

2020 Symposium

Individual Abstracts – Morning Session

EFFORTS TOWARDS THE FORMAL ASYMMETRIC SYNTHESIS OF THE AKAJI HUMAN T-CELL LEUKEMIA VIRUS (HTLV-1) PROTEASE INHIBITOR

Presenter

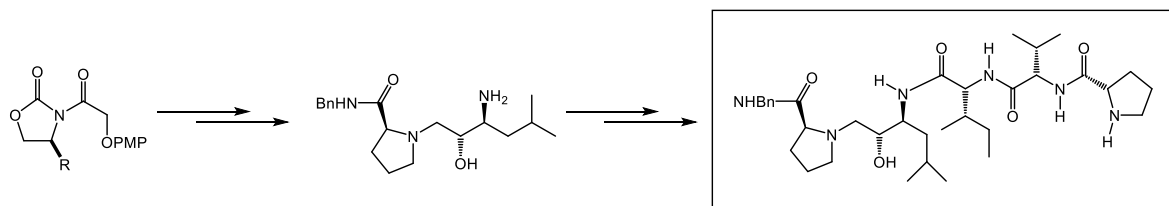
Addo, Marian

Graduate, Chemistry

Mentor

Prof. Shawn Hitchcock

The Human T cell leukemia virus (HTLV-1) was first isolated from patients with adult T cell leukemia/lymphoma (ATL) in the 1980s by researchers in both the United States and Japan. It was classified as the exclusive causative agent of ATL. HTLV-1 is a member of the deltaretrovirus family and has been established as the first retrovirus to directly be associated with human malignancy (cancer). It is estimated that 5-20 million people are infected with HTLV-1. HTLV-1 is endemic in southern Japan, parts of the Caribbean, most of Africa, South America, and is also be seen in a lower frequency over many other areas of the world. A commonality between HTLV-1 and other retroviruses is that it encodes a protease (PR) necessary for it to mature. In other retroviruses inhibition of the PR has shown to prevent the further spread of viral information. This makes the development of inhibitors specific to the HTLV-1 virus PR an attractive new direction for research. Compared to other retroviruses such as HIV, HTLV-1 has received very little attention with only a minimal literature occurrence. Building upon the work established by Aimoto and co-workers, Kenichi Akaji and co-workers were able to synthesize a protease inhibitor that successfully interacted with the Aimoto protease.



The synthesis of the Akaji protease inhibitor was accomplished by the use of chiral auxiliary methodology combined with solid phase support chemistry to allow for the protection of a secondary alcohol and the addition of the tripeptide at the β -amino position. We recently became interested in the asymmetric synthesis of the protease inhibitor for the HTLV-1 using a glycolate aldol addition route. This poster will summarize the work that has been carried out on developing an efficient synthesis of the Akaji protease inhibitor. The summary will include the work that was accomplished with a variety of glycolate aldol additions directed by oxazolidinone-2-thiones chiral auxiliaries. The aldol addition products that were obtained were reductively cleaved to generate the corresponding diol that was chemoselectively sulfonylated with toluenesulfonyl chloride. Treatment of this system with a variety of nucleophiles resulted in oxetane formation as the intermediate. The reactivity of the formed oxetane will be discussed as well as future plans for completing this body of work.

HUMAN SERVICE CENTER

Presenter	Alsip, Kamryn Graduate, Social Work
Mentor	Prof. Chris Gjesfjeld
Authors	Kamryn Alsip; Chris Gjesfjeld

The goal of this study is to see if the new individuals who are enrolling with ACT services are aware of their mental illness and if they display good insight on the purpose of the ACT team.

FREEDOM OF MEDIA AND ASSEMBLY DURING DEMOCRATIC EROSION: EXPERIENCE FROM BANGLADESH

Presenter

Almamun, Zunaid
Graduate, Politics and Government

Mentor

Prof. Yusuf Sarfati

Global democracy is in erosion for more than a decade. Bangladesh is also a part of this democratic erosion. Despite entering into the democratic regime in 1991, Bangladesh has experienced several democratic reversals during the first two decades after 1991, and finally, since 2014, democracy in Bangladesh is gradually eroding every year. Among many indicators of democratic erosion, scholars had focused less on the freedom of media and assembly, particularly since 2014, when the current government came to power through a less participatory election. In this research, I explore the experience of freedom of media and assembly during this democratic erosion and find how they have been affected in this period. I conclude that the absolute majority of the government in the parliament has resulted in using the parliament to enact repressive laws, being unaccountable for their actions such as tacit endorsement of violence on movements, promoting a culture of impunity that contributed to restricting the freedom of media and assembly in Bangladesh.

TEACHING MULTICULTURAL EDUCATION: ELEMENTARY TEACHERS' PERSPECTIVES AND PRACTICES IN INDONESIA

Presenter

Anggriawan, Robby
Graduate, Teaching and Learning

Mentor

Prof. Miranda Lin

The purpose of this research is to examine elementary teachers' perspectives and practices in implementing multicultural education in Indonesia. This qualitative study attends to ten elementary teachers' perspectives and practices of diversity and understanding of multicultural education. The address the following issues: (i) teachers' perspectives on the importance of multicultural education and (ii) how multicultural education is implemented in their schools, and the challenges faced in its implementation. The findings of this study can help elementary teachers reflect on their own practices and experiences and try to find means to tackle the challenges they face in implementing multicultural education. They can also provide valuable insights into teachers' perspectives which in turn can help administrators' decision making in curriculum and instruction.

BRAIN DEVELOPMENT AND COGNITIVE AND PSYCHOSOCIAL DEVELOPMENT IN ADOLESCENCE AND THEIR IMPLICATIONS FOR JUVENILE JUSTICE

Presenter	Arisman, Leah Undergraduate, Psychology
Mentor	Prof. Joanne Savage
Author	Leah Arisman

Adolescent brain systems are still developing. Research on adolescent brain development has recently been applied to the problems of juvenile delinquency and juvenile justice. In this paper, I will discuss brain structures such as the prefrontal cortex, the limbic system, and pruning of gray and expansion of white matter. Also, I will discuss how these structures affect and are related to cognitive and psycho-social development.

IMPACT OF RUNNING BIOMECHANICS INSTRUCTIONAL AND LABORATORY SESSIONS ON PROPER RUNNING GAIT COMPREHENSION IN ARMY ROTC CADETS

Presenter	Arnas, Erin Graduate, Kinesiology & Recreation
Mentor	Prof. Justin Stanek
Authors	Erin Arnas; Justin Stanek

Background: About 50% of United States Army Soldiers experience at least one injury per year with the majority of injuries being overuse injuries including strains, sprains, and stress fractures, particularly to the lower extremities. A multitude of studies have shown running with poor biomechanics, among other factors cause pain, inflammation and stress fractures to the lower extremities. Recent studies involving education have examined changes in biomechanics and injury incidence but and have failed to test the subjects' knowledge in an objective written examination. This study combines an educational lecture on proper running form and laboratory-like sessions. The researchers hypothesize that there will be an increased understanding of proper running form as a result of the lecture and laboratory sessions, with a secondary benefit of decreased lower extremity injury incidence in Reserve Officer Training Corps (ROTC) cadets.

Methods: 98 ROTC cadets ranging from 18-29 years old participated in an instructional workshop including a classroom session and a laboratory session focusing on proper running biomechanics over the course of one week. The cadets took one pre-test before the workshop, one post-test immediately following the workshop, and one post-test 15 weeks later to test the knowledge acquired throughout the process. Between post-test number one and post-test number two, the workshops were reinforced with six exercises that the cadets included as part of their warm-up. These exercises were designed to reinforce proper running biomechanical motions and prepare their bodies for long-distance running.

Results: Data is in the process of being analyzed at this time **Implications:** With the results from this study, we hope to determine the effectiveness of instructional sessions in ROTC cadets and potentially widen the content base to inform this group about a variety of wellness-based topics. Secondly, we hope the instruction on proper biomechanics of running will be adopted by the cadets, aiming to decrease overuse injuries overtime.

ADSORPTION BEHAVIOR OF CHARGE MODIFIED ANTIBODY ON GOLD NANOPARTICLES AND THE ROLE OF FREE SULFHYDRYL

Presenter	Awotunde, Awosiji Olatunde Graduate, Chemistry
Mentor	Prof. Jeremy Driskell
Co-Mentor	Prof. Craig McLauchlan
Authors	Olatunde Awotunde; Rishika Chikoti; Samuel Okyem; Jeremy Driskell

Adsorption of proteins to gold nanoparticles (AuNPs) and application of the resulting bioconjugates for diagnostics, therapeutics, and other biomedical applications have played a central role in early detections, prevention and treatment of many diseases. Our group and others have recently developed several AuNP-enabled immunoassays that rely on antibody-AuNP conjugates to selectively bind targeted antigens for detection. Improved sensitivity of these immunoassays can be enhanced by exploring the mechanisms of antibodies adsorption onto AuNPs for maximum binding to the antigens. Our group recently demonstrated that IgG has a stronger adsorption affinity to gold nanoparticles (AuNPs) than many other abundant blood plasma proteins, including fibrinogen, human serum albumin and transferrin. Nanoparticle tracking analysis (NTA) confirmed that IgG irreversibly binds to AuNPs and the adsorbed IgG is not displaced by other plasma proteins. The strength of the IgG-AuNP interaction goes beyond electrostatic attraction and is more consistent with chemisorption through the formation of Au-S bond between cysteine residues and a gold nanoparticle. We hypothesize that the number of free sulfhydryl groups present in a protein correlate with the protein-AuNP adsorption affinity. Moreover, we hypothesize that proteins containing free sulfhydryl groups are necessary to exhibit irreversible adsorption and to resist displacement by other proteins. In these subsequent studies, we are studying the ability of IgG to displace blood proteins adsorbed on AuNPs using complementary analytical techniques such as fluorescence, inductively coupled plasma optical emission spectrometry and UV-vis extinction spectrophotometry. Results of the protein exchange studies are correlated with the experimentally measured number of accessible free sulfhydryl groups to elucidate the role of Au-S bonds in the formation of stable protein-AuNP conjugates. Insight gained into the mechanism of protein-AuNP adsorption will aid in the development of a predictive model to synthesize stable, sensitive, and well-orientated bioconjugates for biomedical applications.

SYNTHESIS AND PRELIMINARY AQUEOUS KINETICS OF CARBINOLAMIDES DERIVED FROM N-METHYLPHTHALIMIDE

Presenter	Baas, Sabrina Undergraduate, Chemistry
Mentor	Prof. Richard Nagorski

The synthesis and preliminary aqueous kinetics of 3-phenyl-3-hydroxy-N-methylisoindolin-1-one derivatives (1) as a function of pH were the focus of this study. It is surprising to learn of the diverse roles that carbinolamide containing compounds have in a broad variety of venues. For example, an increasing number of compounds possessing this functionality have been discovered and are being developed that have interesting pharmaceutical applications. Carbinolamides have also been found to be intermediates in an array of biological venues with both positive and negative outcomes for the associated organism. An intriguing feature of the potential pharma compounds, isolated from natural sources, is the formation of carbinolamides from N-alkyl amide and ketone substrates. Synthetically, the majority of carbinolamides have been formed from aldehydes which are more electrophilic than ketones and form such compounds more easily. However, this has not hindered nature from providing a variety of examples incorporating these features. Reported here are the results of synthetic studies directed to the synthesis of carbinolamides from N-methylphthalimide and Grignard reagents. In addition, preliminary aqueous kinetics of these compounds, as a function of pH, were initiated, and those results will also be presented.

SPATIAL ANALYSIS OF MEDITERRANEAN MIGRANT ROUTES TO EUROPE

Presenter

Bachtold, Olivia

Undergraduate, Geography, Geology, and the Environment

Mentor

Prof. Michaelene Cox

Successfully integrating migrants into the European Union system has been one of the most difficult and controversial challenges within the Union. Since the migrant crisis peak in 2015, there has been a universal spotlight on the abundant migrant activity through the Mediterranean. A visual analysis of migrant route patterns within the Western, Central and Eastern Mediterranean Sea regions will allow one to see how the flow of migrants has fluctuated overtime due to policy changes in Europe. My research will focus on the spatial understanding of migrant demographic data through a cartographic lens.

MENTAL HEALTH & RESOURCES ON COLLEGE CAMPUSES

Presenter	Barfield, Bryan Graduate, Social Work
Mentor	Prof. Chris Gjesfjeld
Authors	Bryan Barfield; Chris Gjesfjeld

This study will look at the mental health needs of students living on campus at Illinois State University. In the study I will be looking at how cohorts experience mental health differently depending on generations; and if this generation experiences more mental health concerns, and what types of mental health concerns are more prominent. This includes me gathering information on main concerns that students struggle with on campuses. I will then look at the support systems and resources available on campus for college students, and if we have enough resources to address those concerns, and how often do college students utilize these resources. I will also gather information on who is utilizing these resources, and do we see a difference among race and gender in determine who seeks help for mental health. My hypothesis is while mental health concerns have increased, students are not using the resources available to them, and/or there are not enough resources on campus to address these concerns. Results are pending.

CONSCIENTIOUSNESS AND ACADEMIC PERFORMANCE: THE EFFECTS OF ACADEMICALLY RELATED BEHAVIORS

Presenter	Batsieva Regueros, Alexandra Graduate, Psychology
Mentor	Prof. Daniel Lannin
Authors	Alexandra Batsieva Regueros; Daniel Lannin

Purpose

This present study examined whether academic-related behaviors are responsible for the association between trait conscientiousness and undergraduate GPA. There is evidence that conscientiousness is a salient trait that predicts greater striving towards academic performance, as research has shown a consistent link between higher trait conscientiousness and higher GPA (Dollinger & Orf, 1991; Musgrace-Marquardt, Bromley & Dalley, 1997; Gray & Watson, 2002). Behaviors such as attendance have been shown to mediate the relationship between conscientiousness and GPA (Conard, 2006); however, less is known about the mediating role of other behaviors related to academic organization and engagement. Therefore, we hypothesized that conscientious students would exhibit more organizing and engaging academic behaviors which would result in better academic performance, such as a higher GPA.

Procedure

After obtaining informed consent, 239 undergraduates (24.3% = males, 74.1% = females; Age, $M = 19.79$, $SD = 2.45$; Race, 13.8% = African American, 2.5% = Asian American, 10.9% = Hispanic, 67.4% = White, 4.2% = Multiracial) completed an online survey that included self-reported GPA, nine self-reported trait conscientiousness items (BFI; John & Srivastava, 1999), and eight different academic behaviors (yes/no), which were factor analyzed (principle components analysis with promax rotation) and compiled into two factors: engaging academic behaviors (e.g., I have attended a review session or study session for a class in college) and organizing academic behaviors (e.g., When enrolled in a course, I usually read the entire syllabus).

Results

After standardizing all variables, results of a PROCESS (Hayes, 2017) mediation analysis indicated that the association between trait conscientiousness and GPA was partially explained by the positive link between conscientiousness and organizing academic behaviors ($\beta = .06$, $SE = .03$, 95% CI = [0.01, 0.11]), but not by engaging academic behaviors ($\beta = .00$, $SE = .01$, 95% CI = [-0.02, 0.02]). See Figure 1.

Conclusions

Results showed that students who score high on the conscientious trait tend to have a better GPA due to enacting more organizing academic behaviors such as having a daily planner, creating written to-do lists, responding to emails within 24 hours, and reading syllabi. More conscientious students may also engage with instructors more, but these behaviors appear to be less beneficial to their GPA. Results from this study may be helpful for intervention programs aimed at reinforcing organizing academic behavior in students from a young age.

FIRST REPORT OF A POTENTIAL MYCOSPORINE-LIKE AMINO ACID EXTRACTED FROM AGAVE: IMPLICATIONS FOR NEW SUNSCREEN ADDITIVES

Presenter	Biswell, McKenzie Graduate, Chemistry
Mentor	Prof. Marjorie Jones
Authors	McKenzie Biswell; Josh Jarodsky; Stephen Hughes; Marjorie Jones

Mycosporine-like amino acids (MAAs) are of interest due to their UV defensive properties which, if isolated, could be used as natural, non-toxic, environmentally friendly alternatives to chemicals of sunscreens currently in use. The compounds oxybenzone and octinoxate currently in sunscreens end up being absorbed by some organisms. A prime example of this is the ocean's coral reefs; the absorption of these chemicals end up 'bleaching' the coral reefs leaving them susceptible to diseases. Agave has been chosen for this project since, in the production of tequila, only about 1/3 of the 150-pound plant is used. The remaining 2/3 of the plant is discarded as biowaste. Therefore, finding a use for the rest of the plant, such as ethanol production and specialty molecule (natural product) isolation, would cut down on the biowaste accumulated. Starting with an initial weight of 25.611 g the agave leaves were subjected to a 48-hour aqueous solvent extraction (5 °C); then the mixture was filtered to remove all solids. The agave extract was then lyophilized to remove water, and an organic mass of 1.845 g (7.2 % yield) was obtained. The next step was thin-layer chromatography which indicated 3 spots, with the major one being ninhydrin positive. UV/Vis spectroscopy indicated an absorbance peak at 362 nm. Through these techniques, Euhalothece-362 is tentatively identified as the major MAA molecule extracted from the Agave leaves. Pending work includes further purification via reverse-phase column chromatography, followed by characterization by High-Resolution Mass Spectroscopy, as well as studies testing the effects of Euhalothece-362 to reduce UVA/ UVB radiation damage to cells in culture.

HOW SOCIAL WORK SERVICES ARE PERCEIVED BY TEACHERS, ADMINISTRATORS, AND SUPPORT STAFF AT LINCOLN COMMUNITY HIGH SCHOOL

Presenter

Bland, Hannah
Graduate, Social Work

Mentor

Prof. Kate Sheridan

This explored the perceptions of teachers and staff at Lincoln Community High School regarding social work services. Participants in the study were adults aged 18 years of age or older who are employed by Lincoln Community HS as teachers or other staff (for example, paraprofessionals, administrators). Instruments included an electronic survey disseminated via Qualtrics. Findings will inform improvements to the provision of social work services at the high school.

WILSON READING PROGRAM

Presenter	Block, Tammy Graduate, Special Education
Mentor	Prof. Mark Zablocki
Author	Mark Zablocki

The purpose of this action research project is to analyze if a multisensory structured literacy approach to teach second grade students with learning disabilities to read is effective. Specifically, the following research question will be addressed: Is the Wilson Reading System (WRS) effective in increasing reading achievement for elementary students with learning disabilities? Many multisensory structured literacy programs have been identified as evidence-based reading interventions. An evidence-based reading intervention is defined by Al Otaiba, Rouse, & Baker (2018) as a program that has been tested empirically to demonstrate that there is evidence of their efficacy for struggling readers or students with learning disabilities across multiple research studies, students, and settings. When treating students with reading disabilities in particular, a number of elements should be taken into account. Early literacy essentials include phonemic awareness, phonics, fluency, vocabulary and comprehension (Magpuri-Lavell, Paige, Williams, Akins, & Cameron, 2014). Basic reading skills include the ability to identify letter-sound correspondences, to consciously manipulate sounds in different ways (i.e. segment, blend, and delete sounds), to rapidly decode and identify words, to recognize words' meanings in written texts, and to construct meaning from sentences, paragraphs, and longer texts (Giess, Rivers, Kennedy, & Lombardino, 2012). In a previous study (Stebbins, et al. (2012) found that participants' reading scores increased significantly after receiving WRS instruction.

