiety Scale – Second Edition (RCMAS-2; Reynolds & Richmond, 2008). Lastly, depression was measured through the Children's Depression Inventory – 2nd edition (CDI-2; Kovacs, 2011). A significant relationship was found between all 3 variables. Additionally, higher ToM was predictive of higher anxiety and depression scores across all participants. This study adds to existing literature on ToM on individuals with ASD while also highlighting the implications higher ToM has on mental health. Often times, individuals are less likely to receive support for these mental health needs, and this study emphasizes the need to intervene earlier with mental health supports for children with ASD.

EMBRACING DIVERSITY IN SUPERVISION: NAVIGATING DIVERSE IDENTITIES AND EXPERIENCES

Presenter(s): Shaull, Marissa, Graduate, Psychology

Mentor: Dr. Shengtian Wu

Authorship: Marissa L. Shaull, Shengtian Wu

Supervision is defined as a professional relationship in which a more experienced individual in a specific profession provides guidance, support, and oversight to a less experienced individual/s (Newman et al., 2018). Supervision serves as a mechanism for maintaining professional standards, ensuring ethical guidelines, and promoting best practices within a space that allows for collaboration, consultation, and ongoing learning (Newman et al., 2018). Students from marginalized identities, including but not limited to race, ethnicity, gender identity, sexual orientation, and disability, face disproportionate challenges within the supervisory process. When supervisors fail to recognize and address the experiences and needs of graduate students with diverse identities, it can harm their professional development (Soheilian et al., 2014). Supervisors play a critical role in creating a safe and inclusive space for trainees of all backgrounds, where their identities and experiences are valued and supported to allow for professional growth and well-being (Hagler 2020).

ASYNCHRONOUS FUNCTIONAL ANALYSIS TRAINING: A NEW APPROACH TO EDUCATING EDUCATORS

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

Mentor: Dr. Shengtian Wu

Authorship: Kathleen Shields, Hannah Cremer, Kaley Norman, Shengtian Wu

Telehealth is an interactive service delivery method of providing a variety of mental health services and resources to areas by using video technology (Backhaus et al., 2012). Telehealth increases the opportunity for school psychologists to collaborate with school personnel from all over the country from a central location session (Bice-Urbach & Kratochwill, 2016). The use of platforms (e.g., Zoom) provides professionals with the option to record sessions for team members to review at a later time. Consultation via telehealth addresses many of the barriers faced by mental health providers and schools while also increasing overall mental health equity. Telehealth services that have been found beneficial when implemented within the educational field include trial-based functional analysis training (TBFA; McGarry et al., 2022), preference assessments (Machalicek et al., 2009), behavior intervention plans (Bice-Urbach & Kratochwill, 2016), and singular behavioral interventions (Hay-Hansson & Eldevik, 2013). Despite the established benefits of telehealth, its applications remain relatively novel in the field of school psychology and elements of the format have yet to be explored in the literature. Little, if not any, research has explored the process of training educators using a purely asynchronous telehealth format. The current study aimed to further examine the benefits of telehealth by training educators how to conduct TBFA in an asynchronous manner.

THE IMPACT OF INSTRUCTIONAL TIME ON READING COMPREHENSION IN JUNIOR HIGH SCHOOL STUDENTS

Presenter(s): Smith, Andrea, Graduate, Psychology

Mentor: Dr. Gary L. Cates

Authorship: Andrea Smith, Evan Daly, Danielle Gesell, Gary Cates

Reading comprehension is a skill used to evaluate the extent to which a student understands the content and context of what they read. Two reading comprehension strategies include click and clunk, and repeated reading. While past research has indicated there isn't a best reading intervention strategy for students, there is a lack of research evaluating and comparing the time needed to implement reading interventions. The present study aimed to assess the effectiveness of different reading interventions among two junior high school-aged students, with a focus on determining the most time-efficient approach. This evaluation was conducted by using inferential and factual multiple-choice questions as indicators of intervention effectiveness. Intervention results were varied for both students. These findings suggest educators and schools should determine the most efficient strategies to teach students by using accuracy and instructional time. Future research is needed to explore the extent to which these results generalize to additional academic subjects.

MANUAL THERAPY FOR TRIGGER POINTS IN THE DELTOID

Presenter(s): Torres González, Nitza, Graduate, Psychology
Concepción Cabán, Lourdes, Graduate, Psychology

Mentor: Dr. Brea M. Banks

Authorship: Lourdes D. Concepción Cabán, Nitza M. Torres Gonzalez, Brea M. Banks

Youth with disabilities encounter unique obstacles in expressing and exploring their sexual identity. Although research suggests that youth with disabilities experience similar sexual development processes as their non-disabled peers (Bonder et al., 2021), how they are treated, educated, and viewed significantly varies from their counterparts (Baines et al., 2018). Ableist attitudes and beliefs can create barriers, perpetuating stereotypes that undermine disabled youth's sexual agency and self-perception (Gordon et al., 2004). Such experiences may lead to diminished physical and psychological health, confusion about one's sexual identity and sexuality status, and overall well-being (Shah, 2017). The proposed presentation will challenge barriers and promote a more inclusive understanding of sexuality for youth with disabilities so that all will have equal access to sexuality-related information and services (Bonder et al., 2021).

To achieve this goal, the proposed presentation will focus on the complex relation between sexuality and ability, as Presenter(s) will address key issues and highlight the need for a more inclusive approach to understanding and supporting youth with disabilities. By examining the existing research, this session will provide a comprehensive understanding of the complexities surrounding the intersection of sexuality and ableism for adolescents. Presenter(s) will explore the challenges faced by youth with disabilities in expressing and exploring their sexual identity, including societal barriers, ableist stereotypes and microaggressions, and misconceptions.

EVENT CENTRALITY AND POSTTRAUMATIC GROWTH: THE ROLE OF MEANING MAKING

Presenter(s): Verdeyen, Haileigh, Graduate, Psychology

Mentor: Dr. Suejung Han

Authorship: Haileigh Verdeyen, Suejung Han

Problem

Research shows that experiencing traumas can cause problematic life outcomes (e.g., McLaughlin & Lambert, 2018), particularly for when individuals consider the traumatic events as central to their identity (e.g., Keshet et al., 2018). However, research shows such event centrality could also promote post-traumatic psychological growth (PTG). It has not been clear when event centrality causes post-traumatic distress vs. PTG. I suggest that meaning making (i.e., searching for meaning in one's life after trauma and found meaning) could play a moderating role in PTG (Groleau et al., 2013).