INVESTIGATING HETEROLOGOUS EXPRESSION OF A CAS9 TRANSGENE IN NEUROSPORA CRASSA

Presenter

Burrell, Natalie

Graduate, Biological Sciences

Mentor

Prof. Tom Hammond

The CRISPR-Cas9 system gives scientists endless opportunities to accomplish specific genome editing. The system requires the introduction of a protein called Cas9 into the target organism. A successful approach to introduce Cas9 in several organisms is through heterologous expression with a cas9 transgene. We provide evidence that a human-optimized version of cas9 is poorly expressed in the model fungus *Neurospora crassa*. With the attachment of GFP, a fluorescent protein, to various locations within the cas9 transgene, we found that fragments of the transgene are expressed in this organism. Our current dataset suggests that there are at least two elements contained in the cas9 transgene limiting its expression, with one element located near the 5' end and another element located near the 3' end of the transgene. Our future work seeks to understand why these regions negatively influence the expression of cas9 in *N. crassa*.

PROGRAM EVALUATION OF STRENGTH AT HOME

Presenter	Butler, Brianna Graduate, Social Work
Mentor	Prof. Kate Sheridan

The purpose of this program evaluation is to determine the effectiveness of Strength at Home and its ability to help Veterans establish healthy techniques for solving intimate partner violence/issues.

PERFORMING COLOR: PARTICIPATORY PHOTO AND COMMUNITY BASED RESEARCH IN A MODERN U.S. CIRCUS

Presenter	Campbell, Radiance
	Undergraduate, Sociology/Anthropology
Mentor	Prof. Thomas Gerschick

This study asks "what is the experience of people of color in the modern U.S. circus?" and is primarily concerned with granting performers of color control over telling their own story. Given that the circus is a visual art, this study produces visual research that centers participants' perspectives through photo voice, or participatory photo, which is a visual research methodology that uses participant-generated photos as data. Participants were given disposable cameras and encouraged to photograph their own worlds, identifying the assets and challenges of their circus community. Through qualitative photo-elicitation interviews and a focus group, together we created a space for deep discussion and collaboration as we developed a collective message to share. Select participant-generated photographs are included in the research publication and are being displayed in the culminating exhibit at Illinois State University's Rachel Cooper Gallery from February 25th to May 8th, 2020.

Because of the impact of spectatorship on performers of color, this exhibition creates space for the wider community to engage with research results while simultaneously asserting the performers' right to a self-determined public narrative. The exhibition along with participants' increased consciousness is part of the empowerment process at the core of this project. Visual research methodologies and the culminating exhibition were chosen for this project because they constitute an empowering form of research while producing results that are more accessible to the non-academic audiences that often directly influence the lives of performers of color. An optional "exit survey" was available at the gallery's opening reception on February 25th and was analyzed to help gauge audience's interaction, understanding, and learning from the exhibition.

A VISUAL EXPLORATION OF ECONOMIC INSECURITY IN MUMBAI, INDIA

Presenter

Catezone, Cristina

Undergraduate, Politics and Government

Mentor

Prof. Michaelene Cox

What strategies are lacking in Mumbai, India that could protect individuals from economic insecurity? This analysis of images derived from databases portrays the multiple dimensions of human security/insecurity that much of the population in Mumbai faces daily at the local level. Human security studies are a shift in interdisciplinary frameworks as it focuses on threats at the local and individual level including the often-linked discussions about freedom from want and freedom from fear. There are a few studies that employ an arts-based research methodology to examine possible initial causes, actors, and certain initiatives that deal with human security concerns in Mumbai, India. All in all, this project includes captioned photographs and narratives to present viewers with a unique perspective of this ongoing phenomena. This will also incorporate the subjective nature in determining who defines security/insecurity, what it constitutes with, and who is at risk.

DIRECT AND INDIRECT EFFECTS OF THE HEMIPARASITE *PEDICULARIS CANADENSIS* ON INVASION OF A PRAIRIE COMMUNITY BY *LESPEDEZA CUNEATA*

Presenter	Cazzato, Karly Undergraduate, Biological Sciences
Mentor	Prof. Victoria Borowicz
Co-Mentor	Prof. Steven Juliano
Authors	Karly Cazzato; Victoria Borowicz; Steven Juliano; Tim Martin

The factors contributing to successful invasion and impacts on native species by non-native organisms remain an important topic for understanding ecology in human-dominated landscapes. A prominent hypothesis is that species and functional diversity of the invaded community contribute to the resistance of the community to successful invasion and reduce impacts of invaders. The direct and indirect pathways by which species and functional diversity have these effects remain mostly unknown. Hemiparasites as a functional group are photosynthetic plants that parasitize the roots of other plants, drawing water and mineral nutrition from their hosts. Hemiparasites as a functional group that exploits other plants can have important effects on plant community composition and diversity. We investigated the direct and indirect effects of the hemiparasite *Pedicularis canadensis* on invasion of Midwestern prairie communities by the legume *Lespedeza cuneata*. We used structural equation modeling to test hypotheses that: 1) *P. canadensis* indirectly enhances invasion success of *L. cuneata* by suppressing dominant grasses and forbs; 2) Species richness (excluding *P. canadensis*) reduces invasion success of *L. cuneata*; 3) *P. canadensis* indirectly affects community composition by increasing soil N via concentrating nutrients in its litter; and 4) *P. canadensis* affects soil microbial community composition and diversity. We obtained data from 96 experimental plots on abundances of grasses, forbs, native legumes, *L. cuneata*, and *P. canadensis*. We also quantified for each plot abundances of soil nutrients (nitrogen, phosphorus, and pH) and soil microorganism activity and functional diversity with EcoPlates™. We are using path analysis, which is similar to multiple regression but which allows variables to be both caused by other variables and to have causal effects on other variables, to test for the direct and indirect effects of diversity, plant functional group abundances, soil nutrients, and microbial variables on *L. cuneata* abundances.

VICTIM'S OF TRAUMATIC EVENTS PERCEPTION OF POLICE

Presenter

Chang, Franklin

Graduate, Criminal Justice Sciences

Mentor

Prof. Ashley Farmer

Authors

Franklin Chang; Ashley Farmer

The goal of this study is to gain a survivors/victim's perspective on how they would evaluate police. This insight will help police gauge how they interact with those who have experienced traumatic situations and change protocol based on the findings of this research.

INTERACTIVE EFFECTS OF PARASITIC BURDEN AND NUTRITION ON AEDES ALBOPICTUS HOSTS

Presenter	Chappell, Kasie Undergraduate, Biological Sciences
Mentor	Prof. Steven Juliano
Co-Mentor	Kristina McIntire
Authors	Kasie Chappell; Kristina McIntire; Steven Juliano

The invasive mosquito *Aedes albopictus* is commonly infected by the protozoan parasite *Ascogregarina taiwanensis*. Infection by *Ascogregarina* affects the physiological development of the host, prolonging development time and decreasing fecundity, potentially impacting population dynamics. Parasite burden in this system is correlated with host exposure to parasite oocysts in the environment, with increasing host exposure to the parasite leading to increased parasite burden in the host. These negative effects of infection have the potential to be mediated by nutrition of the host. We investigated the hypothesis that reduced food availability to the host will increase impacts of infection on host growth and development, resulting in greater reductions in fitness of the host. We exposed the host, *A. albopictus*, to zero, low, and high doses of *A. taiwanensis* oocysts and three food levels. Randomly selected larval and adult hosts were dissected to determine infection prevalence and burden as measures of parasite fitness. Survivorship, development time, and wing size of adults were recorded as measures of host fitness. Ovaries of blood-fed females were dissected to determine egg production. Hosts with exposure to lower *Ascogregarina* dosage and lower food are predicted to experience a moderate burden while higher food should yield less of a burden. Higher *Ascogregarina* exposure and low nutrient levels should experience the greatest burden, lowest host survivorship, and the lowest egg production. This work provides important insight into the interplay of host nutrition and parasitic infection, with the potential for alteration in host population dynamics in this invasive and important vector of human disease, while also providing broader background into potential factors affecting invasive species and their parasites.

EMPLOYING 3D PRINTED CARTRIDGES FOR SIMPLE AND EFFECTIVE SURFACE TRANSFER SWABBING FOR PSI-MS INVESTIGATION

Presenter	Clowser, Phoebe Undergraduate, Chemistry
Mentor	Prof. Christopher Mulligan
Authors	Phoebe Clowser; Trevor McDaniel; Noah McClurg; Christopher Mulligan

The pursuit of field-based, forensic evidence processing has led to the development of analytical methods that are both portable and highly selective, such as paper spray ionization-mass spectrometry (PSI-MS) coupled to fieldable MS systems. While shown highly capable for bulk drug evidence screening, application of PSI-MS towards trace residue screening via surface swabbing can be hindered by substrate damage or burdensome operation by non-technical operators. In this work, the analytical performance and durability of 3D printed cartridges that serve as both the surface sampling device and PSI-based ionization source is assessed, employing common and emerging drug analytes and surfaces of interest to forensic investigations.

PSI-MS employs a triangularly cut paper substrate as a disposable ionization source that utilizes ESI-like processes to ionize present analyte. In these studies, various designs of cartridge-based PSI sources (which house triangular paper inserts) were designed and printed via polypropylene-based 3D printing methods. All MS experiments were conducted on a FLIR Systems AI-MS 1.2 portable ion trap MS system ruggedized for field use. Drug standards utilized in this work were purchased from Cerilliant, diluted as needed, and deposited onto surfaces of interest to produce residues of known mass interest.

RESTORATIVE JUSTICE PRACTICES WITHIN THE UNIT 5 SCHOOL DISTRICT JUNIOR HIGH SCHOOLS

Presenter	Cobb, Troy Graduate, Social Work
Mentor	Prof. Kate Sheridan

This study explored the implementation of restorative justice practices within the 4 middle schools of the Unit 5 school district including Parkside Junior High, Kingsley Junior High, Evans Junior High and Chiddix Junior High schools. Participants are adults aged 18 years of age or older who are teachers, administrators, and paraprofessionals (guidance counselors, social workers, psychologist, counselors/interventionist, school resource officer) currently employed at any of the 4 junior high schools. Approximately 300 individuals have been invited to participate. Participants are invited to complete a 17 item survey taking less than 10 minutes to complete which was disseminated via Qualtrics. The survey explores practices used by staff in implementing restorative justice with students as well as obstacles to its use in middle school. Findings will inform changes to restorative justice practices across Unit 5 middle schools.

PARENT BEHAVIORS DURING SHARED BOOK READING

Presenter	Coduto, Julia Undergraduate, Communication Sciences and Disorders
Mentor	Prof. Ciera Lorio
Authors	Jacqueline Towson; Peggy Gallagher; Grover Whitehurst; Andrea Zevenbergen

Interactive shared book reading includes parent-child interaction and conversation revolving around children's books (WWC, 2007b). This style of book reading provides multiple, enhanced opportunities for building language and literacy skills. Parents can use dialogic reading strategies such as prompting, evaluating, expanding, and repeating (PEER) as well as prompts targeting completion, recall, open-ended responses, wh-questions, and distancing (CROWD) (Zevenbergen & Whitehurst, 2003). Research on interactive shared book reading has shown positive relationships with expressive and receptive language outcomes (Towson & Gallagher, 2014; WWC, 2007b) but these studies primarily include parents and children older than 3 years. Little is known about the shared book reading behaviors of parents and their children under the age of 3. The aforementioned methods of CROWD and PEER have been found to support language development in preschool-age children (WWC, 2007a); however, it is unclear whether or how often parents of very young children use them and how they can be effectively used by parents to support language and literacy development infants and toddlers.

This poster includes preliminary data on observed parent behaviors during shared book reading interactions with infants and toddlers. Data are from a longitudinal study that aims to examine shared book reading interactions between parents and their infants/toddlers, following children from 6 months to 36 months of age. The study currently includes 23 families and a total of 76 videos. The student presenter will provide a summary of parent behavior coding scheme and compare the frequencies of different parent behaviors across various ages of infants/toddlers.

THE FARM MANAGEMENT DECISION-MAKING PROCESS

Presenter	Conaty, Garrett Undergraduate, Agriculture
Mentor	Prof. Maria Boerngen
Author	Garrett Conaty

Farm managers typically work for farmland owners who are not actively involved in farming operations. For example, most farm managers are involved in farm income tax paperwork; fertilizer, seed, and chemical recommendations; and conservation practice decisions. I am researching the processes farm managers go through to make these decisions for individual farms. I am specifically interested in the process that goes into deciding what farms to rent to what tenants, how much to rent it out for, and the different terms of contracts (i.e., upkeep practices for each farm). To complete my research, I will be job shadowing multiple accredited farm managers through the Illinois Society of Professional Farm Managers and Rural Appraisers (ISPFMRA).

THE LOST GENERATION: THE EFFECTS OF THE 2008 FINANCIAL CRISIS ON ARTS EDUCATION

Presenter	Corbin, Demitri Graduate, Theatre and Dance
Mentor	Prof. Kee-Yoon Nahm
Co-Mentor	Prof. Bruce Burningham

The arts are an essential component to a child's intellectual development. Its inclusion in education goes back to the origins of Western civilization. Decades of scientific research give testimony to the arts being an influential tool for delivering common core curriculum to those deemed at-risk of failure in the most vulnerable sectors of the US population. Yet for all its attributes, the arts are the victims of budget cuts and are of low priority in this age of accountability. For many of those at risk, their only exposure to the arts is in school. The economic crisis of 2008 all but wiped out that exposure, leaving the current generation of potential arts consumers - college-aged students - just now experiencing their very first play, concert, dance recital or art exhibition. How can arts organizations cultivate consumers from a generation that has had little to no exposure to the arts? And further, how can arts education be ensured for future generations? By looking at arts education through its historical, political, socio-economic and cultural contexts, this paper will attempt to address these questions.

TEMPORAL CHARACTERISTICS OF OROPHARYNGEAL SWALLOWING IN MULTIPLE SYSTEM ATROPHY: A LONGITUDINAL STUDY

Presenter Cornejo, Savannah
Undergraduate, Communication Sciences and Disorders
Mentor Prof. Taeok Park

Multiple System Atrophy (MSA) can be defined as a sporadic neurodegenerative disorder. MSA characteristics include bilateral involvement, bradykinesia, impaired writing, slurred speech, and rigidity. Muscular weakness is a major clinical feature of myotonic dystrophy. Bradykinesia and rigidity affect the motor function of the tongue which can cause dysphagia. Oral-related symptoms such as drooling, sensory changes in the oral cavity, difficulty in chewing, and dry mouth are present in MSA. Also, delayed pharyngeal swallow, penetration, and aspiration are present.

The purpose of this longitudinal study was to determine temporal characteristics changes of swallowing in a patient with MSA in order to better understand how the swallowing mechanism is directly affected from this neurogenic disease. The participant included a 60-year-old male who was diagnosed with MSA in 2009. Over the course of six evaluations, 1/21/2013-6/16/2014, a video fluoroscopic swallow examination (VFSE) procedure was performed for 5 different boluses. The types of bolus and volumes included 2mL thin liquid, 5mL thin liquid, thick liquid, puree, and pudding.

To measure temporal characteristics, each swallow was analyzed for the following points: onset of posterior movement of bolus, bolus head passing the ramus of mandible, initial opening of UES, tail of bolus passing the UES, initiation of maximal excursion of hyoid, first contact of arytenoid and epiglottis, and the final contact of arytenoids and epiglottis. The temporal measurements included Oral Transit Time (OTT), Pharyngeal Transit Time (PTT), Duration of UES Opening (DUESO), Stage Transition Duration (STD), Initiation of Laryngeal Closure (ILC), and Laryngeal Closure Duration (LCD). The average time in seconds per each kind of bolus were compared to normative data.

Overall the temporal characteristics of the swallow were different in comparison with the normative data. Evaluations showed prolonged bolus transition in the oral and pharyngeal stage across all consistencies due to rigid and stiff musculature of the oral and pharyngeal structures and also delayed initiation of laryngeal closure (ILC) which is related to risk of aspiration. Utilizing these measurements helped to determine how MSA was affecting the swallowing mechanisms individually. Since MSA is a progressive disease there must be follow-up evaluations to look at long-term proponents. Dysphagia management will help maintain function of swallow.

STIGMATIZED IDENTITIES AND MENTAL ILLNESS: A CROSS CULTURAL STUDY

Presenter

Corona, John

Graduate, Sociology/Anthropology

Mentor

Prof. Gina Hunter

In this paper I will explore social and cultural understandings of mental health and how that translates to identity and the element of power in creating such identities. I will outline some of the social and cultural constructions of mental illness cross culturally. For example, the social and cultural aspects of mental health and distribution of various mental health issues from recent research and interdisciplinary literature on mental health. I will discuss the western development of mental illness categories (bio-based explanations) and the rise of psychiatry as a framework for its understanding. A focus of this work will be a review social stigma of mental illness to gain a deeper understanding of the social aspects in mental health. Lastly, I will explain the impact of perceptions of mental illness and the power of creating identities in marginalized groups and the role of stigma. More specifically, how people in a marginalized status experience mental health issues and how that shapes their decisions to seek treatment.

SMALL-TOWN LIVING: DO ILLINOIS UNIVERSITIES UNDERSTAND THE RURAL COLLEGE STUDENT?

Presenter

Dalmasso, Erik

Graduate, Educational Administration & Foundations

Mentor

Prof. Elizabeth Lugg

Rural students are confronted with unique challenges when considering postsecondary choices. According to McShane and Smarick (2018), scholarship on this overarching issue is limited, as it is "often shunted to specialized journals that have not been able to integrate findings into the broader education policy conversation" (p. 1). Rural students, and to a broader extent, rural education have little voice in the postsecondary pathways that have been created within higher education (Goldman, 2019). Recruitment of rural students, financial aid policy, remediation/developmental programming, state and federal postsecondary legislation have largely treated rural students in tandem with their urban and suburban peers, when research has shown many of their challenges to be fundamentally different (Tieken, 2016). This dissertation seeks to understand, through narrative historical analysis, how Illinois state higher education policy and structure, Federal higher education policy, state university chartered purpose and state higher education legislation has helped or harmed a rural student's ability to matriculate to a post-secondary future.

VICARIOUS RESILIENCE IN SOCIAL WORKERS

Presenter	Darby-Ince, Cassandra Graduate, Social Work
Mentor	Prof. Chris Gjesfjeld

Social workers are often informed of vicarious trauma when working with trauma. However, when using a strengths-based lens to view trauma work, social workers should also be informed of potential benefits when working with clients, also known as vicarious resilience. Gaps in research appear to occur in how to promote resilience and deliver a more strengths-based approach to clinicians to educate and enhance vicarious resilience. The aim of this study is to examine the resiliency of experienced clinicians in the field of social work, how agencies can best support vicarious resiliency, and enhancing self-care strategies in clinicians.

Participants will be therapists and supervisors over the age of 18 years old currently practicing in the field at a local child welfare agency in Peoria, Illinois. They will be selected based on the number of years of experience in the field, with a minimum of five years being required. The researcher will meet with participants individually for semi-structured interviews.

DO RACE AND SPIRITUALITY INFLUENCE THE USE OF HOSPICE SERVICES AND END OF LIFE DECISIONS?

Presenter	Dehm, Summer Graduate, Social Work
Mentor	Prof. Chris Gjesfjeld
Authors	Summer Dehm; Chris Gjesfjeld

My research will be looking at African American pastors and White pastors and their views regarding hospice care. I want to know the possible differences in how they perceive hospice services and how they feel they impact their congregation in regards to end of life decisions. I will be researching how hospice may or may not align with their religious values and how comfortable they are discussing death and dying with their congregations. My goal in gaining this knowledge is to be able to provide my internship agency with this information so they are better able to inform potential clients on what hospice is, in hopes to create more diversity in patients within the agency. If hospice workers are informed of the impact that race and spirituality play in clients medical decisions, then they will be better able to serve minority clients.

DETERMINING OF COLOR VISION IN THE MARBLED CRAYFISH, *PROCAMBARUS VIRGINALIS*

Presenter	DeMaegd, Margaret
	Graduate, Biological Sciences
Mentor	Prof. Wolfgang Stein

Marbled crayfish, *Procambarus virginalis*, are a high invasive species of clonal crayfish that are growing in numbers around the world and pressuring native species in diverse communities. Their habitats have a wide variety of water opacity, ranging from clear waters in Germany, to murky rice fields in Madagascar. Crayfish species living in clear waters have been shown to use color vision to navigate and detect environmental cues and potential predators. The extent to which marbled crayfish use color vision is unknown in part because the visual acuity and the color range they respond to are not well understood. Color is detected by the differential activation of photoreceptors in the eye. These photoreceptors are tuned to specific light wavelengths that are determined by the expression of light-sensitive g-protein coupled receptors called rhodopsins. Here, I first used a bioinformatics approach to identify putative rhodopsin genes present in the marbled crayfish genome. I found homologs of both the short and long wavelength rhodopsins expressed in *Procambarus clarkii*, a closely related species of crayfish in the marbled crayfish genome. This indicates that the color range of the marbled crayfish may extend from ~400nm (ultra violet) to ~700nm (far red). To determine if this range was accurate, I performed an electroretinogram using excised marbled crayfish eyes. This analysis supported the bioinformatics in that photoreceptor activation ranged from 350nm to 685nm. Additionally, they show a maximum response at 525nm, similar to other *Procambarus* species. Finally, to determine whether light color affects marbled crayfish locomotion. Specifically, I assessed changes in thigmotaxis, velocity, and distance. Animals were exposed to one of four light colors (red, green, yellow, and white to represent natural activation by sunlight) and allowed to freely locomote in a large circular arena for three hours. We are currently assessing whether light color affects locomotion parameters of these animals. Together, these data suggest that crayfish are responsive to colored light and thus may use color vision as a strategy to navigate their environment.

SUPPORTING FOSTER PARENTS OF BEHAVIORALLY SPECIALIZED CHILDREN

Presenter	Dentino, Christine Graduate, Social Work
Mentor	Prof. Chris Gjesfjeld
Author	Christine Dentino

I am focusing my research primarily on foster parents with behaviorally specialized children placed in their home. My goal is to identify strengths and gaps in service that foster parents with specialized children in order to improve foster parent support in order to stabilize foster children in their placements. I will be sending specialized foster parents anonymous surveys in which they rate their satisfaction of the current types of support the POS foster care agency provides, as well as provide them an opportunity to make suggestions on what they need additionally from the agency.

THE ROLE OF ANXIETY IN EMOTIONALLY EXPRESSIVE FACIAL RECOGNITION MEMORY

Presenter	DeVore, Amanda Graduate, Psychology
Mentor	Prof. Dawn McBride
Author	Amanda DeVore

Considering the mixed results in on-going facial recognition memory research with regard to emotional expression, it is of utmost interest to discover the root of the differences in emotionally expressive face processing. One possibility being considered is an influence of anxiety levels in participants that can affect processing style during encoding. To clarify the role of anxiety in these processes, a study was designed to include a measure of those symptoms at subclinical levels. Specifically, an anxiety survey will be included in a study that examines facial recognition of happy and angry faces at immediate and delayed tests. It is hypothesized that the manipulation of processing style (global versus local processing) at study minimizes biases for negative emotionally expressive faces in individuals experiencing anxiety symptoms, thereby amplifying the exhibited decrease in memory for these faces overall at delayed tests. This result would suggest an interaction between current emotional state and emotional expression in facial recognition.

EFFECT OF POLYMER CROSS-LINKING DENSITY ON THE STRUCTURE AND CATALYTIC PROPERTY OF ENCAPSULATED GOLD NANOPARTICLES

Presenter	Egemole, Franklin Graduate, Chemistry
Mentor	Prof. Jun-Hyun Kim
Authors	Franklin Egemole; Pascal Eyimegwu; Luke Ludwig; Jaehan Yun; Jun-Hyun Kim

This work demonstrates the systematic control of the density of polymer particle network that can impact the structural feature of encapsulated gold nanoparticles and their catalytic functions in homocoupling reactions. The percentage of the methylene bisacrylamide crosslinker was varied between 5% and 40% during the synthesis of poly(N-isopropylacrylamide) polymer particles. Subsequent reduction of gold ions in the presence of these polymer particles greatly influence the structure of encapsulated gold nanoparticles. In addition, these composite particles used as catalysts in homocoupling of phenylboronic acid gradually increased the yield of product as the percentage of the cross-linker decreased. Investigating the formation of catalytically active nanoparticles and their structure-dependent properties in a controlled polymer particle network will lead to the development of novel catalytic systems with greatly improved reactivity and selectivity.

THE LIKELIHOOD FOR OVERCOMPENSATION IN THE FIELD FOR AEDES MOSQUITOES

Presenter	Evans, Katherine Graduate, Biological Sciences
Mentor	Prof. Steven Juliano
Authors	Katherine Evans; Brendan Holly; Joseph Neale; Steven Juliano

The number of individuals in a competitive environment can affect the growth rate, survival, size, and fecundity of those individuals, which is known as density-dependent effects. Overcompensation may occur if few juveniles survive to adulthood in a high-density environment. Overcompensation arises when density dependent survival interacts with extrinsic sources of mortality, such that more juveniles survive to adulthood than if no extrinsic mortality had occurred.

I tested the hypothesis that density dependent effects are common and strong in the field for three mosquito species: *Aedes aegypti*, *Aedes albopictus*, and *Aedes triseriatus*. I surveyed naturally occurring densities in novel and established field containers, then introduced larvae at similar densities and censused the containers for survivors. The results indicated that either compensation or overcompensation would have been likely to occur at higher densities, for some of the sites and times tested, for each species.

STUDENT COUNSELING SERVICES HCC

Presenter	Evett, Alyssa Graduate, Social Work
Mentor	Prof. Kate Sheridan

This study compares demographic and treatment variables among campus counseling center clients from Heartland Community College to students attending other colleges and universities in the US. Specifically, the study examines race, ethnicity, gender identity, presenting problem, overall number of students served, number of group or individual appointments, and suicide risk among students who received counseling services from July 1 2017 to June 30 2018. Findings will inform program planning at HCC Counseling Center.

DYNAMIC TERMINAL INVESTMENT IN MALE BURYING BEETLES

Presenter	Farchmin, Paige Graduate, Biological Sciences
Mentor	Prof. Scott Sakaluk
Co-Mentor	Prof. Anne-Katrin Eggert
Authors	Paige Farchmin; Anne-Katrin Eggert; Kristin Duffield; Scott Sakaluk

Animals often increase their investment in reproduction in response to a threat to their immediate survival (e.g. an infection), a life history strategy known as terminal investment. The dynamic terminal investment threshold model proposes that the tendency of an individual to terminally invest depends on other factors, such as age, that alter an individual's residual reproductive value. Here, we test the dynamic terminal investment model in burying beetles, insects that bury small vertebrate carcasses as a source of food for their young and that provide extensive biparental care. We injected males at two different ages with heat-killed bacteria and measured their reproductive effort, predicting that immune-challenged males would show a longer period of parental care, consume less of the carcass, and produce a greater number of larvae in the current reproductive attempt compared with control males. We further predicted that terminal investment would be more likely to be exhibited by older males than younger ones. Males, when challenged with heat-killed bacteria as virgins prior to their first reproductive attempt, did not terminally invest, whereas these same individuals when challenged in a subsequent reproductive bout produced a greater number of offspring. Older, immune-challenged individuals gained less mass during their time on the carcass than control males, suggesting that this terminal investment was subsidized by their consuming less of the carcass than they might have otherwise done in the absence of an immune challenge, leaving more carrion for their offspring to consume at the expense of their own future reproduction. We conclude, therefore, that the age-specific terminal investment shown by immune-challenged males in the current study supports the dynamic terminal investment model.

REASONING ON MUSIC LISTENING IN ABSORPTION

Presenter	Feltner-Williams, Destiny Undergraduate, Psychology
Mentor	Prof. Jeffrey Kahn
Author	Destiny Feltner-Williams

Music listening has become a part of people's everyday lives. With various reasons on why people like to listen to music, research on how absorption relates to the psychological reasons behind music listening have not been fully investigated. Absorption in music is the ability to let one self have a strong emotional response to music (Sandstrom & Russo, 2011). This includes having full attention with no distractions, while listening to music. Sandstrom and Russo (2011) created the Absorption in Music Scale (AIMS) that measures individuals' absorption. The purpose of this research was to see if absorption in music correlates with the Big Three functions of music listening that Schäfer, Sedlmeier, Städtler, and Huron (2013) proposed: self-awareness, social relatedness, and arousal and mood regulation. I hypothesized that absorption would be most positively correlated with the self-awareness function, due to the absorption statements that Schäfer et al. (2013) listed in that category. I hypothesized that absorption would be positively correlated with the arousal and mood regulation function, because Sandstrom and Russo (2011) discussed the correlation between absorption and the influence music has on mood. Finally, I hypothesized that the social relatedness function would be negatively correlated to absorption, because absorption is focused more on the individual, rather than the social aspect.

This study includes administrating a survey to college students in return for extra credit. We incorporated the AIMS in the survey, in order to measure participants level of absorption. Also, we implemented survey questions that were used in assessing The Big Three functions, to establish the reasons on why people listen to music. The findings of this study will help us understand how people's emotional response to music relates to reasons why people listen to music.

ESTABLISHING RAPPORT IN HIGHER EDUCATION CLASSROOMS

Presenter	Fitzgerald, Josh Graduate, Communication
Mentor	Prof. John Hooker
Author	Joshua Fitzgerald

The teacher-student relationship has been an important factor of consideration within the classroom context for some time. It has been suggested that educators do their best in developing the relationships with their students. However, fully conceptualizing this process and what is occurring has lacked clarity. When the rapport is established between teachers and students, then the relationship has reached an adequate level of closeness to allow for students to benefit academically and even socially. The results of this study suggest that students value a socially supportive teacher who is humorous, displays clarity, and is perceived as similar (homophily). In other words, the following variables were found to be significant to students: homophily, social support, humor, and teacher clarity. However, nonverbal immediacy was not found to be a significant indicator of established rapport.

PERCEPTIONS OF A MIDWESTERN FOOD COOPERATIVE: A CASE STUDY

Presenter	Forsythe, Rebecca Graduate, Sociology/Anthropology
Mentor	Prof. Joan Brehm
Author	Rebecca Forsythe

Food deserts create many challenges for access to fresh and affordable foods in communities across the country. Grocery cooperatives present a mechanism to address the challenges of food deserts through seven core co-op principles, including concern for community and member economic participation. Green Top Grocery, a membership-based food cooperative, opened their doors in May 2017, close to a designated food desert in a midwestern community. Green Top Grocery sought, in part, to combat this food desert. However, after two years of operation it remains unclear if the cooperative is meeting that objective and engaging residents of the food desert. This case study seeks to explore the extent to which Green Top Grocery is mediating the challenges of the food desert while also examining how people's social status and milieu affect their perception of the food cooperative by answering the following questions: How do people form their perceptions of food cooperatives in general, and Green Top Grocery specifically? What social factors influence the formation of these perceptions? How might Green Top Grocery's practices influence the formation of these perceptions? A multi-method approach is being used including content analysis, non-participant observation, and semi-structured interviews of cooperative board members, local food access experts, and West Bloomington residents.

THE POTENTIAL ROLE OF IRON AND IRON-ASSOCIATED PROTEINS IN THE NEURAL MECHANISM OF MAGNETIC ORIENTATION IN C. ELEGANS

Presenter	Freebairn, Ploy Graduate, Biological Sciences
Mentor	Prof. Andres Vidal-Gadea
Authors	Ploy Freebairn; Chance Bainbridge; Andres Vidal-Gadea

The ability to detect magnetic fields has been established across taxa and plays an essential role in the ability of many species to orient and navigate long-distance migrations. However, the neural mechanism responsible for this behavior remains unknown. *C. elegans* is a free-living nematode shown by our lab to detect and orient to magnetic fields, and the experimental amenability of *C. elegans* make this an excellent model for studying the transduction mechanisms responsible for magnetic field detection. One leading hypothesis for magnetic transduction involves the coupling of magnetic particles with stretch sensitive receptors. Previous work by others and in our lab found magnetic particles present in *C. elegans*. We used RNA interference to selectively drive down expression in genes encoding proteins known to interact iron. We next evaluated the ability of RNAi-silenced animals to orient to imposed magnetic stimuli. We found a handful of genes whose normal expression appears required for normal magnetic orientation in worms. We are presently constructing fluorescent transcriptional reporter lines to determine the temporal and cellular pattern of expression for these genes. This approach will allow us to determine the potential role of iron and iron-associated proteins in the magnetic field detection and orientation.

VERTICAL FLOW SERS-BASED IMMUNOASSAY USING PLASMONIC AUNP PAPER FOR POINT OF CARE DIAGNOSTICS

Presenter	Frimpong, Richard Graduate, Chemistry
Mentor	Prof. Jeremy Driskell
Authors	Richard Frimpong; Billy Wongi; Jun-Hym Kim; Jeremy Driskell

Surface enhanced Raman Scattering (SERS)-based immunoassays for point-of-care diagnostics is a promising tool to facilitate biomarker detection for early disease diagnosis and control. The technique is based on a sandwiched system in which antigen is first captured by a selective substrate and then labeled by an extrinsic Raman label (ERL). Here, I present on the use of gold nanoparticle (AuNP)-modified filter paper as a novel capture membrane in a vertical flow format. This vertical flow configuration affords reproducible flow of sample and label through the capture substrate to overcome diffusion limited kinetics and significantly reduced assay time. The filter paper was selected due to its affordability and availability, while the embedded AuNPs maximized plasmonic coupling and SERS enhancement. Additionally, the embedded AuNP served as a scaffold to immobilize capture antibody to specifically bind antigen. Here I present on the development of a SERS-based rapid vertical flow (RVF) immunoassay for detection of mouse IgG as a proof of principle. Optimization of assay conditions led to a limit of detection that is comparable to more traditional formats carried out in multi-well plates and significantly reduced assay time to less than 10 minutes. These preliminary results highlight the potential advantages of the SERS RVF platform for point of need diagnostics.

TRANSITIONS IN CRUSTACEAN MOTOR NEURONS EXHIBIT ELEVATED DEGREES OF CHAOS

Presenter	Gonzalez, Josselyn Graduate, Biological Sciences
Mentor	Prof. Wolfgang Stein
Co-Mentor	Prof. Epaminondas Rosa
Authors	Josselyn Gonzalez; Rosangela Follmann; Wolfgang Stein; Epaminondas Rosa

Most of our insights into brain states and their pathologies stem from studies focused on the states themselves and not on the transitions taking place between different states. This is in spite of certain types of transitions being essential to many cognitive and motor functions. Examples of processes that involve state transitions include slow-wave sleep and wakefulness, epileptic seizures, and animal gait speeds. While brain states are mostly well-defined, their transitions often involve irregular, seemingly random activity. Computational models suggest that this irregular activity may be chaotic, and thus deterministic and exponentially sensitive to initial conditions. As a consequence, the activity can very quickly become unpredictable. Many neuronal systems exhibit chaotic activity even in stable brain states, although the degree of chaos is minimized through cellular and circuit mechanisms. We hypothesize that transitions between states exhibit higher degrees of chaos than those of the stable states, and that the chaos increase between the states may contribute to setting the transition.

Our aim is to characterize transition activity in neuronal systems by using a combined computational and biological approach. To determine whether transitions are more chaotic than the states or not, and to understand the role chaos plays in the transition between different states, we observe neuropeptide-induced transitions in an identified neurons of a well-studied crustacean motor system.

In this motor system, modulation by the neuropeptide proctolin initiates rhythmic activity in the lateral pyloric (LP) neuron by activating a depolarizing ionic current called IMI. Our computational approach using a single neuron model indicates that adding IMI increases firing frequency and elicits transitions from rhythmic bursting to tonic. It also predicts that transitions caused by IMI show high levels of chaos. To test these predictions in the biological system, we blocked extrinsic modulatory input and also synaptically isolated LP to remove network influences. We find that proctolin application increased LP's firing rates and elicited transitions, albeit from arrhythmic tonic to robust, rhythmic bursting. Quantification of how quickly the system becomes unpredictable using the Lyapunov exponents as an indicator of chaos suggests that the levels of chaos are larger during the transition than before and after. This supports our hypothesis. We are currently exploring other numerical analysis techniques to further verify these results. We are also studying the reasons why transitions in the biological neuron occurred in the opposite direction than in the model.

ACCURACY OF GPS TRACKING IN FITNESS WATCHES

Presenter	Gridley, Tessa Undergraduate, Kinesiology & Recreation
Mentor	Prof. David Thomas
Co-Mentor	Prof. Adam Jagodinsky
Authors	Tessa Gridley; David Q. Thomas; Adam Jogodinsky

Fitness activity trackers/watches are very popular because buyers are interested in tracking exercise energy expenditure. One advertised claim of some devices is that GPS tracking provides accurate measures of distance traveled. PURPOSE: To determine if six of the top rated and most popular physical activity trackers/smart watches according to PC Magazine 2018, have accurate measures of GPS recorded distances. METHODS: An Apple Watch, Fitbit Iconic, Fitbit Versa, Garmin Vivosport, Garmin Vivoactive 3, and a Garmin Forerunner 35 were all tested on an outdoor walking trail and along a zig-zag pattern obstacle course. Twenty trials were performed on each course by the same walker/researcher and each course was a 659 foot (200 meter) walk. Two watches were worn at the same time on the left arm while a TR industrial 88016 FX Series Collapsible Measuring Wheel was used to record the distance as well with the right arm. Each watch was set to the appropriate setting such as walking or running, and GPS signal was turned on and connected. The distance measured by the wheel and each watch was recorded along with the time taken to complete each trial. Means, standard deviations, and relative error were calculated for the GPS distance of each watch and the time taken to cover the distance. RESULTS: There was a great deal of variation in the results. For the Outdoor Walking Trail condition, the results showed that the monitors gave responses ranging from 590 feet to 670 feet. The Fitbit Iconic was the least accurate with an average relative error of 10.4% and the Apple Watch was the most accurate (relative error 4.2%). When looking at the obstacle course condition, the range was from 306 feet to 670 feet. The Apple Watch and Fitbit Versa were most accurate, only 10.1 feet off (4.0% relative error). The Garmin Vivosport, Garmin Forerunner 35 and Fitbit Iconic showed the most relative error 8.36%, 5.9%, and 5.55% respectively. CONCLUSIONS: Caution must be used when relying on physical activity monitors if accuracy is desired in measuring distance via GPS.