The study hypotheses are: (a) Event centrality will be positively but weakly associated with PTG; (b) Meaning making moderate the association between event centrality and PTG such that when meaning making scores are high, the association between event centrality and PTG will become stronger.

Procedure

College students at a Midwestern university will be recruited to an online survey of this study through the Psychology Department SONA system. Studies show that majority of college aged students have experienced at least one traumatic event (e.g., Read et al., 2011) and that 21% of those reported a traumatic experience during a two month period in college. The power analysis suggested a minimum of 55 participants needed for the power of .08. The measures include Life Event Checklist [LEC; (Gray et al., 2004)], Centrality of Events Scale [CES; (Berntsen & Rubin, 2006)], and the Posttraumatic Growth Inventory [PTGI; (Tedeschi and Calhoun, 1996)]. Meaning making will be measured using two items from a previous study.

(Spero, 2016), the deliberate rumination subscale of the Event Related Rumination Inventory (Cann et al., 2011), and a 14-item survey developed for this study.

To test the hypotheses, a moderated regression analysis will be conducted using SPSS PROCESS (Hayes, 2018), with event centrality as the independent variable, PTG as the dependent variable, and meaning making as the moderator. The IRB review is underway. Online survey data collection is planned to be completed by January 2024. Data analysis will be conducted in February 2024 for the full results to be ready to present at the conference in April 2024.

Expected Implications

The results of this study have potential to improve therapy for those with traumatic experiences by focusing on the meaning making process. In addition, this study has the potential to allow for better understanding of how growth can be promoted.

EMOTION-REGULATION BENEFITS OF MUSIC LISTENING VERSUS TALKING WITH OTHERS

Presenter(s): Walis, Emma, Undergraduate, Psychology
Bopp, Mallory, Graduate, Psychology

Mentor: Dr. Jeffrey Kahn

Authorship: Jeffrey H. Kahn, Aubrey Thimesch, Emma Walis, Mallory Bopp

Among the possible coping strategies used to recover from an unpleasant event, talking with others has a profound impact on regulating distress (Garrison & Kahn, 2010). Disclosure enables emotional expression, empathy, and interpersonal support (Zaki & Williams, 2013). Among young adults, listening to music is as common a coping strategy as disclosure (Kahn et al., 2022), and listening to music regulates emotion through introspection and expression (van Goethem & Sloboda, 2011). This suggests parallel regulation benefits, but, to our knowledge, there have been no naturalistic, direct comparisons made between benefits of emotional disclosure and listening to music; this comparison was the aim of our study.

College students (N = 116) completed a 14-day diary study. Participants described the day's most unpleasant event, its intensity (Garrison & Kahn, 2010), the degree to which they listened to music and talked with others about the event, and the benefits gained from that coping strategy, including their emotional expression, emotional awareness, feeling that others shared the experience, and interpersonal support (Kahn et al., 2022).

Based on daily reports, analyses addressed whether participants were as likely to talk with others about unpleasant events as they were to listen to music. We also examined whether emotional disclosure led to similar benefits compared to listening to music. Analyses were based on an examination of means and correlation coefficients. Preliminary analyses determined nearly identical correlations between experiencing regulation and (a) talking to others and (b) listening to music.

We expected that, consistent with previous research, results of this study would support that listening to music as a way to process distressing emotions mirrors benefits associated with emotional disclosure practices (Kahn et al., 2022). Echoing theoretical frameworks of interpersonal emotion regulation (Zaki & Williams, 2013), listening to music after a distressing event may promote emotional well-being akin to social interactions, reflecting practices such as emotional expression, support, and coping (Swaminathan & Schellenberg, 2015). The poster will elaborate on these findings, examine the interplay of interpersonal emotion regulation, and offer suggestions for future research.

SEXUAL HARASSMENT OF ADOLESCENT WORKERS: GENDER AND COPING DIFFERENCES

Presenter(s): Williams, Sarah, Undergraduate, Psychology

Kuhn, Rory, Undergraduate, Psychology

Mentor: Dr. Kimberly Schneider

Authorship: Sarah Williams, Rory Kuhn, Kimberly Schneider

Purpose: The U.S. Bureau of Labor Statistics reported in 2023 that 21.6 million youth ages 16-24 were employed (United States Bureau of Labor Statistics, 2023), primarily in service industries with prevalent sexualized behaviors (Blackstone, 2014). While extensive research has addressed adolescent work, there is less regarding their sexual harassment and coping. Although part-time work is theorized to be a context in which adolescents develop their self-concepts and work ethics (Hill, 1983; Arnett, 2000), less is known about how adolescents choose to cope with harassment they encounter. Our study focused on how adolescents' coping with harassment may be similar or different from adults' coping.

Method: Surveyed participants were 234 college students (97 males; 137 females; ages 18-19) who gave retrospective accounts as working adolescents (ages 15-18). Demographic variables, such as age, job title, and hours worked per week, were collected along with additional measures of harassment experiences and coping strategies. To assess harassment experiences, female participants were given the Sexual Experiences Questionnaire (SEQ; Fitzgerald et al., 1988), and male participants were given the Sexual Harassment of Men Scale (SHOM; Berdahl, Magley, & Waldo, 1996). Coping strategies were assessed with a shortened version of the Coping with Harassment Questionnaire (CHQ; Fitzgerald, 1990).

Results: Like adult samples, gender harassment was experienced most frequently by adolescent females (70%), followed by unwanted sexual attention (56%) and sexual coercion (14%). Adolescent males most frequently experienced gender harassment that included lewd comments (60.8%), gender harassment focused on enforcement of male stereotypes (37.1%), unwanted sexual attention (30.5%), and, least frequently, sexual coercion (5.2%). The most common coping strategy reported by adolescent female targets was behavioral disengagement (reported by 93.5% of the harassed respondents), followed by cognitive engagement and behavioral engagement (54.3% and 52.7%, respectively), whereas cognitive disengagement was fewer targets (47.3%). Cognitive engagement was the most common strategy adolescent males used to cope (50.5%), followed by cognitive disengagement (41.3%), behavioral disengagement (40.7%), and behavioral engagement was used least frequently (34.8%).