SELF-CARE IN THE PRIMARY CARE SETTING

Presenter	Halder, Liana Graduate, Social Work
Mentor	Prof. Chris Gjesfjeld
Author	Liana Halder; Chris Gjesfjeld

Primary care providers are more likely to experience high levels of stress that can lead to burnout within the medical field. This study will examine self-care practices for healthcare professionals within the primary care setting. Physicians, nurse practitioners, and registered nurses from several multispecialty OSF clinics will be invited to participate in an anonymous survey exploring current self-care practices. The purpose of this study is to understand how self-care practices can act as protective factors against burnout or compassion fatigue.

CONSTRUCTIVISM AND PIAGET'S STAGES OF COGNITIVE DEVELOPMENT: EFFECTIVE OR NOT

Presenter

Halperin, Kaytlin

Undergraduate, Teaching and Learning

Mentor

Prof. Miranda Lin

In the study, I will present an analysis of the movie "Brave" (2012) using Piaget's constructivism and stages of cognitive development (Follari, 2019). This theory touches on the role of a child's environment in the education process. Each stage describes how a child uses his/her intuition and prior knowledge to advance his/her understanding of the world around him/her. Moreover, Constructivism is the teaching style that enhances this learning process, allowing the students to formulate their own strategies and concepts, using their contact with their environment, through minimal direct instruction from the educator.

I have used this theory to analyze the movie because the main character, Merida, learns through her personal experience, working with her environment and reflecting on her actions to reach an understanding of the spell cast on her mother and come up with the antidote. In the movie, there are a few facilitators to this learning, just as teachers would facilitate learning in the constructivist classroom. However, for the most part, Merida uses her own previous knowledge of her country and the legends told to her as a child, as well as her own intuition to solve the witch's riddle. Additionally, one witnesses Merida working through the stages of development, proposed by Piaget, throughout the movie. She works with her senses at first obtaining a very simple understanding of her situation, then she starts to use concrete objects, in trying to reverse the spell. Finally, she accumulates all of the knowledge she built throughout the movie to end up with a very post-operational thought process in her final attempt to save her mother, a form of self-reflection and abstract comprehension of the witches' spell and riddle.

A brief description of Merida's experience in each stage of cognitive development accompanied by a summary of the movie will be addressed. Further, examples of how teachers may use this education style and theory in the classroom, along with a testament to its success rate among students will be provided.

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THE EFFECTS OF WEIGHTED BASEBALL PITCHING ON UPPER ARM EMG IN YOUTH THROWERS

Presenter	Hammond, Eric Graduate, Kinesiology & Recreation
Mentor	Prof. Michael Torry
Authors	Eric Hammond; Michael Torry; Adam Jagodinsky; Sean Higinbotham

Introduction: The overhead baseball throw has been related to elbow and shoulder injuries. To combat these injuries, the use of weighted baseballs to strengthen the musculature about the elbow and shoulder during the throw are being employed particularly in youth throwers. The use of weighted baseballs on shoulder and elbow mechanics, however, is not well documented and the electromyographic (EMG) profiles of upper arm musculature are not well understood. Purpose: To compare EMG profiles at the elbow and shoulder musculature during the cocking and acceleration phases of the pitch with increased (5, 7, 9, 11 oz) weighted baseball throwing. Hypothesis: As pitchers throw heavier baseballs, the shoulder musculature will increase in EMG magnitude. Methods: Youth baseball players (N=10) with mean height: 1.45 +/- .07 m, weight: 42.18 +/- 9.36 kg, age: 9.67 +/- 1.25 yrs. participated in this study. Full body, 3-marker/segment pitching motions were captured by 12 high speed (200 Hz) infrared cameras synced to two force plates (1000Hz). EMG data were recorded (1000 Hz) with surface electrodes and post-processed employing Root Mean Square with a 25 MS window and referenced as a percent of Maximal Voluntary Contraction (%MVC). Results: During the cocking phase, Repeated Measures ANOVA yielded differences in teres EMG ($p = .01$) with post hoc showing 5 oz with less EMG compared to 9 oz ($p = .008$); but more EMG in the 7 oz and 9 oz conditions compared to 11 oz (all $p \leq .007$). No differences were noted in any other muscles for cocking phase (all $p \geq .21$). No differences were found in the acceleration phase for any muscle (all $p \geq .11$). Conclusion: Shoulder muscles involved in overhead throws showed trends to decrease in muscle activation particularly during both phases when a heavier ball is used. However, only the teres changed significantly. Qualitatively, it was observed that weighted pitches create changes in the throwing kinematic profile that do not reflect the standard overhead throw.

HEMODYNAMIC EFFECTS OF GRASTON TECHNIQUE ON TRIGGER POINTS IN THE UPPER TRAPEZIUS IN PATIENTS WITH NECK PAIN

Presenter	Harris, Hannah Graduate, Kinesiology & Recreation
Mentor	Prof. Noelle Selkow
Co-Mentor	Prof. Justin Stanek
Authors	Hannah Harris; Noelle Selkow; Justin Stanek

Context: Non-specific neck pain is defined as those experiencing neck pain without a specific diagnosis with varying causes such as posture, occupational stressors, and muscular trigger points. Individuals often present with poor posture, including forward head and rounded shoulders. In this position, the upper trapezius muscle becomes tight due to sustained muscle activity leading to trigger points as a result of decreased oxygen to the muscle. Graston Technique (GT) is a form of manual therapy that uses stainless steel instruments to break down tissue adhesions. GT on trigger points has been presumed to increase local blood flow leading to tissue healing and decreased pain, however, the physiological effects on muscle hemodynamics have yet to be proven.

Objective: To measure active cervical range of motion, neck pain, and subcutaneous hemodynamics of the upper trapezius following a single intervention of GT in patients with neck pain stemming from trigger points.

Study Design: Single-blinded randomized controlled laboratory study.

Participants: Sixty participants between the ages of 18-50 years old with non-specific neck pain and trigger points present in the upper trapezius muscle. Participants were excluded if they had manual therapy treatment within the past 3 months to the neck or shoulder area, history of a diagnosed neck injury, history of spinal or shoulder surgery, cancer, kidney dysfunction, pregnancy, taking an anticoagulant medication, varicose veins, polyneuropathies, diabetes, heart failure, contagious skin conditions, open wounds, thrombophlebitis, and hypertension.

Intervention(s): Graston Technique, sham instrument assisted soft tissue mobilization, or control. All participants completed the Graston protocol which included: a 10-minute arm bike warm, 5-minute treatment based on group allocation, passive lateral flexion stretch, and 3 therapeutic exercises. Treatment area was determined by bilateral palpation of the upper trapezius muscle for the most prominent trigger point.

Main Outcome Measure(s): Subcutaneous hemodynamics, pain pressure threshold, and neck lateral flexion range of motion.

Hypotheses: GT will cause immediate improvements on cervical range of motion, neck pain, and increase blood flow to the upper trapezius muscle more than a sham treatment. The findings of this research study will provide clinicians with a valid and reliable treatment technique for those suffering with non-specific neck pain.

WHAT'S ON YOUR MIND? APPLYING A NEUROCOGNITIVE MODEL OF EMOTION REGULATION TO ATTACHMENT

Presenter	Hart, Marjorie Kate Graduate, Psychology
Mentor	Prof. Suejung Han
Co-Mentor	Prof. J. Scott Jordan
Author	Marjorie Kate Hart

Attachment theory has often been studied as a trait-like variable which has reliably predicted outcomes in numerous domains. The underlying mechanism to attachment is its role in affect regulation, and theories about the systems involved outline two separate processes depending on attachment security: primary attachment strategies and secondary attachment strategies. This paper focuses on the secondary attachment strategies, outlining the behavioral and neurocognitive evidence in support of Mikulincer, Pereg, and Shaver's (2003) models of hyperactivation and deactivation affect regulation systems. Attachment anxiety's hyperactivation system is well-supported in both behavioral and neural domains, but the attachment avoidance deactivation system is only consistently supported in behavioral domains. As an important step forward in understanding the affect regulation system in humans, this paper attempts to fit the models of attachment affect regulation into an emotion regulation model proposed by Etkin, Büchel, & Gross (2015). It is concluded that because attachment systems are already understood as internal working models, and because Etkin, Büchel, & Gross' (2015) model delineates a system that relies on internal working models, attachment and general emotion regulation research can be successfully integrated. Additionally, studies across the domains of attachment and emotion regulation show relatively consistent neural patterns of affect regulation, with the secondary attachment strategies coinciding with worry and suppression strategies outlined in general emotion regulation research. However, more research connecting the attachment affect regulation and emotion regulation subfields is necessary to understand the cognitive systems behind emotion regulation.

YOUNG FARMER ADVICE 101

Presenter	Hartman, Blake Undergraduate, Agriculture
Mentor	Prof. Maria Boerngen
Author	Blake Hartman

The majority of farmland in Illinois is operated by farmers who rent the land from landowners. Landowners are often represented by accredited farm managers in the process of selecting farm operators and determining the terms of farmland leases. Through this process, landowners and farm operators establish a business relationship, and a farmer who wishes to rent must indicate to the landowner and/or farm manager that he or she is a good candidate to farm the owner's land. Farmers who are more established and experienced have connections with landowners and farm managers, in addition to proven production and financial records, and may therefore be more likely to be chosen as an operator. Therefore, it is often a struggle for young farmers today to rent farmland for the first time due to their relatively limited resources and experience. The objective of this case study was to identify steps a young farmer can take to best prepare to be chosen to rent farmland by a landowner. Through telephone interviews in Fall 2019, ten accredited farm managers from throughout the state of Illinois provided valuable information that young farmers can utilize they seek to advance their farming careers. Interview participants were members of the Illinois Society of Professional Farm Managers and Rural Appraisers (ISPFMRA), representing a wide range of experience levels (from nine to fifty-nine years). Questions addressed the farm managers' background and experience, and specific steps young farmers can take to best represent themselves to landowners. Results of this study indicate that young farmers should establish good reputations and strong connections in their communities, and document the capital they have available to their operations. They should also stay informed about trends in the industry, be prepared to offer a fair cash rent, and avoid what accredited farm managers refer to as "rent chasing." The results of this study can inform the efforts of young farmers as they seek to build and grow their farming careers.

COMPARING VERBAL AND SPATIAL WORKING MEMORY IN MONOLINGUAL AND BILINGUAL SPEAKERS

Presenter	Hernandez, Rosaury Graduate, Psychology
Mentor	Prof. Alycia Hund
Author	Rosaury Hernandez; Darin Roberts

A large number of studies have investigated the role of bilingualism on performance of mental flexibility and inhibition tasks (Bialystok et al., 2009). Typically, bilingual participants outperform monolingual participants on mental flexibility and inhibition tasks, an effect called the bilingual advantage (Bialystok et al., 2005; Costa, Hernández, & Sebastián-Gallés, 2008). This effect has been explained by lifelong experience in inhibiting, deploying, and switching between two or more languages. (Bialystok, 2009; Martin-Rhee & Bialystok, 2008). These same cognitive skills are perhaps critical for performing well on working memory tasks (Luo, Craik, Moreno & Bialystok, 2013). However, studies examining bilingualism and working memory often find mix results depending on the employed modality. Luo et al. (2013) used a spatial span task to measure visual working memory and a span task to measure verbal working memory. They found that monolingual participants outperformed bilingual participants on the verbal span task, whereas bilingual participants outperformed monolingual participants on the spatial span task. However, Wodniecka et al. (2010) used the same tasks but did not find a bilingual advantage using the same spatial span task. To further investigate the relation between bilingualism and working memory modality, the present study aimed to examine verbal and spatial working memory among monolingual and bilingual adults. Participants will complete the digit-span task (verbal working memory), Corsi span task (visuospatial working memory), and a language questionnaire (LEAP-Q; Marian et al. 2007). We predict that bilingual participants will outperform monolingual participants in both tasks, indicating that the bilingual advantage is evident in verbal and spatial working memory.

EFFECTS OF AN FMS CORRECTIVE EXERCISE PROGRAM ON INJURY RATES IN DIVISION III BASKETBALL ATHLETES

Presenter	Hewson, Rachael Graduate, Kinesiology & Recreation
Mentor	Prof. Nicole Hoffman

The Functional Movement Screen (FMS) was developed to help clinicians and other health care providers screen for dysfunctional movement patterns in their patients/athletes. FMS requires elements of mobility and stability for proper completion of the test exercises. These test exercises place the individual in positions where imbalances or dysfunction become identifiable. Presently, research regarding FMS is focused around using the FMS system as an injury risk assessment tool. However, the purpose of the FMS system is not just to identify increased injury risk, it is also meant to aid in the development of a corrective exercise program to reduce injury risk. Purpose: To examine the effects of an individualized FMS exercise program on injury rates within Division III men's and women's basketball players. Methods: Thirty NCAA Division III male and female basketball players were administered the FMS protocol at the beginning of the basketball season and were scored on their baseline performance. Scores from each participant were input into the FMS Pro360 software in order to generate an individualized corrective exercise program for each participant. Participants performed the corrective exercises two days a week over the course of one month during the basketball season. Injury data were collected from the season that the FMS was administered and the season prior to examine injury rates. At the completion of the season, the participants were screened again with the same FMS protocol. We aim to examine the effect of the corrective exercise program on injury rates, as well as performance in the FMS at the conclusion of the exercise program. Results: To be determined; data are currently being collected. Implications: With this research, we hope to show the efficacy of the FMS's ability to identify those with increased injury risk and the exercise program's ability to correct dysfunction and reduce injury risk.

CONNECTEDNESS AND KNOWLEDGE OF THE UNIVERSITY AMONG FIRST-TIME FRESHMAN AND TRANSFER STUDENTS

Presenter	Hilsabeck, Hallie Graduate, Social Work
Mentor	Prof. Chris Gjesfjeld
Authors	Hallie Hilsabeck; Chris Gjesfjeld

The purpose of this research was to compare how connected and knowledgeable first-year freshman are contrast to transfer students in regard to Illinois State University resources. Participants of the study consist of students who are 18 years or older, currently living in University owned housing, and are either a first-year freshman or a student who has transferred to Illinois State University. An online self-developed survey containing mixed-methods of quantitative and qualitative questions was emailed to all potential participants. Level of involvement, knowledge of resources on campus, and level of connectedness to the university were measured by quantitative questions. Qualitative questions were implemented to query how students propose the University improve. The results for this research are in progress and cannot be provided at this time. We hypothesize that first-year freshman are more knowledgeable and connected to Illinois State University resources than transfer students.

THE PERCEPTIONS OF MEDIA PORTRAYALS OF AGRICULTURE

Presenter	Hoerbert, Bailey
	Undergraduate, Agriculture
Mentor	Prof. Maria Boerngen
Author	Bailey Hoerbert

"With less than 2 % of the population being directly involved in agriculture production, the general public has lost touch with where their food comes from and have a lack of trust towards agriculture producers. Studies have shown that Americans tend to fear food production and production agriculture. This fear stems from not understanding what farmers are doing and why they are doing it. A recent report found that younger adults have more trust in technological sources such as bloggers, fitness apps, and TV personalities than information from farmers and scientists. While information is becoming more available at faster rates than in years past, not all media information is accurate. It has been reported that fake news stories increased exponentially in the months leading up to the 2016 presidential election. While "fake news" is a term typically used when discussing politics, it also has negatively affected the agriculture industry. False media portrayals about the agriculture industry can easily push consumers to have doubts about the overall production of food. To address the disconnect between farmers and the non-farming public, we paired agriculture students (who grew up on farms) and non-agriculture students (who did not grow up on farms) together to discuss their varying perspectives on the agriculture industry, one-on-one. These paired student experiences took place in Fall 2018, Spring 2019, and Fall 2019 semesters (n=32). We sought to measure any changes in the participants' perspectives as a result of this experience. The media portrayal of agriculture was one of the issues we studied. Through questionnaires administered prior to this experience, we determined that the agriculture students perceived a more negative media bias toward the industry than the non-agriculture students ($p < 0.001$). Follow-up questionnaires evaluated how these perceptions and beliefs changed as a result of this experience. On a scale ranging from 1 ("...more biased than before") to 3 ("... more positive than before"), both groups of students indicated little to no opinion change (1.59 and 1.57 for the agriculture and non-agriculture students, respectively). However, when asked in the pre-questionnaire about "What challenges do farmers face," there was an increase in the concern from agriculture students about negative media portrayals from the 2018-2019 school year (1 out of 11, or 9%) to the 2019 fall semester (4 out of 7, or 57%). Data collection is ongoing."

EXAMINING TRANSFER EFFICIENCY OF PAPER SUBSTRATES UTILIZED AS PHYSICAL TRANSFER SWABS

Presenter	Holtz, Jessica Undergraduate, Chemistry
Mentor	Prof. Christopher Mulligan
Authors	Jessica Holtz; Trevor McDaniel; Alex Swiontek; Christopher Mulligan

Trace chemical residues while proven difficult to collect, can provide investigatory information during crime scene investigations. Physical transfer swabbing is commonly employed, followed by sample introduction methods (thermal desorption, etc.) or by direct analysis of said swab with ambient MS methods (DESI, PSI, etc.). Post-use transfer swabs have been shown highly amenable to paper spray ionization - mass spectrometry (PSI-MS), where said swab is employed for collection and as the disposable ionization source. To this end, paper materials dictate both transfer and ionization capabilities of this type of method, making characterization studies informative. In this work, transfer efficiencies of varying swabbing materials are assessed when utilized to collect trace drugs from surface of forensic interest.

Various paper substrates were purchased from chemical supply vendors (Sigma, Fisher, etc.). To determine transfer efficiency, known masses of chemical residues were deposited onto surfaces of interest by spotting and drying exact volumes of serially-diluted drug standards (Cerilliant). Paper candidates were wetted with an extraction solvent, utilized to swab drug residues, and then allowed to dry. Used swabs were reconstituted in 1.0 mL of methanol in autosampler vials and analyzed via LC-MS (Thermo Scientific Q Exactive HRMS coupled with an UltiMate 3000 LC system). Comparison to generated calibration curves using similar drug standards allowed determination of effective concentration and back calculation of transfer efficiency, or the percentage of drug present that is transferred via swabbing.

THE EFFECT OF NUTRITION EDUCATION ON NUTRITION KNOWLEDGE AND BODY COMPOSITION

Presenter	Hopkins, Emma Graduate, Kinesiology & Recreation
Mentor	Prof. Nicole Hoffman
Author	Emma Hopkins; Nicole Hoffman

Nutrition is a key component of athletic performance, yet it is commonly overlooked, as only 10% of collegiate athletic departments employ a registered dietitian (RD). Without proper resources, a combination of inaccessible RDs and a lack of basic nutritional knowledge can negatively affect performance, health, and body composition in the collegiate athlete. Studies on the effects of nutritional knowledge on body composition in collegiate athletes are limited. The purpose of this study is to evaluate the baseline level of nutrition knowledge amongst Division I athletes, and then determine if their level of nutrition knowledge affects their body composition after a 4-week intervention period. Sixty Divisions I athletes were recruited to participate in this randomized control trial. All participants completed a nutrition knowledge questionnaire addressing weight management and

eating disorders, micronutrients and macronutrients, supplements and performance and hydration, as well as a body composition assessment (measured using the BOD POD) at baseline. The intervention group (n=30) received nutrition education materials on the same topics evaluated in the questionnaire, weekly throughout the 4-week intervention period. The control group (n=30) continued with their regular activities for the duration of the 4-week intervention period. After 4 weeks, all participants repeated the same nutrition knowledge questionnaire and BOD POD assessment as baseline to determine if change in nutrition knowledge and body composition occurred over the 4-week intervention period. Data are currently being collected and we hypothesize that the intervention group will have increased nutrition knowledge and positive improvements in their body composition after a 4-week intervention.

IDENTIFICATION OF MOLECULAR TARGETS IN A *C. ELEGANS* SUPPRESSOR OF DUCHENNE MUSCULAR DYSTROPHY

Presenter	Hughes, Kiley Graduate, Biological Sciences
Mentor	Prof. Andres Vidal-Gadea
Authors	Kaitlyn Termine; Evan Gustafson; Andres Vidal-Gadea

Duchenne muscular dystrophy (DMD) is a genetic disorder caused by loss of the protein dystrophin, which is responsible for connecting actin fibers to the sarcolemma and transferring force laterally into the extracellular matrix. In humans, DMD presents at a young age and results in developmental delays, muscle necrosis, increased sarcoplasmic calcium, loss of ambulation, and early death. Current animal models have been challenged by their inability to model the early onset and severity of the disease without the addition of sensitizing mutations. Recently, we showed how dystrophic (*dys-1*) *C. elegans* that are challenged by burrowing through agar recapitulate many salient phenotypes of DMD. This includes loss of mobility, muscle necrosis, and sarcoplasmic calcium dysregulation. Here, using a forward genetic screen for the animals burrowing ability, we have generated and isolated two suppressor mutants of Duchenne muscular dystrophy. While these animals have improved burrowing ability, metrics of the crawling animals show varying results. The suppressor mutants show greater angular velocity and speed than both the dystrophic and wild type strains. In addition, we found that analyzing the sequenced genome of these animals was not sufficient for finding the mutation responsible for rescuing the dystrophic animal, and report our improved strategy here. By identifying the mutations responsible for improved locomotor ability and muscle integrity in our suppressor mutants, we may identify genes and pathways more susceptible to intervention that can be used to establish therapeutics for DMD, slowing degeneration and improving the lives of Duchenne muscular dystrophy patients.

SOCIAL MEDIA RUMINATION: THE IMPACT OF LIFE GOAL ORIENTATION

Presenter	Hynes, Keeley Graduate, Psychology
Mentor	Prof. Daniel Lannin
Co-Mentor	Prof. Luke Russell
Authors	Keeley Hynes; Leandra Parris; Daniel Lannin; Luke Russell; Jeremy Kanter; Ani Yazedjian

Previous research demonstrates that ruminating on social media content is associated with greater mental distress. However, it is unclear what factors are associated with rumination. Using Self-Determination Theory, this study examined how orientation toward intrinsic and extrinsic life-goals differentially predicted social media rumination in a sample of racially and socioeconomically diverse high school students at two time points.

STRATEGIES FOR AT-RISK YOUTH ACHIEVING AND AVOIDING DISTAL GOALS

Presenter	Hynes, Keeley Graduate, Psychology
Mentor	Prof. Luke Russell
Co-Mentor	Prof. Daniel Lannin
Authors	Keeley Hynes; Luke Russell; Leandra Parris; Daniel Lannin; Jeremy Kanter; Ani Yazedjian

Background

Long-term planning may be beneficial for vulnerable youth, as goal-setting in therapy has been shown to be effective in helping prevent psychological distress and improve retention in therapy (Cairns., Kavanagh, Dark, & McPhail, 2019). In adolescence, the prefrontal cortex is not fully developed, and adolescents' decision-making capabilities are more susceptible to stress than adults (Tottenham, & Galván, 2016). This finding may be particularly important for low-income youth who may experience more stressful life events than adolescents from higher-income homes (Reynolds, O'Koon, Papademetriou, Szczygiel, & Grant, 2001). Therefore, in an effort to better inform intervention services and supports, the current study sought to evaluate the long-term goals of at-risk youth and the current strategies they are engaging in to achieve those goals.

Methods

Data were collected from 187 high school students from predominantly low-income households in Champaign County participating in a school-based relationship education and job readiness training program. Students reported their goals for the next year and the current strategies they were utilizing to achieve them by completing the "possible selves task". Goals were categorized using codes developed by the original authors of the "possible selves task" (Oyserman, 2004). Subsequently, following guidelines from Corbin and Strauss (2015), an inductive constant comparative method was used to categorize adolescents' strategies.

Preliminary Results

Goals were categorized as relating to achievement, personality traits, health, and lifestyle. Strategies to reach these goals were categorized as relating to self-improvement, work and finance, school, staying out of trouble, and relationships. Goals and strategies reported by students demonstrated the diversity of experiences at-risk youth have in their schools, families, and neighborhoods. For example, many students reported goals related to improving their school performance through studying more, increasing school attendance, and completing their homework. Other students, however, reported goals and strategies strongly influenced by other stressors in their environments such as avoiding violence, gang membership, or jail time which they hoped to achieve by cutting off toxic relationships and avoiding the police.

Conclusion

Understanding how youth plan for their future and hope to achieve their goals can assist mental health and school professionals in targeting interventions to best support them. Some adolescents' goals and strategies to achieve them may be unrealistic or maladaptive, suggesting a need for additional services or intervention.

CAN SUBJECTIVE TIME COST EXPLAIN COGNITIVE TASK CHOICES?

Presenter	Isaacs, Raina
	Graduate, Psychology
Mentor	Prof. Dawn McBride
Author	Raina Isaacs

Previous research (Potts et al., 2018; Rosenbaum & Bui, 2019) suggests that participants' time estimates for completing the tasks is the primary predictive factor of task choice. However, these past studies have only compared a perceptual-motor task with a cognitive task. The current study compares cognitive to cognitive tasks. The purpose of the current study is to investigate the factors that contribute to task choices for cognitive factors. Participants will be given instructions on the three tasks (box-moving, item generation, and addition/subtraction problems). After receiving the instructions, participants will then make an estimate of how long each task will take them. They will then be given a series of trials where they choose between two of the three tasks. Difficulty levels of the tasks will vary across trials. Participants will complete whichever task they choose within each pair of tasks presented. Based on results from past studies, we predict that participants' subjective time estimates will predict which cognitive task they will choose to complete in each pair of tasks given.

HOPEFULNESS: EXPLAINING THE LINK BETWEEN SELF-AFFIRMATION AND SELF-ESTEEM

Presenter	Ivanoff, Stephanie Undergraduate, Psychology
Mentor	Prof. Daniel Lannin
Co-Mentor	Prof. Jeremy Kanter
Authors	Taylor Ullrich; Stephanie Ivanoff; Daniel Lannin; Jeremy Kanter; Luke Russel; Ani Yazedjian

Problem or Major Purpose: The present study examines the association among self-affirmation, hope, and self-esteem. Self-affirmation is a process that involves compensating for threatened domains of one's self-worth (e.g., feeling unintelligent after failing a test) by being reminded of positive aspects of one's identity that are not threatened (e.g., feeling positive about being a loving sister); the tendency to self-affirm has been linked to decreased perceptions of threat, and thus may increase faith in one's ability to achieve positive outcomes (i.e., hope) and ultimately bolster self-esteem (Sherman & Cohen, 2006; Tesser, 2000). Given that hope has been linked to accomplishing goals (Snyder, 1995) and self-esteem (Frieson & Frieson, 1997), it is possible that hope may be a critical determinant of self-esteem maintenance. The present study examined whether the link between self-affirmation and self-esteem was due to associations with greater hope. Specifically, we predicted a mediation effect wherein self-affirmation would predict greater hope, which in turn would predict greater self-esteem.

DOES OUR RELATIONSHIP WITH NATURE INFLUENCE OUR ARGUMENTATION SKILLS ABOUT CONSERVATION?

Presenter	Jayasinghe, Iresha Graduate, Biological Sciences
Mentor	Prof. Rebekka Darner
Authors	Iresha Jayasinghe; Rebekka Darner

Examining the human-nature relationship and individual reasoning about biodiversity conservation is important to understanding human treatment towards nature because this provides direction to mitigate human induced environmental issues. This study determines whether individuals' relationships with nature (NR) and emotions experienced during evidence evaluation drive evaluation of evidence and claims about biodiversity conservation. It is hypothesized that participants exhibit motivated reasoning during argument evaluation, in which their NR and emotions experienced during argument evaluation will influence their evaluation of the evidence-based argument. The predictions are: 1. Participants with a strong NR exhibit higher quality argument-evaluation skill as they evaluate an anti-conservation argument, compared with their pro-conservation argument evaluation. 2. Participants who experience positive emotions during evidence evaluation will demonstrate higher quality argument-evaluation skills, compared to participants who experience negative emotions during evidence evaluation. The participants were approximately 250 undergraduate students from a large, Midwestern institution recruited via the university mass email listserv that included a link to the Qualtrics questionnaire. Relationship to nature was measured using the short version of the NR scale. Scientific argumentation was assessed by the Uncertainty-Infused Scientific Argumentation Test (USAT) modified to focus on biodiversity conservation argumentation. The relationship between argument-evaluation skills and the NR was detected using a two-way analysis of variance. The relationship between argument-evaluation skills and emotions was detected utilizing an analysis of covariance. This research is the first to connect NR, the role of emotion during evidence evaluation, and argument evaluation skills, giving insight into how biodiversity conservation can be taught to support evidence-based reasoning and how scientific argumentation skills can be improved by engaging students in argumentation tasks related to nature.

ELEMENTARY GENERAL AND SPECIAL EDUCATORS' EFFICACY TEACHING STUDENTS WITH DISABILITIES

Presenter	Johnson, Morgan Graduate, Psychology
Mentor	Prof. Alycia Hund
Co-Mentor	Prof. Adena Meyers
Authors	Morgan Johnson; Alycia Hund; Adena Meyers

The Individuals with Disabilities Education Act (2004) is a U.S. federal law that promotes an inclusive model of classroom participation. In this model, the goal is that all children, regardless of disability status, learn together while receiving high quality instruction and developing positive social relationships with peers. With the rise of inclusive education, more and more students with disabilities are receiving instruction in the general education classroom. Thus, it is pertinent that general educators feel confident in their abilities to effectively teach students with disabilities. Unfortunately, research has demonstrated that general education teachers have a low sense of teacher efficacy for teaching students with disabilities, in part due to a lack of education, experience, and support. Acknowledging the importance of teacher efficacy and the role it plays in children's academic success, the proposed study presents an attempt to analyze elementary teacher efficacy in multiple domains. First, this study will examine general educators' efficacy in teaching students with disabilities in comparison to special educators, who specialize in the teaching of diverse learners. In addition, this study will examine whether general educators' efficacy differs for teaching students with disabilities in comparison to students in general. Lastly, this study will attempt to better understand the construct of teacher efficacy and offer valuable information regarding related details such as education, experience, and support.

A VISUAL STUDY OF MISINFORMATION AS A THREAT TO HUMAN SECURITY

Presenter

Jukes, Aaron

Undergraduate, Politics and Government

Mentor

Prof. Michaelene Cox

How might misinformation constitute a threat to human security, especially political security? What do the effects look like? In this study, I will be analyzing misinformation from news media as we have seen in the last several years and how it contributes to threats to the political dimension of human security. This study will primarily look at misinformation in the United States in national politics. Some examples of misinformation include the so-called "Birther Movement," "fake news," conspiracy theories surrounding events like 9/11 and mass shootings, and claims of sexism and anti-Semitism during the 2020 primary elections in the US. This study will analyze published photos from databases like Getty Images and news sites like CNN, Fox News, and MSNBC. These images will depict examples of misinformation, which may include false or downplayed information, and the effect on voter turnout.

CAN THREAT ONLY MAKE PEOPLE CONSERVATIVE? THE EFFECT OF THREAT SALIENCE ON THE DEFENSIVE REACTIONS OF LIBERALS AND CONSERVATIVES AND ITS LONG-TERM CONTINUITY

Presenter	Jung, Han
	Graduate, Psychology
Mentor	Prof. Eros DeSouza
Co-Mentor	Prof. Suejung Han

The development of the theories of threat and defense has revealed that conservative prejudice is a type of defensive reactions in which people attempt to protect egos and status quo from social threats, which stem from the interactive mechanism between the various situational backgrounds related to threat and the dispositional factors that make individuals more sensitive to threat. However, some studies have shown that dispositional liberals or people with dispositional traits known to be relatively insensitive to threats are rather more likely to be affected by threat priming; Therefore, I will propose the successive three studies to further analyze the theoretical points of this study. Study 1 will check whether the same result can be replicated when the threat stimuli are matched with a goal as the ingroup favoritism, and Study 2 will attempt to induce a different aspect of the defensive reaction to the threat stimuli. Finally, Study 3 will test whether these priming effects can be significant even in the long term and will allow participants to respond identically to equivalent stimuli over time.

EFFECTS OF VIDEO TECHNOLOGY ON COOKING SELF-EFFICACY

Presenter

Kaesberg, Zak

Graduate, Family and Consumer Sciences

Mentor

Prof. Julie Schumacher

College students, on average, have poor nutritional habits associated with increasing risk of obesity and chronic disease later in life. Today's average student has low self-efficacy for cooking meals in the home and thus, is highly dependent on convenience-type food items. A valuable technique for improving cooking skill in individuals is through the use of video technology to teach cooking. Undergraduate students are likely Millennials and prefer to use technology for learning purposes. The objective of this study was to test the effect of video technology on cooking self-efficacy in undergraduate college students living off-campus at a public Midwestern University. Two groups of undergraduate college students (n=71) were assessed for baseline self-efficacy for cooking skill and number of meals cooked per week using an online survey. One group received five weeks of recipe cards and surveys assessing self-efficacy for cooking the meal and barriers to cooking in the home. The second group received five weeks of a recipe card and accompanying cooking video in addition to a survey assessing the same parameters. Participants were also surveyed at the end of the study to assess changes in cooking self-efficacy, number of meals cooked per week, and differences between groups. There were statistically significant improvements from pretest to posttest cooking self-efficacy scores for participants but no statistically significant differences between pretest and posttest number of meals cooked per week ($p>.05$). There were no statistical differences between intervention groups ($p>.05$). Conclusions of the study found students reported confidence in cooking skill, but lacked time and equipment associated with cooking healthy meals. Overall, the use of video technology was effective at improving self-efficacy for cooking if: 1) Meals are simple, short, and specific. 2) Recipe videos are short to maintain viewer attention.

THE PRINCIPLE OF THE IDENTITY OF INDISCERNIBLES

Presenter

Kalafut, Megan

Undergraduate, Philosophy

Mentor

Prof. David Sanson

The Identity of Indiscernibles is the principle that states, roughly, that if two things have all properties in common, then they are the same thing. It is an attractive principle because it gives us a criterion for identity and as such a criterion for counting. But, in "The Identity of Indiscernibles," Max Black argues the principle is false because there could be two distinct but indiscernible spheres. In this poster, I will argue that there is only one object in the two spheres case he describes, and that if there are multiple objects, it is possible to discern them from each other.

WHAT ARE THE NEEDS AND PREFERENCES OF CANCER PATIENTS AND THEIR LOVED ONES IN REGARD TO SUPPORT SERVICES, PROGRAMS, AND GROUPS?

Presenter	Kaspar, Jessica Graduate, Social Work
Mentor	Prof. Chris Gjesfjeld
Authors	Jessica Kaspar; Chris Gjesfjeld

While there is a large body of research geared toward evaluating the psychosocial supports needed by cancer patients, as well as the medical needs of those patients, there is a much smaller amount of research and needs assessments conducted to determine the types of support programs desired by these patients. Things like financial and insurance needs, transportation concerns, individual and family counseling, and so on have been evaluated in many needs assessments thus far. The current study will conduct an assessment to discover the needs and preferences of oncology patients and their loved ones in regards to supportive programs, services, and groups. The study also aims to determine the usage of currently offered programs, services, and groups, whether there are any barriers to utilizing these programs, and if underserved groups (e.g. people of color, men, those of lower socioeconomic status) experience any unique barriers or have any specific needs. This type of research is critical because the current body of research shows that unmet needs are often associated with a poorer quality of life, while giving attention to psychosocial needs has been linked with higher patient satisfaction in overall medical care. In fact, the research has shown that the provision of less desired services that do not match actual patient needs may indeed have harmful effects to patients. Therefore, the information gathered from this needs assessment will be used to implement supportive programming and services based on what patient's actual needs and preferences are.

A 10-item needs assessment in the form of a survey will be distributed to patients and their loved ones both in person at the cancer center and via an online Qualtrics survey link posted to the Community Cancer Center website and Facebook page. An email blast will be utilized to recruit patients to the survey, and those who fill out the survey in person at the cancer center will have the option to take the survey at the designated locations in the center. Participants will have approximately one month to take the survey, at which point the data will be compiled and analyzed. The results of this research will be utilized to improve support services, programs, and groups offered at the Community Cancer Center.

SYNTHESIS, CHARACTERIZATION AND PRELIMINARY KINETIC STUDIES OF THE N-ETHYL AMIDE DERIVATIVES OF ALPHA-HYDROXYHIPPURIC ACID

Presenter	Kerkemeyer, Elise Undergraduate, Chemistry
Mentor	Prof. Richard Nagorski

Carbinolamides have been discovered to have an increasing role in a variety of biological venues. It has been shown that carbinolamides are intermediates in the enzyme-catalyzed synthesis of alpha-amidated peptides. Although carbinolamides are important intermediates in the production of these peptide hormones, little attention has been given to the mechanisms the reaction of carbinolamides in water, and, thus, it is difficult to speculate how their reaction is enzymatically catalyzed. The purpose of the work presented here was to synthesize structural analogs of the biological intermediates and study their mechanism of breakdown in water. alpha-Hydroxyhippuric acid, analog of the enzyme intermediate and substrate for the peptidylglycine alpha-amidating monooxygenase, provides an easily modified template for the study of the breakdown of this carbinolamide system. This study focuses on the synthesis of the N-ethyl amide derivatives of alpha-hydroxyhippuric acid and the effect of this modification on the reactivity of the amide compared to the acid derivatives. This modification is of interest as at biological pH the carboxylate group would be ionized and the hydroxide-dependent breakdown of carbinolamides is thought to occur through the ionization of the hydroxyl group the carbinolamide which would lead to the net charge on alpha-hydroxy hippuric acid being -2. The modification of the acyl group results in the proposed intermediate being singularly charged. What will this change have on the reactivity of the amide derivatives of alpha-hydroxyhippuric acid vs. the carboxylate derivatives. The details of the synthesis and the spectral characterization will be presented. In addition, preliminary kinetic studies will be presented and compared with the results found for the alpha-hydroxyhippuric acid derivatives.