Conclusions and Implications: Findings from this study indicate that adolescent workers experience higher incidences of sexual harassment than reported by adult samples of academic and private sector workers. Correlations between harassment and coping strategies also emerged. These results may be beneficial to parents as they prepare their adolescent to work outside the home, high school counselors who may guide teens through stressful experiences, and to adolescents themselves as they negotiate the world of work.

PARENT-CHILD INTERACTION AND DEVELOPING RESILIENCE IN YOUNG CHILDREN

Presenter(s): Yum, Seungok, Graduate, Psychology
Brzezniak, Emilia, Undergraduate, Psychology
Castor, Arely, Undergraduate, Psychology
Charles, Mahika, Undergraduate, Psychology
DeGould, Sarah, Undergraduate, Psychology
Nelson, Ryan, Undergraduate, Psychology
Perez, Kimberly, Undergraduate, Psychology
Sullivan, Tyler, Undergraduate, Psychology
Thompson, Raegen, Undergraduate, Psychology
Weber, Caitlyn, Undergraduate, Psychology
Wissler, Abby, Undergraduate, Psychology

Mentor: Dr. Alycia M. Hund

Authorship: Seungok Yum, Emilia Brzezniak, Arely Castor, Mahika Charles, Sarah DeGould, Ryan Nelson, Kimberly Perez, Tyler Sullivan, Raegen Thompson, Caitlyn Weber, Abby Wissler, Alycia M. Hund,

Early childhood is an important period to develop resilience due to social, academic, and emotional benefits for later development. Previous studies pointed out that parental warmth and support can enhance resilience in children by increasing children's self-esteem and self-regulation (Harter, 1998; Moghaddam et al., 2017). In contrast, hostile and coercive parent-child interactions can disturb developing resilience by increasing children's internalizing symptoms and behavioral difficulties (Bor & Sanders, 2004; Stevenson & Crnic, 2013). Although previous studies examined resilience in children, most of the research relies on parent-reported measures of resilience (King et al., 2021). The purpose of this study was to investigate how parental warmth and support, or hostile and coercive behaviors relate to resilience in preschool children during a challenging puzzle task. To date, 37 children aged 4 to 5 years and their parents have participated. Parents were asked to complete the Parent Behavior Inventory (PBI) to measure parent-child interaction styles (support/engagement and hostility/coercion) and the Strengths and Difficulties Questionnaire (SDQ) to measure their perceptions of resilience about their children. Children participated in a challenging puzzle task that consisted of five puzzle sets (a possible puzzle, 3 impossible puzzles, and a possible puzzle), which were adapted from two previous studies (Cole et al., 2007; King et al., 2021).

After each puzzle, children were asked to rate their resilience by answering three items (positive self-evaluation, hopefulness, and motivation) using a 5-point Likert scale with stars or faces. We predict that children's self-rated resilience will positively correlate to warm/supportive parent-child interactions but negatively to hostile/coercive parent-child interactions. We also expect that parents' perceived resilience about their children will positively correlate to warm/supportive parent-child interaction but negatively to hostile/coercive parent-child interactions. This study may provide details for families, practitioners, and researchers to help support young children's resilience.

SOCIAL WORK

CAREGIVERS OF CHILDREN WITH PHYSICAL AND MENTAL HEALTH CONCERNS: WHAT ARE THEIR NEEDS AND OBSTACLES TO CARE

Presenter(s): Barnes, Desiree, Graduate, Social Work

Mentor: Dr. Christopher Gjesfjeld

Parents who care for a child with a physical or mental health condition appear to be impacted by greater health and mental health concerns themselves. These parents may require specific services yet may present with specific challenges accessing to these resources. These supports, which may include health or mental health services, assist these parents in caring for their children. This study sought to identify obstacles that caregivers are experiencing, if any, in obtaining resources for their mental and physical health conditions. In addition, we wanted to understand how they rate their own ability to provide care to children with mental or physical health conditions. We created a 11-question survey that was provided to parents/caregivers of students within District 87. This data will provide insight into the needs of our parents and possible services that may be lacking within the community. Understanding how parents view their ability to meet the needs of their children may assist future efforts to link these caregivers/parents to necessary support to improve their caregiving.

MCLEAN COUNTY DRUG COURT TARGET POPULATION

Presenter(s): Birditt, Bailey, Graduate, Social Work

Mentor: Dr. Kate Sheridan

The National Association of Drug Court Professionals, recently renamed "All Rise" provides evidence-based best practice standards for drug court programs operate. The guidelines are the blueprint for desired outcomes for individuals involved in the criminal justice system as a result of substance use and mental health disorders. Drug courts are most effective for individuals with higher risks of reoffending and high needs in terms of substance use and addictions treatment. This proposed study aims to determine whether or not McLean County Drug Court is reaching the defined target population: high-risk / high-need. Eligibility criteria along with demographic information will be reviewed to assess any disparities in referrals, admissions, and graduation rates utilizing the Equity and Inclusion Assessment Tool (EIAT).

The purpose of this study is to explore whether McLean County Drug Court has equivalent access and retention for all who qualify for the program.

FACTORS LEADING TO STAFF LONGEVITY IN TWO RURAL ELEMENTARY SCHOOLS

Presenter(s): Casselman, Carly, Graduate, Social Work

Mentor: Dr. Chris Gjesfjeld

The study I am conducting aims to look at a few different areas and objectives. I wish to better understand what leads to overall staff longevity within Olympia North and Olympia West Elementary Schools, as well as what factors lead to this longevity. I chose to study this area because I felt that there was a plethora of prior research done on staff turnover and teacher turnover in schools, as well as how that affects students' learning and achievement. I wanted to look more into what leads teachers to stay, and how that differs from prior institutions they had worked at. I want to look into more specific characteristics of what a school or administration has that is a desirable trait for staff members working there. I feel that this type of research can help support schools with high turnover in ways they can improve some specific characteristics.

I am going to gather this data by designing a survey that will gather some baseline information, such as age, race, and number of years in a given district. I will next provide various multiple choice options which will gather reasons why a staff member left their previous district or position. This will help compare one institution to another and pick out some specific characteristics. This will be conducted in the form of a Google Survey, and emailed out to all staff members at the two schools that I am placed at. The survey will be available to complete for around two weeks to accommodate for the busy schedules of the school staff, and hopefully increase the likelihood of the majority of the staff completing it.

I anticipate this study will provide me some more insight into some desirable characteristics of certain schools, along with the values that the staff hold when considering a school. I anticipate that overall staff support and administrative support will be one of the higher-picked options, and that it is one of the leading factors of staff longevity. I also anticipate that overall school location will be another large factor.

FIRST STAR ACADEMY-RESEARCH

Presenter(s): Crowder, Diamond, Graduate, Social Work

Mentor: Dr. Kate Sheridan

First Star Academy is a program on ISU campus offered to youth in care currently in high school in Illinois. First Star helps foster youth in preparing for college including Saturday Academies throughout the year focusing on skills needed to apply and be successful as a college student. The program enrolls approximately 12 high school students annually. First Star Scholars also attend a 2-week summer immersion program on ISU campus. The purpose of this proposed study is to examine the topics of interest for upcoming programming from the perspective of First Star Scholars. There is no interaction with human subjects in this proposed study because the focus groups were already conducted earlier this year. Focus group participants included nine high school-aged students, 14-18 years of age.

Research will be conducted by listening to and transcribing the focus group recording, and identifying themes that the Academy can use to adjust the upcoming Summer Immersion Program.

THE EFFECTIVENESS OF CALMING STRATEGIES IN THE GENERAL EDUCATION CLASSROOM

Presenter(s): Dillman, Alexandra, Graduate, Social Work

Mentor: Dr. Kate Sheridan

The purpose of this proposed study is to examine the effectiveness of tier 1 SEL calming strategies in the general education classroom at Washington District 50 in Washington, Illinois.

Participants include both K-8 grade students and adults aged 18 of age or older.

Participants will be invited to complete a survey. A second source of data is the Illinois Renewal SEL study that was completed at the end of last school year by teachers and students in grades K-8.

THE IMPACT OF BRIEF EXERCISE ON EMOTION REGULATION

Presenter(s): Fields, Allie, Graduate, Social Work

Mentor: Dr. Christopher Gjesfjeld

For many individuals with mental health diagnoses, medication alone is insufficient to manage their symptoms. Finding the right combination of mental and physical health treatment to balance wellness can be difficult, and once found, can be a struggle to maintain long-term.

Marsha Linehan had that knowledge in mind when she developed dialectical behavior therapy (DBT). Originally developed for chronically suicidal individuals, DBT has since been found to be evidence-based for multiple mental health and addiction disorders. DBT consists of several skills—mindfulness, interpersonal effectiveness, emotion regulation, and distress tolerance— designed to help individuals live lives worth living. One of the emotion regulation skills is the

PLEASE skill-- Treat Physical L illness, balance Eating, avoid mood-Altering substances, balance Sleep, and get Exercise. Brief exercise has been shown to reduce emotional vulnerability, especially when individuals can pick the type and length of exercise. This study aims to examine the impact brief aerobic exercise has on emotion regulation.

Adult participants will be recruited from the outpatient behavioral health department at Carle BroMenn Outpatient Center. Participants must engage either in dialectical behavior therapy group skills training or individual DBT therapy. A pre-test, post-test method will be used with questions from the Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004).

Participants will complete the questionnaire and receive education on the PLEASE skill. They will then be encouraged to engage in aerobic exercise twenty minutes a day, three to four days per week over the course of two weeks. The pre-and post-test results will be compared to assess their exercise habits and emotion regulation strategies.

Results are forthcoming; however, it is anticipated that individuals who frequently engage in brief aerobic exercise over two weeks will report lower levels of emotional vulnerability and improved emotion regulation than those who do not engage in brief aerobic exercise. Prior research has shown the numerous benefits of exercise, but not specifically looked at the benefits of brief aerobic exercise on emotion regulation. Improved emotion regulation skills can positively affect one's sense of well-being and give them the mastery needed to maintain healthy lives worth living.

READMISSION RATES FOR PATIENTS ON ONE FLOOR OF A HOSPITAL

Presenter(s): Gulik, Stephanie, Graduate, Social Work

Mentor: Dr. Kate Sheridan

This research explores the readmission rate for patients on one floor of a hospital. I'm looking to find a pattern within the patients who often are readmitted and if there is any additional support as well as information we could provide to these patients in order to reduce readmission.

The instrument I have created will be sent to 16 people in various roles on the hospital floor.

The information collected from the staff will be used to gain better insight of the treatment we provide to patients after they are discharged. This information will help me better understand the factors that go into a patient's readmission.

EXECUTIVE FUNCTIONING IN HIGH SCHOOL FRESHMAN

Presenter(s): Hacaga, Theadora, Graduate, Social Work

Mentor: Dr. Kate Sheridan

Spartan Stretch which a study hall where a variety of social emotional interventions are implemented with students in grades 9-12. Some of the scheduled Spartan Stretch times are set aside as a study hall to complete assignments. The Spartan stretch period is 30 minutes on Monday, Tuesday, Wednesday and Friday. Interventions include, for example, online work, worksheets, and other activities aimed at helping students manage their academics and learn social emotional skills.

This proposed study aims to assess executive functioning skills among Freshman at Sycamore High School of being able to organize their academic requirements, organize personal commitments and time management such as use of a planner, organizing and composing note taking skills, checking and sending emails, and managing assignment due dates and creating a plan to recognize and correct missing assignments.

All Spartan Stretch Freshman students will be invited to complete a global checklist. A defined group of students that are enrolled in Spartan Stretch will be invited to complete a pre-post test.