THE EFFECTS OF SUPERVISOR TRUST ON EMPLOYEES' REACTIONS TO THE PERFORMANCE APPRAISAL SYSTEM IN PARK AND RECREATION AGENCIES

Presenter	Kianicka, Michal Graduate, Kinesiology & Recreation
Mentor	Prof. Mike Mulvaney
Authors	Michal Kianicka; Mike Mulvaney

Well-designed employee performance appraisals assume great importance by providing park and recreation agencies with information that can guide administrative and developmental decision-making about their most important asset - their human resources. Despite their importance, an agency's performance appraisal system can often be viewed by employees and management as a frustrating and unfair process. Previous research has suggested that performance appraisals do not happen in

isolation, but within a social context. Guided by the existing appraisal research, the purpose of this study is to examine the effects of supervisor trust on employees' reactions to the performance appraisal system. Strategic Human Resource Management (SHRM) theory will serve as the framework for the study. More specifically, SHRM and the existing management literature will guide the development and testing of this hypothesis. Public park and recreation professionals within the Illinois Park and Recreation Association's membership were invited to participate in the study. An online survey was developed to measure the variables of interest including satisfaction with their performance appraisal, satisfaction with the system used during the appraisal, and perceptions of procedural and distributive justice with the appraisal system. Preliminary and substantive statistical analyses was performed to test the study's hypothesis. A discussion of the findings, their implications for management, and recommendations for future research are also provided.

PHILOSOPHY AS A WAY OF LIFE: A DUAL SYSTEMS APPROACH

Presenter	King, Patrick Undergraduate, Philosophy
Mentor	Prof. Daniel Breyer
Author	Patrick King

Philosophy as a Way of Life (PaaWoL), introduced by french philosopher Pierre Hadot in the late 20th century, is often associated with specific schools of thought or fields of inquiry that are relevant to how we should live our lives. Instead, I argue that we should think of PaaWoL as actually living and behaving in line with our philosophical convictions. To do so, I borrow the dual systems model from social psychology, which hypothesizes that we have two distinct cognitive systems: one automatic/associative (System1), the other conscious/propositional (System2). There is evidence to suggest that our behavior is more reliably driven by System1. This, combined with the observation that philosophical beliefs don't always translate into behavior, brings us to a working hypothesis: most of our philosophical beliefs reside in System2, and must be 'imprinted' into System1 if we want to behave in accordance with them. In this project, I first describe the dual systems model in social psychology and present evidence from the literature that certain PaaWoL relevant domains do seem to be governed by two distinct systems. Next, I provide evidence that both systems, while distinct, can be heavily influenced by each other, suggesting that we can in fact bring the two into agreement. I then propose techniques that might help bring our system1 beliefs in line with our system2 beliefs while drawing attention to areas that need more research to show that this is in fact a fruitful way to view PaaWoL. Finally, I compare this framework with Pierre Hadot's original concept of PaaWoL to see if and where the two conflict.

NATURE VS NURTURE: HOW DEVELOPMENTAL ENVIRONMENT INFLUENCES IMMUNE FUNCTION AND COGNITIVE ABILITIES IN DROSOPHILA MELANOGASTER

Presenter	Klingler, Amanda Undergraduate, Biological Sciences
Mentor	Prof. Nathan T. Mortimer
Author	Amanda Klingler; Ashley Waring; Nathan Mortimer

Organisms have evolved highly specialized behaviors and physiological processes that allow them to survive and reproduce under a unique set of ecological conditions. These adaptive traits include things like the immune system, which is important for fighting off infections from other pathogenic organisms, and cognitive processes that allow animals to evaluate and appropriately respond to their current environment. While these traits are well suited to the ecological context in which they evolved, maintaining these systems in altered environmental conditions can become stressful. Life-history theory predicts that when faced with stressful environmental conditions, organisms should make tradeoffs in resource allocation between ensuring future survival and maximizing reproductive potential. Yet, these tradeoffs are not static, but instead can vary between species, or within species experiencing different environmental stressors. The ways animals experience these tradeoffs are also dependent on their life stage. Many studies investigating life history theory attempt to understand how adult animals cope with environmental stressors and allocate remaining resources to maximize their reproductive potential. However, in focusing on the responses of adult animals, these studies fail to consider how stressful ecological conditions may irreversibly alter the developmental trajectory of juvenile animals, which are especially sensitive to environmental perturbations.

In light of the extreme ecological shifts predicted to take place over the next century due to climate change, it is important to understand how juvenile animals may be affected by these changing environmental conditions, and what this may mean for their future survival. In this study, we use *Drosophila melanogaster* as a model organism to understand the interactive effects of two environmental factors (nutrient availability and ambient temperature) on two adaptive life-history traits (immune response and cognitive ability). By raising *D. melanogaster* from hatching in stressful temperature and nutrient conditions and evaluating the development time, immunocompetency, and cognitive function of the emergent adult animals, we will be able to understand 1.) how these conditions influence the developmental trajectory of *D. melanogaster*, 2.) how these conditions influence the immune competence and cognitive function of the adult animals and 3.) the tradeoffs that are made between these important systems to maximize future survival and reproduction under stressful ecological conditions

IMPACTS OF LAND-USE CHANGE ON THE MENOMINEE RIVER IN JO DAVIESS COUNTY, ILLINOIS

Presenter	Konop, Preston Graduate, Geography, Geology, and the Environment
Mentor	Prof. Lisa Tranel

This study addresses land-use changes in Jo Daviess County, Illinois, and their effects on the Menominee River. The Menominee River flows north to south through Jo Daviess County, and southern Grant County, Wisconsin. Many of the surrounding properties are agricultural and have undergone developmental and land-use changes that may affect the flood flashiness of the Menominee River. Heavy rain events caused the Menominee River to reach bank full and overflow stages during several rain events from June to October. Frequent rain events during the sampling period caused soils to become saturated slowing infiltration. These frequent rain events, coupled with saturated soils and impermeable surfaces, increased the amount of runoff and overland flow into the river. Increases in impermeable surfaces have led to greater amounts of runoff during precipitation events causing more sediment to wash into the river. In addition, more intense or longer duration precipitation events will create greater amounts of runoff moving over the landscape and into the Menominee River. Large scale precipitation events also cause more water to flow into the Menominee River rather than infiltrate into the ground, resulting in an increased risk of flood events. Flooding events pose risks to cropland and subdivisions that reside near the Menominee River, which are subject to property or crop damage.

The purpose of this study is to identify the changes in land-use from agricultural to urban impermeable surfaces and how the river reacts. A model will be used to determine the changes over time to the flashiness of the Menominee River and how it corresponds to the increase of impermeable surfaces. Changes in land-use and the stream network will be identified through land cover classifications using digital elevation models (DEM) and aerial imagery. Weather pattern data will be collected for the study area in order to determine the amount of recharge that occurred over the study period. Tracer clasts along with stream cross sections will be used to determine flood water discharge moving through the stream channel. The expected results are that the increase of impermeable surfaces such as buildings and roads will increase the flashiness of the Menominee River.

LONG NON-CODING RNA FUNCTION AS IMMUNE REGULATORS IN DROSOPHILA MELANOGASTER IMMUNITY

Presenter	KR, Pooja Graduate, Biological Sciences
Mentor	Prof. Nathan T. Mortimer
Authors	Pooja KR; Alec Sikarin; Nathan T Mortimer

In nature, fruit flies are regularly infected by parasitoid wasps and mount a cellular immune response following infection. During infection, the wasp injects a developing egg into the fly body cavity, and the presence of the egg is first recognized by immune cells known as plasmatocytes. These plasmatocytes spread around the surface of the egg and form the first layer of the capsule. This triggers the induction of infection-induced immune cells called lamellocytes, that are produced by the transdifferentiation of plasmatocytes or from dedicated hemocytes precursors found exclusively in the *Drosophila* lymph gland. The lamellocytes then migrate towards the wasp egg and attach onto the plasmatocyte covered surface. The mechanisms leading to the production of lamellocytes in the cellular immune response are not completely understood. We identified a novel gene, a long non-coding RNA (lncRNA) that is required for fly cellular immunity and plays a role in the production of lamellocytes. We found that this lncRNA mutant flies fail to elicit an efficient immune response suggesting that it plays an important role in *Drosophila melanogaster* cellular immunity. Interestingly, lamellocyte production was altered in these mutants, resulting in the production of morphologically abnormal lamellocytes. Additionally, we found that this gene is involved in the regulation of lamellocyte production via the activation of JNK signaling pathway. To determine the functional significance of this lncRNA in innate immunity, further work will be done to elucidate the mechanism of action and characterize the genetic interaction with its functional target. Our current understanding of lncRNA function is very limited. However, recent evidence suggests that lncRNAs are involved in various regulatory processes, including *D. melanogaster*, and our findings have uncovered a novel role of lncRNAs in innate immunity.

CATALYTIC FUNCTION OF EMBEDDED GOLD NANOPARTICLES IN C-C BOND FORMING REACTIONS

Presenter	Lartey, Jemima Graduate, Chemistry
Mentor	Prof. Jun-Hyun Kim
Authors	Pascal Eyimegwu; Jun-Hyun Kim

Gold nanoparticles (AuNPs) have been physically encapsulated into polymer particles to serve as highly reactive quasi-homogeneous catalysts in various types of chemical transformation reaction. Although diverse synthetic strategies have achieved great progress in designing catalytically active AuNPs, a major concern in most synthetic methods is the inevitable use of stabilizing or capping agents to prepare the colloidal form of AuNPs against their aggregation in solution unless they are supported onto stable substrates. Furthermore, the presence of stabilizing agents around AuNPs can often minimize and block the readily available active sites of AuNP surfaces, which can greatly reduce their catalytic performance. In this study, we prepared surfactant-free and physically-embedded AuNPs within poly(N-isopropylacrylamide) particles in situ via a light-induced reduction method. The polymer particles did not possess any functional groups to induce strong interactions, but still provided a greatly improved stability to the embedded AuNPs, which resulted in reactive catalysts in homocoupling reactions in pure alcohol and alcohol-rich aqueous solvents under ambient aerobic conditions.

CHARACTERIZING THE ROLE OF EPHRIN SIGNALING PATHWAY GENES IN DROSOPHILA MELANOGASTER IMMUNITY

Presenter	Lee, Jon Undergraduate, Biological Sciences
Mentor	Prof. Nathan T. Mortimer
Author	Pooja KR; Jon Lee; Nathan Mortimer

In nature, the larvae of the fruitfly *Drosophila melanogaster* are regularly infected by parasitoid wasps and mount a cellular immune response following infection. During infection, the wasp injects a developing egg into the fly body cavity, and the presence of the egg is recognized by immune cells to form a multilayered capsule surrounding the wasp egg, thereby killing it. Many of the molecular mechanisms underlying this encapsulation response are conserved with human immune responses, and one such mechanism is the protein N-glycosylation of immune proteins. Protein N-glycosylation is a multifaceted post translational addition of a carbohydrate structure to the protein, and is involved in mediating protein folding, interaction, stability and localization. Recent findings have demonstrated that N-glycosylation plays an important role in the formation of the cellular capsule around the wasp egg. Here, we studied three genes from the Ephrin signaling pathway that could be involved in the glycosylation process, thus influencing the fly cellular immune response. These genes have been implicated in various diseases such as cancer, autoimmune disorders and have also been shown to play an important role during neural development and embryogenesis. However, their role in immunity is not known. We examined the roles of the Ephrin signaling pathway genes in the encapsulation response against parasitoid wasps. Interestingly, we observed that immune cells lacking these genes led to the formation of defective capsules upon wasp infection, ultimately failing to cause wasp death. This was similar to the 'broken capsule' phenotype exhibited by mutants which have defective N-glycosylation and an impaired encapsulation response. Our findings demonstrate that these genes are vital to the *Drosophila* immune response and this system will provide further insight into the genetic complexity and mechanisms underlying the role of protein N-glycosylation in human immunity.

PROGRESS TOWARDS THE BONDING OF MULTIDENTATE LIGANDS TO METAL CLUSTER CORES

Presenter	Lopez, Elizabeth Undergraduate, Chemistry
Mentor	Prof. Lisa Szczepura
Authors	Elizabeth Lopez; Lisa Szczepura

Research in the Szczepura group focuses on the study of transition metal, mostly rhenium (Re) based, cluster complexes which contain the $[\text{Re}_6\text{Se}_8]^{2+}$ cluster core. My project involves the coordination of multidentate ligands to this cluster core. Multidentate ligands are used extensively in single metal coordination chemistry to control reactivity of the metal center. This presentation will focus on the preparation of a precursor complex, $[\text{Re}_6\text{Se}_8(\text{NCCMe}_3)_6]^{2+}$ and our attempts at coordinating the tridentate N-donor ligand, tpomb, to the cluster core with the goal of generating $[\text{Re}_6\text{Se}_8(\text{tpomb})(\text{NCCMe}_3)_3]^{2+}$. Characterization techniques utilized include nuclear magnetic resonance spectroscopy and mass spectrometry.

THE PERCEIVED EFFECTIVENESS OF AUTONOMY-SUPPORTIVE AND CONTROLLING COACHING STYLES

Presenter	Love, Kayla
	Graduate, Kinesiology & Recreation
Mentor	Prof. Tony Amorose

All coaches develop a relationship with their athletes. However, not every coach and athlete experience the same quality of the relationship. The quality of the athlete's relationship with their coach, as well as their sport experience overall, will be heavily influenced by the behavior and leadership styles exhibited by the coaches. Given this, understanding which coaching behaviors athletes believe are more or less effective is an important goal. Autonomy-supportive behaviors are behaviors from an authority figure that provide choice and support an individual to be independent. These behaviors are known to have positive outcomes, such as increased motivation (Mageau & Vallerand, 2003). Unlike autonomy-supportive behavior, controlling behaviors are behaviors that restrain or manipulate an athlete. Recent studies have shown that controlling behaviors hurt athletes (Bartholomew et al., 2009). However, a few studies in sport and education have suggested that controlling behaviors may be seen as indicators of effectiveness (Boggiano et al., 1993; Flink et al., 1990; Becker and Solomon, 2009). The purpose of this study is to determine how collegiate athletes perceive their coach's behaviors and if there are differences in the perceived effectiveness of autonomy-supportive and controlling coaching styles. Based on prior research (Haerens et al., 2018; Matosic & Cox, 2014), this study will examine the combined effects of autonomy-supportive and controlling styles using a person-centered approach to analyze the data.

EFFECTS OF IN OVO TREATMENT WITH ETIOCHOLANOLONE ON NESTLING DEVELOPMENT

Presenter	Lusk, Elliot Graduate, Biological Sciences
Mentor	Prof. Joseph Casto
Author	Elliot Lusk; Trevor Witek; Joseph Casto

When transferred to egg yolks during oogenesis, maternally derived testosterone can alter offspring phenotypes. However, avian embryos readily metabolize testosterone to etiocholanolone early in incubation. Thus, it remains unclear whether testosterone or etiocholanolone mediates the phenotypic effects of maternal yolk testosterone, or whether this metabolism serves to inactivate the maternal steroid signal. Previously, injection of artificially incubated European starling (*Sturnus vulgaris*) eggs with etiocholanolone resulted in no detectable changes in embryonic phenotype after five days of incubation; however, few phenotypic traits were readily assessed at that embryonic age. Here, we examine the effects of in ovo etiocholanolone treatment on starling nestling phenotypes throughout nestling development. On the day they were laid, eggs were marked, injected with 5 ng of etiocholanolone in sesame oil, oil alone, or left uninjected, and returned to nests to complete incubation. The fates of eggs and their resulting nestlings were followed through fledging. At five, ten, and fifteen days of age, structural growth was assessed, and blood was collected to assess hematological development, blood glucose, and corticosterone titers. Pre- and post-hatching nesting success was similar among treatments and the percent of eggs hatched was affected by complications associated with injection, but not the addition of etiocholanolone. Structural growth, plasma concentrations of the metabolic hormone corticosterone, and hematological development were also largely unaffected by experimental treatment with early hematocrit levels being affected by oil itself and not etiocholanolone. Our analyses support the idea that embryonic metabolism of testosterone to eticholanolone serves to inactivate a maternal signal that influences offspring development rather than mediate the maternal effects of that signal.

AVOIDANT, BUT READY TO CHANGE? FACILITATING HELP-SEEKING FOR AVOIDANT HELP-SEEKERS

Presenter	Maciejewski, Madison Undergraduate, Psychology
Mentor	Prof. Daniel Lannin
Authors	Madison Maciejewski; Daniel Lannin

A. Purpose:

Help-seeking styles and readiness to change may be important individual differences that influence the beliefs that individuals hold regarding mental health treatment. Help-seeking styles include deferring the responsibility for resolving their problem to another person (dependent help-seeking), flexibly garnering verbal guidance and advice that will aid in finding their own solution (autonomous help-seeking), and eschewing all forms of aid from others (avoidant help-seeking; Komissarouk, Harpaz, & Nadler, 2017). Readiness to change refers to one's willingness to consider trying a new approach to one's problems and relates to perceived self-efficacy in the domain where change is being considered (Prochaska, 2009; Zimmerman & Olsen, 2009). Therefore, we predicted that help-seeking styles and readiness to change would both predict help-seeking beliefs, and that readiness to change would buffer the negative effect of an avoidant help-seeking style.

B. Methods

In exchange for course credit, university students (N = 618; Age, M = 19.52, SD = 2.04; Sex, Female = 78.8%, Male = 20.9%, Self-Identify = 0.3%) who reported moderate and severe levels of psychological distress (M 10.18, SD = 4.22; Range: 5-24; cf. Kessler et al., 2002; Prochaska et al., 2012) completed online assessments of avoidant, autonomous, and dependent help-seeking styles (Komissarouk et al., 2017), readiness to change (cf. LaBrie, Quinlan, Schiffman, & Earlywine, 2005), and positive help-seeking beliefs (Aegisdottir & Gerstein, 2009).

C. Results

Multiple regression analyses indicated that previous counseling and distress accounted for 4% of the variance in positive help-seeking beliefs. Including autonomous ($\beta = 0.25$, $p < .001$), dependent ($\beta = 0.04$, $p = .297$), and avoidant ($\beta = -0.12$, $p = .004$) help-seeking styles increased the amount of variance explained by 12% ($R^2 = 0.16$); including readiness to change increased the amount of variance explained by 3% ($R^2 = 0.19$), all $ps < .001$. A PROCESS (Hayes, 2017) moderation analysis indicated a significant interaction between avoidant help-seeking and readiness to change ($p = .003$); As shown in Figure 1, avoidant help-seeking's negative association with positive help-seeking beliefs was weaker when readiness to change was high.

D. Conclusions

The present study found that autonomous and avoidant help-seeking styles demonstrate opposing relations with positive help-seeking beliefs. Readiness to change may buffer the negative effect of an avoidant help-seeking style on beliefs about professional help. Bolstering readiness to change may facilitate help-seeking for resistant individuals.