EXPLORING TRUANCY: THROUGH THE LENS OF A PARENT LIAISON

Presenter(s): Jefferson, Valeria, Graduate, Social Work

Mentor: Dr. Chris Gjesfeld

Truancy, unexcused absence from school, is a longstanding and widespread issue throughout the world. When students are absent from school their academic performance/progression, social functioning, mental health, prosocial behaviors, and overall livelihood, is impacted. The reasons for truancy are broad and diverse in nature and go beyond choice at times. Those reasons include environmental, psychological, and social factors. Research has identified reasons for truancy and how it adversely affects students, however, research on developing and testing interventions and strategies connected to the causes of truancy is unsatisfactory. This case study's purpose is to obtain more in-depth understanding of patterns and experiences of truancy in middle school children (ages 11-14yrs) through the lens of a parent liaison.

To further investigate the issue of truancy, a 6-item interview will be conducted with a parent liaison from a Junior High school located in central Illinois. Responses will be recorded and transcribed through Otter transcription software. Additionally, quantitative data will be collected using chronic absenteeism data from fall 2019- fall 2023 from the school district. Results from this study have not yet been collected, however, I anticipate results will cover 3 main concepts: student experience, interventions, and effectiveness of interventions.

In the interim, responses from this study will contribute to the ongoing discussion of developing more sophisticated interventions that will reverse the rise of truancy rates and address the barriers to attending school for students and families. In other words, interventions will be connected to the causes of truancy and thus, produce an increase in school attendance. The limitations of the study include the years in which data was collected. For example, The COVID-19 pandemic could serve as a confounding variable. Additionally, relying on one subject for a broad topic that is complex in nature and therefore, may not be representative of the entire truant population.

RACIAL IDENTITY, SPECIAL EDUCATION ELIGIBILITY, AND BEHAVIORAL REFERRALS IN SPECIAL EDUCATION

Presenter(s): Pecoraro, Joie, Graduate, Social Work

Mentor: Dr. Chris Gjeffeld

Special education teachers should consider a multitude of factors when referring students for special education evaluation. The evaluation process- and potential eligibility- can become convoluted with personal bias, thus not prioritizing the child's needs. Minority students are particularly susceptible to such bias, especially in predominantly White areas. To avoid promoting a special education culture which disproportionately impacts minority students, the present research seeks to identify existing correlations between students' special education eligibility, racial identity, and their received behavioral infractions. The researchers wish to understand whether or not racial identity is related to students' eligibility categories, or how they're treated behaviorally within the school. The present study will also collect qualitative data to ask questions regarding special education teachers' perceptions of their own practice, and what factors they consider when making special education referrals.

DO EDUCATORS PERCEIVE POSITIVE CHANGE IN STUDENT SOCIAL, ACADEMIC, AND EMOTIONAL BEHAVIOR WITH EVIDENCE-BASED SEL LESSON IMPLEMENTATION?

Presenter(s): Rutledge, Hailey, Graduate, Social Work

Mentor: Dr. Christopher Gjesfeld

In recent years, there has been a growing recognition of the crucial role that Social Emotional Learning (SEL) holds in education. This growing recognition is being driven by evidence of its benefits for students' academic achievement and their overall well-being. Social Emotional Learning includes a wide range of skills and competencies that are important for students to have the ability to navigate through life. The skills associated with SEL includes self-awareness, self-management, responsible decision-making, social awareness, and relationship skills. More research is showing that students participating in SEL programs exhibit improved academic performance, enhanced social-emotional skills, and reduced behavioral issues. This research aims to explore the significance of implementing evidence based SEL programs in educational settings, focusing on the perspectives of teachers as key stakeholders. It explores the findings of various research studies, including a comprehensive survey conducted among teachers, administrators, and parents, which underscored the short-term and long-term benefits of SEL, such as improved mental health and positive relationships.

Central to the exploration of this research, is the evaluation of the effectiveness of a universal SEL program, Kindness in the Classroom (KiC), implemented in a rural elementary school district. This program, developed by Random Acts of Kindness, emphasizes kindness as a core value and provides structured lessons aimed at fostering prosocial behaviors and enhancing SEL skills among students. Initial findings from an unpublished study located within their website revealed promising outcomes, including higher ratings of prosocial behaviors and improved SEL skills among students. My research is aimed at further examining the impact of SEL programs on student behavior, particularly focusing on changes observed from pre- to post-implementation of the KiC curriculum. A Google Form survey will be utilized to gather feedback from teachers regarding their perceptions of student behavior following the introduction of SEL lessons. This data will provide valuable insights for stakeholders, enabling informed decision-making regarding the continuation and refinement of SEL programming in the school district. This data will be collected with Google forms twice over the school year to observe any changes.

By investigating educators' perspectives on SEL implementation and its effects on student behavior, this research aims to contribute to the ongoing discussions on effective strategies for promoting social-emotional development in educational settings.

PARENTS' PERCEPTION OF SOCIAL EMOTIONAL LEARNING NEEDS AT BOYS AND GIRLS CLUB BLOOMINGTON-NORMAL

Presenter(s): Sellmyer, Hannah, Graduate, Social Work

Mentor: Dr. Kate Sheridan

The purpose of this proposed study is to determine the social-emotional education needs of Club Members at the Boys and Girls Club of Bloomington-Normal as perceived by their parents or guardians. Participants will include adults over the age of 18. Participants will be invited to complete a survey regarding the perceived needs of their child. The information will be used to inform social-emotional programming topics.

EXAMINING TEACHER'S PERCEPTION OF SOCIAL PROBLEM-SOLVING SKILLS IN PRE-KINDERGARTEN CHILDREN

Presenter(s): Stewart, Deanna, Graduate, Social Work

Mentor: Prof. Christopher Gjesfjeld

Authorship: Deanna Stewart, Christopher Gjesfjeld

The development of social problem-solving skills is a critical aspect of a child's early developmental journey. Over time, children learn to identify a problem, generate potential strategies to resolve the problem, decide upon which strategy to use, and put into practice the solutions to problems (Nakamichi et al., 2019; Romano et al., 2019). School Social Workers are often tasked with helping children develop social problem-solving skills. However, in early learning (3-5 years old), many social workers depend on the data provided by the classroom teacher to determine the child's competence with this developmental skill.

This project is a qualitative approach to analyzing how teachers perceive social problem-solving skills in pre-kindergarten children. It is hypothesized that their perception of this skill impacts how they collect and report data which is reflected in the Unit 5 School District's observational assessment system.

I will administer a voluntary survey for each pre-kindergarten teacher of a blended and special education classroom. Gaining a better understanding of the teacher's perception of social problem-solving skills could provide more insight on Brigham Early Learning's consecutive low scoring in this domain of social- emotional development. Further, implications for findings include possible curriculum changes or staff trainings in the future for Brigham Early Learning Center.

UNIVERSAL SOCIAL EMOTIONAL SCREENER AT BOYS AND GIRLS CLUB OF BLOOMINGTON- NORMAL

Presenter(s): Strader, Abbi, Graduate, Social Work

Mentor: Dr. Kate Sheridan

Boys & Girls Club of Bloomington-Normal is an out of school setting that provides a trauma informed space for youth ages five to seventeen. BGCBN operates after school programming for about two to four hours. The purpose of the study is to summarizing and analyzing the existing data of universal screener Strengths and Difficulties questionnaire collected by Boys and Girls Club of Bloomington-Normal in October 2023. This data from the SDQ will be used to develop programs for members of the Boys & Girls Club. Scores in the clinically significant range will be used to identify members for specific interventions. Participants are aged seventeen and younger.

PERSPECTIVES OF THE SCHOOL SOCIAL WORKER

Presenter(s): Torrasi, Cassie, Graduate, Social Work

Mentor: Dr. Kate Sheridan

The primary objective of this study is to investigate the various perspectives concerning the role and functions of a school social worker at Miller Elementary School in Westmont IL.

Participants include school staff aged 18 of age and older. Participants will be invited to complete a survey electronically.

This study is not human subjects research because there is no intent to develop or contribute to generalizable knowledge or disseminate findings publicly.

SOCIAL EMOTIONAL HEALTH IN ADOLESCENTS

Presenter(s): White, Ashley, Graduate, Social Work

Mentor: Dr. Kate Sheridan

The aim of this study is to help adolescents at Dwight Public Schools manage their internalizing behaviors by enhancing the social services provided.

OVERALL SUCCESS RATE OF LIFE SKILLS AND PROFESSIONAL DEVELOPMENT FOR STUDENT-ATHLETES AT ISU

Presenter(s): White, Destiny, Graduate, Social Work

Mentor: Dr. Kate Sheridan

The Karin L. Bone Athletic Study Center is a space strictly for student-athletes to help with success in college.

The purpose of this study is to examine the overall success rate of life skills and professional development for student-athletes. Participants include adults ages 18-24 years old.

Participants will be college age student-athletes, ages 18-24 years-old, asked 30 questions via questionnaire about life skills and professional development through the lens of athletics.

CROSS-CULTURAL EFFECTIVENESS OF THE EDINBURGH POSTNATAL DEPRESSION SCALE (EPDS)

Presenter(s): Yeboah, Yaa Adubia, Graduate, Social Work

Mentor: Dr. Christopher Gjesfjeld

Perinatal depression is a prevalent disease that affects many women during pregnancy and after delivery. If not addressed, it can negatively affect their newborn baby and immediate family members. Research indicates that the Edinburgh Postnatal Depression Scale (EPDS), which is well-known for its multilingual translation, is a screening tool used globally to alleviate the negative implications of prenatal depression.

This study assessed the cross-cultural effectiveness of the Edinburgh Postnatal Depression Scale (EPDS) using a grounded theory of explorative qualitative approach. The researcher conducted in-person one-on-one interviews with the Family Case Managers (FCM) of Mclean County Health Department, who answered six major open-ended questions, and the aim was to explore the variables/content of the questionnaire and whether the variables/content of the screening assessment form (EPDS) include cultural/ethnic groups.

Data will be forthcoming in April 2024. The findings will help stakeholders understand the validity and reliability of EPDS scores across different cultural groups and if the scale's cultural sensitivity and effectiveness need to be improved.

SOCIOLOGY/ANTHROPOLOGY

AN EXPLORATION OF MENOPAUSE: YOUNG PEOPLE'S PERCEPTIONS OF WOMEN IN MENOPAUSE, AND MENOPAUSAL WOMEN'S EXPERIENCES

Presenter(s): Fleming, Fiona, Graduate, Sociology and Anthropology

Mentor: Dr. Susan Sprecher

Authorship: Fiona Fleming

Menopause is a transitional phase in a woman's life, and society is filled with negative stereotypes of women in menopause. Menopause is a difficult period for many women due to hormonal fluctuations, changes in their bodies, and various other health effects. Aging in general for women is stigmatized due to societal beauty standards, and menopause serves as a marker of the transition into later adulthood (Chrisler 2011). The negative stereotypes of menopause in the media can cause the general public to hold negative perceptions regarding menopausal women (Gannon and Stevens 1998). Additionally, the views held by close others can affect how women in menopause view themselves and their menopausal transition (Li et al. 2013). The purpose of my study was to build off prior research surrounding perceptions of menopause and look specifically at young people's perceptions of women in menopause.

My study utilizes an experimental vignette method, which seeks to examine young adults' perceptions of a hypothetical woman as a function of whether it is explicitly stated that she is undergoing menopause, as well as a function of the age of the woman (either 43 or 60). The dependent variables in this study are the participants' perceptions of the temperament of the woman in the vignette (e.g., moods such as depression, anxiety, or irritability), the perceptions of the woman's capability to handle everyday tasks (both in the home and at work) and perceptions of her relationship with her children and spouse (such as if the couple is still sexually active). These variables were assessed through several questions relating to the target's relationships and actions. The sample for this study was a convenience sample consisting of young adults between the ages of 18 and 25, and participants were primarily through emails sent to ISU students, as well as through my own social media platforms.

Preliminary results show that the participants perceived the woman quite similarly (on the various dimensions assessed) regardless of her age or menopause status. Limitations of this study will be discussed, and plans for a follow-up study assessing middle-aged women's own experiences and attitudes toward menopause will be presented.