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DETERMINING THE RELATIONSHIP BETWEEN AGING AND OXIDATIVE STRESS

Presenter	Majewski, Aleksandra Graduate, Biological Sciences
Mentor	Prof. Nathan Mortimer
Co-Mentor	Prof. Alysia Mortimer

Aging is inevitable for all organisms and can be characterized by degeneration of tissue, a decrease in motor function, and impaired stress response. In humans, it is often accompanied by an increased propensity for age related diseases. While all adults experience biological aging (senescence) not all adults experience age-associated disease. Thus, we claim these are not normal prospects of aging. Although the implications of aging are well understood, the molecular underpinnings for these processes remain elusive. As advances in medical science have been successful at prolonging the lifespan of people, they concurrently extend the amount of time spend in diseased states. If we wish to increase the amount of time spend in health, it is important we understand the molecular pathways governing senescence. The research for this thesis project focuses on one of the several theories of aging called the free radical theory. It postulates that that cause of aging is the accumulation of damage in individual cells due to oxidative stress. To investigate this, we use the well-established model organism *Drosophila melanogaster*. In *Drosophila*, there is a known regulator of both aging and oxidative stress (p38b) that is conserved in humans. Studying the interaction partners of p38b can help us understand what pathways p38b is associated with and can eventually help us answer why we age. In this study we find the binding partners of p38b under various ages and oxidative stress exposures in *Drosophila melanogaster* to determine the link between aging and oxidative stress.

HEAT WAVES PRODUCE ECOLOGICALLY RELEVANT EXPRESSION PROFILES FOR TEMPERATURE-RESPONSIVE GENES

Presenter	Marroquin-Flores, Rosario Graduate, Biological Sciences
Mentor	Prof. Rachel Bowden
Co-Mentor	Prof. Ryan Paitz
Authors	Rosario A Marroquin-Flores; Nathan T Mortimer; Ryan T Paitz; Rachel M Bowden

The red-eared slider turtle (*Trachemys scripta elegans*), exhibits temperature-dependent sex determination (TSD), where sex-specific genetic profiles are produced in response to incubation temperature. Despite over 50 years of study on this topic, we still do not fully understand how temperature affects the molecular mechanisms underlying TSD, and prior studies aimed at characterizing genes in the sex-determining pathway have primarily used constant incubation temperatures. Such studies fail to capture the thermal variability that developing embryos naturally experience but have been used to identify potential candidate genes in the sex-determining pathway. One candidate, cold-inducible RNA-binding protein (Cirp), has sex-specific expression in several species of turtles and other reptiles under constant incubation conditions. We characterized Cirp expression in the gonads of *T. s. elegans* embryos exposed to temperatures that better mimic natural nest conditions. All eggs were incubated for the first 24 days at male-producing temperatures (MPT; $25.0 \pm 3^{\circ}\text{C}$) before a subset were shifted to female-producing temperatures (FPT; $29.5 \pm 3^{\circ}\text{C}$) to induce ovarian development via a simulated heatwave. Embryonic gonads were sampled on day 24, then sampled from both FPT and MPT for five consecutive days. In contrast to results from constant temperature studies, we found that Cirp expression did not differ in embryos at either MPT or FPT. We then submitted a subset of our samples for RNAseq to identify genes exhibiting differential expression (DE) in the gonads of embryos at FPT and MPT. We found 75 genes to be upregulated and 104 genes to be downregulated by day 5 of the heatwave. We then analyzed RNAseq data from a study that used constant incubation temperatures and found 864 upregulated genes and 962 downregulated genes in the gonads of embryos at the same stage of development. Only 69 DE genes were shared between the constant and fluctuating temperature datasets. Our comparison of gene expression under constant and fluctuating conditions demonstrates that many of the genes that are differentially expressed under constant conditions are not differentially expressed under more natural incubation conditions. These findings highlight the importance of using ecologically relevant conditions to identify genes expressed during early gonadogenesis in TSD species.

CAMPUS INVOLVEMENT, GPA AND PSYCHOLOGICAL DISTRESS: COLLEGE ADJUSTMENT AND SOCIAL SUPPORT AS MEDIATORS

Presenter	Marsh, Elizabeth Undergraduate, Psychology
Mentor	Prof. Suejung Han
Authors	Elizabeth Marsh; Suejung Han

Students who are involved on campus have better mental health and academic performance (Bergen-Cico & Bylander, 2011; Bergen-Cico & Viscomi, 2013). However, why and how campus involvement promotes mental health and academic achievement has not been examined sufficiently. I hypothesized that campus involvement would be associated with overall better mental health via perceived social support, and higher GPA with perceived college adjustment. A sample of 353 college students participated in an online survey. The survey included demographic questions, Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, & Farley, 1988), College Adjustment Scale (Rice & Dellwo, 2002) with GPA, and the Depression Anxiety Stress Scale (Lovibond, & Lovibond, 1995). A path analysis with AMOS 22.0 revealed an adequate fit to the data, $\chi^2(4)=7.91$, $p=.10$, CFI = .97, RMSEA = .05, 90% CI = .00, .11. Campus involvement was associated with perceived academic adjustment ($\beta = .33$, $p = .002$), which was associated with GPA ($\beta = .50$, $p < .001$), as predicted. However, campus involvement was not associated with perceived social support ($\beta = .07$, $p = .18$), although perceived social support was associated with distress ($\beta = -.27$, $p < .001$). Students who are involved on campus perceive themselves to be well adjusted to college and higher levels of social support reduces distress, which is why they perform better academically. Therefore, to help college students adjust to college and have better mental health students should get involved on campus and participate in programs that increase their levels of social support. Universities should provide ways for students to gain social support throughout their years on campus. Future research could find strategies to improve college adjustment, while reducing distress among college student. Keywords: college adjustment, campus involvement, social support, psychological distress.

NARCISSISM AND EMPATHY: DIFFERENCES IN CONCERN FOR OTHERS AND HELPING BEHAVIORS

Presenter	Marsh, Elizabeth Undergraduate, Psychology
Mentor	Prof. Suejung Han
Authors	Miette Daluga; Elizabeth Marsh; Suejung Han

Purpose: Narcissism is defined as an inflated sense of self and self-absorption (Wetzel et al., 2019) Empathic tendency refers to the understanding and recognizing other individuals' emotions (Carré, Stefaniak, D'Ambrosio, Bensalah, & Besche-Richard, 2013). These definitions suggest that narcissism and empathy could be associated with concerns for others in need and helping behaviors in opposite ways, but research findings are mixed. For example, people with narcissism could feel concerned for and help others to feel powerful over them, or they could just dismiss others' need due to self-absorption (Kang & Lakshmanan 2018). On the other hand, people with empathy may offer help readily due to their concern for others or may be overwhelmed by concerns and not offer effective help (Lebowitz & Dovidio 2015) Therefore, this study aimed to clarify whether narcissism and empathy are differentially associated with concerns for others and various behavioral responses to others in need.

Procedure: A sample of 256 college students (age $M = 19.26$, 38 males, 186 females, 7 other) participated in this online study. The survey included demographic questions, Basic Empathy Scale in Adults (Carré et al., 2013), and Narcissistic Personality Inventory-40 (Raskin & Terry 1988). Completing the two scales, participants watched a one-minute video that the author created with volunteer actors in which a man was sexually harassing a woman, followed by questions about concern for the woman and behavioral responses of choice (i.e., call 911, help-seeking, intervene, observe, walk away, find safety).

Results: Correlational analyses revealed that empathy was associated significantly with concern for the woman ($r = .26$, $p < .001$) but narcissism was not ($r = -.08$, $p = .22$). One-way ANOVAs with narcissism and empathy as DVs and behavioral responses as IV showed that those who chose "walk away" response scored significantly low on empathy, $F(5,207) = 2.89$, $p = .02$, whereas there was no mean difference in narcissism, $F(5,212) = 1.41$, $p = .22$.

Conclusions and Implications: The results suggest that unlike people with empathy who care about and help others, people with narcissism do not show consistent patterns of emotional or behavioral responses to others in need. This indicates a possibility of a moderator. For example, those with high narcissism may not offer assistance to others when they view empathy as a strenuous effort (vs. as a way to show off their superiority; Cameron et al, 2019). This speculation should be tested in future research.

PERFECTIONISM AND ATTENTION BIAS: MODIFIED STROOP TASK

Presenter	Marsh, Elizabeth Undergraduate, Psychology
Mentor	Prof. Jeffery Kahn
Authors	Elizabeth Marsh

Perfectionism can be defined as a personality trait characterized by high standards for performance (Frost et al., 1990) and a striving for flawlessness (Flett & Hewitt, 2002). Attentional bias can be defined as a systematic preference to allocate attention towards specific types of stimuli (Bar-Haim et al., 2007; Howell et al., 2016). Shafran et al. (2002) proposed that perfectionism has an attentional bias that focuses significantly more attention to negative information than positive information. This selective attentional bias increases processing of negative stimuli and prioritizes it over positive stimuli which leads to cognitive distortions such as discounting success and overgeneralizing failure (Egan et al., 2011; Shafran et al., 2010). Research has found that perfectionists display a significant bias towards negative information in attention tasks (Howell et al., 2016; Kobori & Tanno, 2012; Tonta et al., 2019). The present study is needed to address limitations of the previous studies, attempt to replicate their results with an English-speaking population, and possibly provide support for Shafran et al.'s (2002) model of perfectionism which has implications for treatment of multiple disorders. The proposed study aims to examine the relationship between perfectionism and attention bias. Approximately 50 college students at Illinois State University will be recruited. The study will use a modified emotional Stroop task, the Almost Perfect Scale - Revised, and the Depression Anxiety Stress Scale. Participants will also be asked to list any words they remember from the Stroop task. The emotional Stroop task will contain words from five categories; positive perfectionism relevant, positive perfectionism irrelevant, neutral, negative perfectionism irrelevant, and negative perfectionism relevant. The words will be in one of three randomly allocated colors (red, blue, green). Participants will be asked to click on a key (left, down, right arrows) corresponding to the color of the text the word is written in. The response time and number correct will be recorded, as well as the number of words from each category participants remember. Participants will complete the Stroop task followed by the questionnaires on a computer in a private laboratory space. Predicted results are expected to show that high perfectionists have a stronger attention bias for negative information than low perfectionists. It is also predicted that maladaptive perfectionists will have an attention bias for negative perfectionism relevant information while adaptive perfectionists will have an attention bias for positive perfectionism relevant information. Relevance, limitations and future research will be discussed.

Keywords: perfectionism, attention bias, Stroop task

PRIMED KNOWLEDGE ON ADHD SYMPTOMS INCREASE NUMBER OF REPORTED ADHD SYMPTOMS

Presenter	Marsh, Elizabeth Undergraduate, Psychology
Mentor	Prof. Suejung Han
Authors	Sydnee Barrins; Elizabeth Marsh; Suejung Han

Purpose

Health care providers face unique challenges in diagnosing adult patients with attention-deficit/hyperactivity disorder (ADHD) (Adler et al., 2009), such as the concern for overreporting of the ADHD symptoms among college students (Nelson & Lovett, 2019). This overreporting and resulting unnecessary medications can lead to negative consequences (Courrégé et al., 2019) such obsessive-compulsive behaviors, psychotic episodes, liver failure, stroke, and cardiac arrest (Graham & Coghill, 2008). One possible reason for overreporting could be the public availability of information about ADHD symptoms. This may prime individuals, consciously or non-consciously, leading to overreporting or exaggerating symptoms. Thus, this study examined the impact of such priming on potential overreporting of ADHD. I hypothesized that students who were exposed to knowledge about ADHD would report a higher number of ADHD symptoms compared to those who were exposed to irrelevant knowledge (i.e., vegetarianism).

Procedure

A sample of 157 college students (18 males, 139 females, mean age = 19.10) participated in this online survey study. The randomly assigned experimental group read a one-page passage on ADHD symptoms, whereas the control group read one on vegetarianism. The passages were followed by three questions designed for manipulation check, Adult ADHD self-report scale items (Adler et al., 2006) and demographic questions.

Results

The data collection is in progress and complete results will be presented at the conference if accepted. A preliminary one-way ANOVA using SPSS with the ADHD vs. Vegetarianism reading conditions as the independent variable and ADHD symptoms scores as the dependent variable did not reveal a significant group mean difference, $F(1, 152)=2.00, p=0.16$. A supplementary analysis with women only, however, revealed that the ADHD reading group scored higher on the ADHD report scale than the control group, $F(1, 134)=4.30, p=.04$.

Conclusion

The hypothesis was supported only among women. It is possible that women are more likely to be influenced by information presented to them (Eagly, 1983); however, complete analyses with a larger sample will clarify the meaning of the gender difference observed in the preliminary analysis. The findings that follow from this study provide more compelling evidence that research is needed in the validity of self-reporting from clients, especially in the domain of ADHD, particularly given its rapidly increased prevalence and health consequences of ADHD medications for those who do not have it.

UNDERSTANDING THE ROLE OF GARS IN CHARCOT-MARIE-TOOTH DISEASE

Presenter	Martin, Julia
	Graduate, Biological Sciences
Mentor	Prof. Alysia Vrailas-Mortimer
Authors	Julia Martin; Alysia Vrailas-Mortimer

Charcot-Marie-Tooth disease (CMT) is a type of inherited peripheral neuropathy which causes degeneration of motor and sensory axons, leading to symptoms such as progressive muscle weakness and sensory loss, numbness, and pain. CMT neuropathies are among the most common types of hereditary neurological conditions, affecting 1 in 2,500 people who currently have no treatment options aside from managing the symptoms. Over 70 genes that play a role in a wide variety of cellular processes have been found to be associated with CMT. This highlights the complexity and diversity of the disease, but also begins to provide insight on potential molecular therapeutics to treat it. CMT2D is a specific type of CMT caused by dominant mutations in the GARS gene, which codes for glycyl-tRNA synthetase. The reasoning behind these phenotypes is unclear, as the translational function of GARS is required in nearly all cell types. The association of GARS and CMT2D indicates that it also has a role in maintaining peripheral neurons, but the mechanisms remain unknown. We find that the stress response protein, p38 MAPK (p38Kb) regulates the protein levels of GARS with aging. Loss of p38Kb causes locomotor dysfunction and sensory loss, similar to the symptoms seen in CMT2D. Using the established CMT model *Drosophila Melanogaster* to determine the mechanisms by which GARS and p38Kb interact to promote neuromuscular health, we may shed light on how to develop molecular therapeutics to treat CMT2D.

FROM SMOKE CLOUDS TO VAPE CLOUDS: A STUDY OF SUBSTANCE USE AND DELINQUENCY

Presenter	Maynard, Christian Undergraduate, Sociology/Anthropology
Mentor	Prof. Winfred Avogo
Author	Christian Maynard

The 'vaping epidemic' has incurred at least 12 deaths and 805 injuries so far. Overall, research on vaping has been substantially limited, primarily in the context of vaping and delinquency. This study's purpose is to investigate the correlations between vaping and smoking and the various kinds of delinquent acts. Using secondary data from Monitoring the Future: A Continuing Study of the Lifestyles and Values of Youth conducted in 2017, with a sample size of 21,188 participants, we find that youth 'vapors' were associated with less delinquency than youth smokers(cigarettes); however, youth 'vapors' were associated with more delinquency than alcohol users. Finally, young people who vape were more likely to report smoking and drinking alcohol. We interpret these results in the context of social bonding and social learning theory and policies to create awareness on the potential dangers of vaping.

MENTAL HEALTH CRISIS

Presenter

McCall, Kevin
Graduate, Social Work

Mentor

Prof. Chris Gjesfjeld

Understanding our current local system (McLean County, Illinois) of available services for the treatment of mental health crisis is essential in creating and implementing best practice strategies to address existing gaps and barriers related to those services. This review explores the transition to the current model of community mental health services as well as McLean County's involvement and increased ownership over source for mental health treatment. A new source of data collection may prove to be a valuable resource for better understanding mental health crisis and primary needs of those experiencing a crisis.

PERCEIVED SOCIAL SUPPORT GIVEN TO INJURED COLLEGIATE ATHLETES BY THEIR HEAD COACHES, ASSISTANT COACHES, TEAMMATES, AND ATHLETIC TRAINERS

Presenter	McCauley, Darby Graduate, Kinesiology & Recreation
Mentor	Prof. Nicole Hoffman
Author	Darby McCauley; Chelsea Kuehner; Nicole Hoffman;

Injuries sustained during an athlete's career can be detrimental and may not only cause physical harm, but may cause psychological distress and resulting questions of identity, roles, and purpose. Social support is commonly defined as individuals whom are readily available, reliable, and let us (the recipient of social support) know that they care about, value, and love us. Social support is one way that clinicians and others who are close to the athlete can focus on helping the whole patient and meeting both their physical and mental needs more effectively throughout the course of an injury. Unfortunately, social support is often overlooked and evidence is minimal. The purpose of this study is to determine the satisfaction of social support given by head coaches, assistant coaches, teammates, and Athletic Trainers to their student-athletes throughout an injury, as perceived by the student-athlete. Athletic Trainers distributed anonymous online surveys to eligible student-athletes at NCAA Division 3 and NAIA universities in the central Illinois area. Sixty complete surveys (60.6% response rate) were available for analysis. The survey was distributed and completed through a secure Qualtrics website. The survey analyzed 8 different types of social support and how much the student-athletes were satisfied with the social support that they received from their head coaches, assistant coaches, teammates, and Athletic Trainers. We aim to identify potential differences between the types of social support given to the injured student-athlete from these different individuals. This research may help guide Athletic Trainers and other healthcare professionals with understanding the importance of social support and bring light to a subject that has been overlooked.

RAPID SCREENING OF HIGH PRIORITY N-NITROSAMINES IN PHARMACEUTICAL, FORENSIC, AND ENVIRONMENTAL SAMPLES WITH FCSI-MS AND PSI-MS

Presenter	McDaniel, Trevor Graduate, Chemistry
Mentor	Prof. Christopher Mulligan
Authors	Trevor McDaniel; Jessica Holtz; Makoy Overfelt; Christopher Mulligan

N-nitrosamines, which are currently being recalled and tracked by the FDA in select pharmaceutical tablets, are a class of dangerous carcinogenic compounds that have a track record of appearing in food, drinking water, soil, and as a poison in forensic evidence. The burgeoning concern of N-nitrosamine contaminations found in various pharmaceutical compositions has increased the demand for rapid and reliable screening methods to better understand the breadth of the problem. In this work, two spray-based, ambient ionization methods were validated toward the rapid and cost-effective screening of trace level nitrosamines in complex matrices.

Two ambient MS methods were employed for this work, including paper spray ionization (PSI) for liquid-phase samples and filter cone spray ionization (FCSI), a newly-reported technique capable of trace screening of priority analytes from complex matrices while ensuring instrumental hygiene, for solid-phase samples. A variety of matrices of recent concern were investigated, including ranitidine tablets, food types used for poisoning in past forensic casework (e.g. lemonade, cinnamon bread, etc.) and environmental samples (e.g. drinking water, soil). For detection limit studies, mock samples were produced via spiking of serially-diluted analytical standards (Sigma Aldrich). All MS data were collected on a Thermo-Scientific LCQ Fleet (Waltham, MA) quadrupole ion trap mass spectrometer, utilizing Excalibur software for data analysis.

ARE PURPLE CONEFLOWERS BLOOMING EARLIER DUE TO INCREASED TEMPERATURE ASSOCIATED WITH CLIMATE CHANGE?