IMPRESSION FORMATION FROM ONLINE DATING PROFILES: WHAT TYPES OF STATEMENTS LEAD TO MORE ATTRACTION AND DOES IT DEPEND ON THE GENDER OF THE AUTHOR IN THE PROFILE?

Presenter(s): Herman, Nolan, Undergraduate, Sociology and Anthropology
Adams, Haley, Undergraduate, Psychology
Beckman, Kaley, Undergraduate, Sociology and Anthropology
Haislip, Nicole, Undergraduate, Sociology and Anthropology
Kuhn, Rory, Undergraduate, Psychology
Laux, Sydney, Undergraduate, Sociology and Anthropology
Spranger, Kinlee, Undergraduate, Sociology and Anthropology
Youngman, Dela, Undergraduate, Sociology and Anthropology

Mentor: Dr. Susan Sprecher

Authorship: Nolan Herman, Haley Adams, Kaley Beckman, Nicole Haislip, Rory Kuhn, Sydney Laux, Kinlee Spranger, Dela Youngman, Susan Sprecher

Dating platforms are a popular way in which couples meet (Nader et al. 2019; Rosenfeld, 2021). For example, the Pew Research Center reports that 3 in 10 Americans have utilized an online dating platform (Vogel & McClain 2023). The increasing popularity of online dating has led both users and researchers to question what statements in an online dating profile may appeal to other users and lead to attraction. Although the searching process may vary across dating platforms, most require users to create a profile that describes themselves and that may lead other users to find them appealing enough to message or respond to a message (Finkel et al. 2012). The purpose of our study is to examine the types of statements (presented in a hypothetical online dating profile) that would be judged to be most likely to lead to attraction by other users. We are also interested in whether the perceived desirability of statements depend on the gender of the hypothetical author. Data were obtained from 326 respondents from two universities and a Prolific sample (MAge = 23.94; 66.4% women). Participants completed an online survey where they were asked to rate 8 hypothetical statements on how they think online users might respond to the statement if included in a dating profile. The participants rated each statement on a 7-point response scale (1 = decrease attraction greatly; 4 = no effect; 7 = increase attraction greatly).

Participants were randomly assigned to imagine the author of the profile as either a young man or a young woman and indicate how those of the opposite gender would react to the statements. Preliminary results indicate that the most appealing statements referred to participation in sports, having a dog, and the presence of a healthy work-life balance. A statement about previous relationships was expected to have the least positive impact on the target's desirability. To examine whether the appeal of the statements differed based on the gender of the author, a series of independent t-tests were performed. The results demonstrated that for most of the statements, participants who thought the author was a male expected the information would lead to more attraction from other users than did participants who thought the author was a female. With dating

platforms becoming a popular way for couples to meet, the understanding of what profile statements are likely to increase attraction is useful to both users and future researchers.

THE SELECTION AGAINST WISDOM TEETH

Presenter(s): Kooistra, Rachael, Undergraduate, Sociology and Anthropology

Mentor: Dr. Shelby Putt

This survey investigates people's dental history with wisdom teeth and asks them such questions as to when they got them removed, how many wisdom teeth they had, and if they caused any pain. The main purpose is to find any correlation between the disappearance of wisdom teeth from the human dental record due to pain that they cause within people's mouths. I surveyed 100 people and asked those who did develop wisdom teeth if they were removed due to pain. The focus of this study was to see if the reduction of our jaw size has caused increased pain from the eruption of the third molars and if they are being selected against in our evolution. While it may not always be noticeable, the human body is always evolving. One way the body has changed from its earliest form is through teeth. Homo Erectus is when the dental record becomes more comparable to that of modern-day Homo Sapiens. The teeth that are the subject of this study are the third molars which include teeth 1, 16, 17, and 32. However, due to the change in morphology, the need for these third molars has decreased. In Homo Sapiens, these molars erupt between the ages of 18-24, meaning that they usually do not break through the gums of the maxillary or mandible until someone is at least 18. Presently, humans cook more food, which makes it softer, causing our jaw size to shrink. Due to the shrinkage of jaw size, it has been theorized that our third molars cause pain and crowding of teeth within the mouth and that is why they are removed. This was my theory prior to the survey; however, the results showed a different story. The majority of people did not get their wisdom teeth removed due to pain. In fact, most did not experience any pain due to their wisdom teeth. I concluded that people had their wisdom teeth removed before any pain could be felt. It is also important to note that 11% of people who took this survey never developed wisdom teeth. While 11% does not seem like a lot, out of 100 people that is over 1/10 of the participants and is a finding I would like to further investigate with a larger pool of participants.

THE ROLE OF SOCIAL IDENTITIES AND COMPASSIONATE LOVE IN PERCEPTIONS AND DETERMINATIONS OF TREATMENTS FOR A DRUG OFFENDER: A VIGNETTE STUDY

Presenter(s): Odeh, Yasmin, Graduate, Sociology and Anthropology

Mentor: Dr. Susan Sprecher

Co-Mentor: Dr. Justin Turner

Problem

The shift from a focus on rehabilitation to the more punitive, “tough on crime,” approach to illegal behavior in the U.S. has been enacted in no small way by policies connected to the use and abuse of drugs. The disparities between crack and powder cocaine—two chemically similar substances—have headlined this shift (Vagins and McCurdy 2006). However, research is scarce on laypeople’s approval of deterrence approaches for drug offenses, including as a function of types (e.g., powder vs. cocaine possession). This study examined people’s perceptions of prosecutorial decisions for drug offenders—whether they are punished, rehabilitated, or both—and whether people perceived the offenders differently based on their socioeconomic status (SES) and use of crack versus powder cocaine.

Procedure

A vignette study was conducted with approximately 250 college students. The vignette contained two stages. The first described the offender, including manipulations of the type of cocaine and the offender’s SES; the second revealed a court decision with three conditions—prison sentence, rehabilitation, or both. Dependent variables included the participants’ reactions to the target (e.g., recommended punishment in Stage 1; reaction to the hypothetical court decision in Stage 2). Individual difference variables of the participants, including political identity and their propensity to experience compassionate love (Sprecher and Fehr 2005), was also measured.

Analysis/Results

For stage 1, a 2 x 2 ANOVA will be conducted to examine the main effects of the MIVs (cocaine type and SES) and the interaction effect on participants’ reactions to the target in the vignette. For stage 2, a one-way ANOVA will be conducted to look at the main effect of the MIV (court decision) on participants’ reactions to the court decision. Variation in the participants’ reactions as a function of the type of offense, the SES of the target, and the participants’ characteristics (e.g., compassionate love for strangers), is expected. Data analysis is currently underway (findings are to be determined prior to the symposium).

Conclusions and Implications

This study seeks to examine how people perceive criminal justice approaches, specifically in the context of drug crimes, and how perceptions may differ based on individual difference variables, such as compassionate love, and it fills gaps in criminal justice and sociological literature pertaining to realistic judgments vis-a-vis the survey’s experimental design and its inspection of certain difference variables.

TEACHING AND LEARNING

HIP HOP AS TECHNOLOGY: A NEW MATERIALIST PERSPECTIVE

Presenter(s): Patel, Viraj

Mentor: Dr. Anna Smith

Authorship: Viraj Patel

As the preferred genre of music for 16–29-year-olds (Backus, 2022; Götting, 2021), Hip Hop music is used to supplement teaching and learning in two unique ways. First, artifacts of Hip Hop culture (lyrics, videos, graffiti etc.) serve as sites of analysis. For instance, in Kelly's (2023) high school ELA a student analyzed lyrics of *Chaining Day* by J. Cole to discover how metaphors can be used to articulate unique facets of materialism. Secondly, practices of Hip Hop serve as frameworks for teaching academic concepts. For instance, Rice (2003) used the principle of sampling to teach composition and writing practices to college students.

In this conceptual piece, I outline Hip Hop as a technology which augments the *processes* of teaching and learning. Pea (1985) defines cognitive technology as “any medium that helps transcend the limitations of the mind, such as memory, in activities of thinking, learning, and problem solving” (p. 168). As evident from examples above, Hip Hop serves this function.

However, as Shouse (2005) states “the pleasure that individuals derive from music has less to do with the communication of meaning, and far more to do with the way that a particular piece of music ‘moves’ them” (para 11). Hence, in this poster I employ the lens of New Materialisms (NMs) to argue that an examination of how Hip Hop generates affect or “moves” people augments contemporary understandings of the processes of teaching and learning.

First, I argue that Hip Hop music facilitates an entanglement (Barad, 2007) between students, teachers, and subject matters and actively disrupts an individual present and places it into a collective consciousness which serves as a new ground for teaching and learning.

Second, I show how a NMs approach to Hip Hop helps shift the focus of this entanglement from specific, predetermined products (e.g., assignments or assessments) to students and teachers' meaning-making processes. In this way, a NMs view of Hip Hop in the classroom highlights teaching and learning as verbs, not nouns.

Still, a NMs view of Hip Hop in the classroom has significant implications. Namely, the uncurated exposure to Hip Hop can be dangerous, and “run the risk of exacerbating, rather than challenging, existing biases and stereotypes of minoritized communities” (Kelly, 2023, p. 10). Hence, the use of Hip Hop to generate affect in the classroom requires continual ethical considerations from students as well as teachers.

TECHNOLOGY

STRATEGY IDENTIFICATION OF THE INTEGRATION OF DIVERSITY, EQUITY, BELONGING, AND INNOVATION IN THE CONSTRUCTION INDUSTRY

Presenter(s): Gandla, Sai Ram, Graduate, Information Technology

Mentor: Dr. H. Sally Xie, Technology

Numerical insights were developed for actionable strategies to promote Diversity, Equity, Belonging, and Innovation (DEBI) within construction education and the broader industry. However, the integration of DEBI in the industry lacks strategies to improve inclusivity within construction education and the professional sphere. This research plans to utilize questionnaires targeting both students and industry professionals and seek to shed light on the current state of DEBI. To pinpoint the areas for development, this research project started with literature review.

In addition to the wage disparities among different gender groups, the designed questionnaire survey will advocate for increased representation of underrepresented groups and aspire to foster an educational and professional environment that values diversity as a key component of innovation and success. One of the expected findings will be how instructors can invigorate an inclusive culture, transforming schools into welcoming communities. Another factor will revolve around teaching strategies and pedagogies aimed at enhancing student education and fostering professional learning communities. To ascertain the survey's psychometric attributes, we will conduct descriptive, exploratory factorial, and confirmatory factorial analyses. IRB review will be conducted. Then, during the trial phase, questionnaires will be sent through Qualtrics to the ISU community to learn the best practices and needs of DEBI in teaching and learning.

In conclusion, the findings highlight the urgent need for targeted DEBI initiatives in construction education and the industry at large. By integrating DEBI principles more thoroughly, we can work towards a construction sector that is not only more equitable and inclusive but also more capable of addressing the challenges of the modern world.

SYSTEM VALIDATION OF A VIRTUAL REALITY-BASED TEEN DRIVER TRAINING PROGRAM

Presenter(s): Gupta, Dolly, Graduate, Technology
Ji, Nathan, Graduate, Technology

Mentor: Dr. Isaac Chang

Authorship: Dolly Gupta, Nathan Ji

In collaboration with a prominent insurance company, we are developing an immersive, virtual reality (VR)-based driving simulator that can assess and analyze the driving habits of young drivers. Ensuring that this system is an effective tool for teen drivers requires the validation of its functionality. The validation process will involve the assessment of a driver utilizing a simulated environment and a route plan for standardized examination. The user will engage in multiple maneuvers and driving scenarios in the simulation, reflecting real-world situations and criteria on the “on-road examination” by Illinois’s Driver Test.

For this purpose, simulation data, including the virtual environment’s telematics (e.g., speed, torque, deceleration) and driving behaviors, will be collected. Combined with observations, the collected data will help validate the system's ability to reflect driving behaviors accurately. Our framework for validation will be based on the correlation between the proposed models and real-life driving situations. Once validated, this VR-based driver training program will boost the learning process for teen drivers and expand the potential use cases in low-risk training environments.