Presenter	McDermott, Zachary Undergraduate, Biological Sciences
Mentor	Prof. Diane Byers
Authors	Zachary McDermott; Diane Byers

The timing of flowering for plants is determined by seasonal environmental changes, which the plants use as signals to begin or delay flowering. These environmental signals include temperature which has been increasing earlier in the spring and summer months due to climate change. It has been documented that in response to this earlier warming early spring woodland plants are flowering earlier in the season. I am interested in determining if the summer flowering prairie plants (purple coneflowers) are altering their flowering time in response to this warming. I will focus on several species of purple coneflowers: pale purple coneflower (*Echinacea pallida*); eastern purple coneflower (*E. purpurea*); and narrow-leaved purple coneflower (*E. angustifolia*). These species differ in their geographic ranges, but all are found native prairies in midwestern USA. They or related cultivars are commonly grown in gardens, used in prairie restorations and used as herbal remedies. To determine if the plants have changed their flowering time, first I will need to establish a record of their historical flowering time. I will accomplish this using plant preserved in herbariums located across Illinois. Herbariums preserve plants by drying them and mounting them on sheets of heavy paper that includes the collection data and location. I will measure and record the flowering stage of purple coneflower specimens. Using the flowering information along with the collection date and location, I will be able to create a historical record for the purple coneflowers in Illinois. I have obtained detailed temperature records from the National Weather Service from our region. After I have completed making the historical flowering records, I will be using regression analysis to assess if the warming temperatures have altered the flowering time of purple coneflowers. Our environment is changing, and this research will determine if prairie plants are responding to this change.

MATHEMATICAL MODELING OF A THERMOSENSITIVE NEURON IN C. ELEGANS

Presenter	Mobille, Zachary Graduate, Mathematics
Mentor	Prof. Epaminondas Rosa
Authors	Zach Mobille; Andres Vidal-Gadea; Olcay Ackman; Epaminondas Rosa

It is well established within the community of neuroscientists who study the nematode *C. elegans* that this organism responds to very acute temperature changes within its environment. *C. elegans* does so in order to guide its movement along isotherms and thus maintain homeostasis. Furthermore, the Amphid finger-like ciliated (AFD) neuron in *C. elegans* is known to be the primary cell responsible for transducing temperature-encoded signals. The primary goal in this work is to establish a mathematical model for the AFD neuron in regards to its response to temperature changes via intracellular calcium dynamics. Our model consists of a set of six differential equations with the first three equations representing neuronal outputs in a single cell corresponding to three spatial compartments (dendrite, soma and axon), and the remaining three equations represent each compartment's activation function. We introduce temperature effects in a fashion similar to the approach used by Martin Huber and Hans Braun in their work on modeling thermo-sensitive neurons. Eventually, we plan on extending our model to include a theoretical framework of magneto-reception in *C. elegans* by the AFD neuron.

MATHEMATICAL MODELING OF A THERMOSENSITIVE NEURONS IN C. ELEGANS

Presenter	Mockenhaupt, Alice Undergraduate, Special Education
Mentor	Prof. Yun-Ching Chung

A Service-Learning Experience at a Foster Care Home for Children with Disabilities in Beijing, China Alice Mockenhaupt, Illinois State University In China, different policies and organizations protect educational rights and provide services for children with disabilities. This poster focuses on a personal service-learning experience at a foster care organization for children with disabilities in Beijing, China. During a two-week period, I volunteered at Alenah's Home and assisted the staff and other volunteers with providing daily services and supports to young children with disabilities. In this poster, I share the background of Chinese special education law and policy, compare and contrast special education laws in the United States and China, and discuss supports and services provided at the foster home.

THE PHILOSOPHICAL AND ARTISTIC SEARCH

Presenter	Molnar, Spencer
	Graduate, Art
Mentor	Prof. Daniel Breyer
Co-Mentor	Prof. Tyler Lotz
Author	Spencer Molnar

Whether it be looking at something from above or below. Or attempting to understand different political opinions, it is hard to refute the fact that in daily life we are constantly confronted by different perspectives. My artistic research and exposure to different philosophies, as well as visual psychology, have fostered the notion that attempting to understand the world through multiple perspectives is natural to our human behavior and psyche. It seems as though humankind has endlessly strived to reconcile seemingly opposing views. In a sense, you might say that collectively (and individually) we have attempted to make “wholes” out of a fragmented world. One of the most widely accepted forms of visual psychology to describe this phenomenon would be the gestalt principal of closure. Closure attempts to explain how human perception is inclined to see forms in a complete state, despite the absence of one or more of their parts. A seemingly opposing perspective to gestalt’s principle of closure might be observed in the philosophical idea of anattā, which is a Buddhist doctrine that identifies a person’s “self” as constantly undergoing change. Therefor making a “self” imperceptible. My claim however, is that principals such as closure explain how individuals can distinguish a “self” through phenomenal experience – an idea that would not be dissimilar to constructing meaning through experience. Systematic investigations within my painting practice have allowed me to come to this conclusion. And, unlike more conventional forms of research, visual art opens up new ways to understand conceptual ideas that are not strictly data-driven. Instead, visual art (as well as philosophy) provide a space to nurture and understand ideas in a way that is as fluid as our ever-changing world.

2-, 3- AND 4-BODY DECAYS IN THE CONSTRUCTIVE STANDARD MODEL

Presenter	Moore, Anne Undergraduate, Physics
Mentor	Prof. Neil Christensen
Authors	Neil Christensen; Bryan Field; Santiago Pinto

We further develop the massive constructive theory of the Standard Model and use it to calculate the amplitude and squared amplitude for all 2-body decays, a collection of weak 3-body decays as well as Higgs decay to four neutrinos. We compare our results with those from Feynman diagrams and find complete agreement. We show that in all the cases considered here, the amplitudes of massive constructive theories are significantly simpler than those resulting from Feynman diagrams. In fact, a naive counting of the number of calculations required for a matrix-element generator to compute a phase-space point is orders-of-magnitude smaller for the result coming from the constructive method suggesting that these generators might benefit from this method in the future even in the case of massive weak amplitudes.

COMPARISON OF BIOGAS PRODUCTION USING DIFFERENT DIGESTER OPERATIONAL STRATEGIES

Presenter	Moran, Trevar Undergraduate, Health Sciences
Mentor	Prof. Liangcheng Yang
Authors	Trevar Moran; LC Yang

Biogas was produced from anaerobic digestion of agricultural wastes. Different operational strategies, in terms of retention time and loading capacity, were applied. Biogas composition and volume were analyzed periodically. The results were compared using statistical methods.

MTSS FIDELITY IN SECONDARY EDUCATION (NCHS)

Presenter

Neitzel, Lauren
Graduate, Social Work

Mentor

Prof. Kate Sheridan

This proposed study seeks to examine the use of Multi-Tiered System of Support (MTSS) interventions among teachers at Normal Community High School. The setting for the study is Normal Community High School in Unit 5 School District in Normal, IL. Research participants will be adults aged 18 years of age or older who are teachers, teacher aides, interventionists, and other school support staff. There will be an electronic survey. The survey seeks to understand participant knowledge of MTSS interventions, their skill level in developing and implementing these practices, and their attitude about implementing MTSS. Findings are intended to inform teachers and administrators regarding the use of MTSS, barriers to implementing these interventions, and needs of teachers.

EMPLOYEE JOB SATISFACTION AND STRESS AMONG STAFF AT THE PAVILION BEHAVIORAL HEALTH CENTER IN CHAMPAIGN, IL

Presenter	Nguyen, Veronica Graduate, Social Work
Mentor	Prof. Kate Sheridan

This study explored employee satisfaction among staff at The Pavilion Behavioral Health Center in Champaign, IL. . The results will inform management in recognizing areas in which employee morale and job satisfaction can be improved. It is hoped that this information will support higher retention rates with employees.

NEW METHOD FOR STUDYING THE EFFECTS OF EXERCISE IN DROSOPHILA MELANOGASTER

Presenter	Niswonger, Dana Graduate, Biological Sciences
Mentor	Prof. Andres Vidal-Gadea
Co-Mentor	Prof. Alysia Vrailas-Mortimer
Author	Dana Niswonger; Andres Vidal-Gadea; Alysia Vrailas-Mortimer

Duchenne Muscular dystrophy (DMD) is a muscular degenerative disorder that causes muscle weakness, muscle degeneration, and fatigue. Current treatments include steroid regimens and low-impact exercise. DMD is caused by mutations in dystrophin, which anchors actin to the extracellular matrix through the Dystroglycan Complex (DGC). Previous studies in *C. elegans* have shown that dedicated exercise regimens, particularly through burrowing, have exacerbated dystrophic phenotypes in worm DMD models. The effects of dedicated exercise in *Drosophila melanogaster*, another DMD model organism, are currently unknown. Here we describe a simple, affordable method that can be used to induce constant, directed burrowing exercise in *Drosophila melanogaster* larvae for use in neuromuscular and behavioral research. We find that our assay can induce larval burrowing behavior and that dystrophin mutants have impaired burrowing.

ADSORPTION BEHAVIOR OF CHEMICALLY/CHARGED MODIFIED ANTIBODIES ON GOLD NANOPARTICLES

Presenter	Okyem, Samuel
	Graduate, Chemistry
Mentor	Prof. Jeremy Driskell

Gold nanoparticles have been exploited in the various domains of science such as drug deliver, biosensing, immunoassay and environmental sensors, due to their optical properties and intriguing surface chemistry. Different scientific procedures have been used to effectively immobilized antibodies onto gold nanoparticles. Although acceptable outcomes have been achieved in the immobilization of antibodies onto gold nanoparticles, the sensitivity of these immobilized antibodies to target antigen or binding sites is limited due to improper orientation of the antibodies. There is some evidence that the surface charge of antibodies is responsible for controlling the orientation upon adsorption to gold nanoparticles. Antibodies have ubiquitous lysine residues which are protonated at physiological pH contributing to the total surface charge of the antibody. Chemical modification of antibodies by reacting with NHS acrylic acid, acetylate the lysine residues consequently controlling the surface charge of the antibodies and potentially impacting the orientation. In this proceeding, novel analytical techniques are being utilized to directionally adsorb charge modified antibodies onto citrate capped gold nanoparticles to increase the amount of exposed active site. Dynamic light scattering, fluorescence, nanoparticle tracking analysis and other analytical strategies have been used to study the adsorption dynamics as well as the orientation of these charged modified antibodies on gold nanoparticles. Key Words. Charged Modified Antibody, Gold nanoparticles, Immunoassay.

DEVELOPMENT AND EVALUATION OF A RESILIENCE-BASED EDUCATIONAL PROGRAM FOR FIRST-YEAR COLLEGIATE STUDENT-ATHLETES

Presenter	O'Neil, Liam Graduate, Kinesiology & Recreation
Mentor	Prof. Scott Pierce
Authors	Liam O'Neil; Scott Pierce; Eric Martin; Kelly Rossetto

The transition from high school to college brings many challenges, yet also presents the opportunity for personal growth and development (Compas, Wagner, Slavin, & Vannatta, 1986; Gayles & Baker, 2015). Academically and socially, students encounter increased course rigor, decreased in-class time, and adjustment to new social groups (Kadison & DiGeronimo, 2004). Additionally, student-athletes encounter scrutiny from the public, extensive time commitments, and physical and mental demands as they combine athletic and academic pursuits (Carodine Almond, & Gratto, 2001). For first year student-athletes, resilience emerges as a psychological quality that can greatly benefit student-athlete development. Strengths-based programming can aid in student-athletes creating a more holistic student-athlete experience linked to increased self-esteem (Martin, 1999), quality of life (Groff, Lundberg, & Zabriskie, 2009), and athlete satisfaction (Burns, Jasinski, Dunn, & Fletcher, 2012). This project presents the development and evaluation of a resilience-based educational program for student-athletes transitioning into college. The program was implemented at two NCAA Division I universities (in-person at Boise State and online at Illinois State), including four workshops focused on developing a healthy student-athlete identity, stress management and coping skills, social networks, and a leadership mindset. In total, 135 student-athletes (Boise State = 62; Illinois State = 73) completed the program, and along with 56 participants in a control group, completed assessments at three time points (T1 = pre-program, T2 = post-program, T3 = follow-up). Results revealed that student-athletes had relatively low levels of stress and distress and high levels of resilience, athletic identity, and satisfaction with life. In relation to the control group, athletes scored lower than the control group on the markers of negative mental health (stress and distress) and higher on resilience. In terms of satisfaction with life, athletes scored lower than the control group in Time 1 and Time 2, but then increased markedly and showed higher satisfaction with life than the control group at Time 3. Overall, student-athletes evaluated the program very positively with most participants believing the program was beneficial and recommending that future student-athletes participate in the resilience program. The presentation will highlight unique conclusions about student-athlete resilience and psychological development and share implications and recommendations for student-athlete educational programming and support.

ON-DEMAND SCREENING OF AGROCHEMICALS AND PRIORITY POLLUTANTS IN SOIL USING FILTER CONE SPRAY IONIZATION - MASS SPECTROMETRY (FCSI-MS)

Presenter	Overfelt, Makoy Undergraduate, Chemistry
Mentor	Prof. Christopher Mulligan
Authors	Makoy Overfelt; Shahnaz Mukhta; Alyssa Gasa; Christopher Mulligan

The contamination of soil with hazardous materials such as agricultural chemicals (e.g. pesticides) and persistent organic pollutants (PCBs, etc.) poses alarming health risks to people and wildlife on a global scale. Each year, potentially harmful substances like systemic neonicotinoid pesticides and dangerous byproducts of industrial facilities are emitted into surrounding soil. These substances need to be monitored in order to ameliorate intentional or accidental contamination, but also their accumulation and fate under environmental conditions. In this work, a newly reported ionization technique, filter cone spray ionization (FCSI), was implemented towards direct, on-demand analysis of soil matrices to examine its screening efficacy. MS systems employed for this work included a lab-scale ion trap MS (Thermo LCQ Fleet) and ruggedized, portable ion trap MS (FLIR Systems AI-MS 1.2 CIT-MS), coupled with a home-built FCSI ionization source. FCSI-MS allows direct profiling of analyte residues from complex matrices by employing on-board filtration and ESI-like ionization mechanism. Soil standards of varying compositions (Sigma) were spiked with target analytes and exposed to variable, yet controlled environmental conditions (such as moisture, temperature, etc.). Sub-samples of soil samples were then analyzed directly via FCSI-MS, utilizing common spray solvent systems and high voltage (4.5 kV) delivered via a clamping electrode.

MACHINE LEARNING USING PYTHON

Presenter

Peri, Rekha

Graduate, Information Technology

Mentor

Prof. Jihad Qaddour

Machine Learning (ML) and Artificial Intelligence (AI), or machine intelligence, are the field developing computers capable of parsing data contextually to provide requested information, supply analysis, or trigger events based on findings. Through techniques like AI, ML, and Neural Networks, companies globally are investing in teaching machines to 'think' more like humans. This project uses the integration of those techniques on data collected for housing prices of selected place to predict the selling price of available home. To predict the new housing price first we need to explore the data to know the required features and statistics about the dataset. Next step is to split the dataset into test and training subsets (20/80) and determine a suitable performance metric for the problem. Then the data will be analyzed using performance graphs for a learning algorithm with varying parameters and training set sizes. This enables the realtor to pick the best model suitable as per the customer needs. Once we get a good fit, we will use this model to predict the monetary value of a house located at any place. A model like this very valuable for a real estate agent who could make the information provided in a daily basis. Apart from real estate agents, the project is also useful for anyone who in the market to either buy, sell or build a house, which could be potential homeowners selling their houses, home buyers, and construction companies.

The benefit of this study is that we can a client who wants to buy their dream home with a reasonable price tag. They have their location of interest ready. Now, they want to know if the house price matches the house value. With this study, they can understand which features (number of bedrooms, number of bathrooms, and location, etc.) influence the final price of the house. If all matches, they can ensure that they are getting a fair price.

Another scenario could be, the client wants to take the advantage of features that influence a house price the most. They typically want to buy a house at a low price and invest on the features that will give the highest return. The client will invest on making rooms at a small cost to get a large return.

LEARNING WITH BENEFITS: INTERNATIONAL STUDENTS' ACCOUNT OF HEALTH-RELATED RESOURCES ON CAMPUS

Presenter	Pham, Tyler Graduate, Communication
Mentor	Prof. John Baldwin
Authors	Tyler Pham; Vanessa Le

The study examines the utilization and the quality of on-campus health services under the perceptions of international students. The researchers carried out in-depth interviews with seven international students at a Mid-western university in the United States. The interviews were fully audio recorded and transcribed. Recordings were put under a serious process of coding and analyzing to ultimately group the important information into five main themes. These include (1) types of on-campus health resources that students are aware of, (2) immunization, (3) financial concerns, (4) experience with healthcare professionals, and (5) utilization of technology. The research fills in the gap of previous studies by focusing on asking questions about both physical and mental health services available on campus for international students. Suggestions for future research are also included.

METABOLIC SYNDROME AND MUSCULAR STRENGTH IN YOUTH: NHANES 2011-2014

Presenter	Pilli, Nicholas Graduate, Kinesiology & Recreation
Mentor	Prof. Kelly Laurson
Authors	Nicholas Pilli; Tyler Kybartas; Kristen Lagally; Kelly Laurson

Muscular strength has recently been identified as a potential target of cardiometabolic risk-factor reduction strategies in youth. Initial explorations have indicated links between muscular strength and individual components of metabolic syndrome, but large, nationally-representative research on the topic is limited. **PURPOSE:** To investigate the relationship between metabolic syndrome and muscular strength in a nationally representative sample of U.S. youth. **METHODS:** The analysis included 409 boys and 415 girls from the 2011-2014 National Health and Nutrition Examination Survey between 12-18 years of age. Metabolic syndrome was defined by the Jolliffe and Janssen criteria and based on having 3 or more of the following components: abdominal obesity, high triglycerides, low HDL cholesterol, elevated blood pressure, or high fasting glucose. Muscular strength was assessed via handgrip dynamometer and expressed as age- and sex-specific z-scores of relative strength (kg strength/kg body mass). Low strength was defined as a relative grip strength below the 25th age- and sex-specific percentile. Logistic regression was used to estimate the odds of metabolic syndrome based on relative strength z-score. An additional model compared the odds of metabolic syndrome between youth in low and adequate strength groups. All analyses controlled for age, sex, race/ethnicity, physical activity status, and weight status. **RESULTS:** The prevalence of metabolic syndrome was 5.3% (95% CI 3.9% to 7.3%). The logistic regression indicated that for every 1 unit decrease in strength z-score, the odds of metabolic syndrome increased by 2.6 (95% CI 1.7 to 4.1). Further, adolescents with low strength were more likely to have metabolic syndrome than those with adequate strength (odds ratio = 2.2, 95% CI 1.1 to 4.3). **CONCLUSIONS:** Muscular strength is predictive of adolescent metabolic syndrome. Youth with low strength are more than twice as likely to have metabolic syndrome than those above the bottom strength quartile, irrespective of physical activity and weight status. These results highlight the relevance of muscular strength in the prevention of youth cardiometabolic disease and metabolic syndrome.

COMPLEMENTARY AND ALTERNATIVE MEDICINE FOR ONCOLOGY PATIENTS

Presenter	Prabhu, Reena Undergraduate, Nursing
Mentor	Prof. Megan Rappleyea

Complementary and alternative medicine (CAM) has been used on multiple different populations for a variety of different illnesses and disabilities. One of the main purposes for integrating CAM with treatment plans include its benefits on quality of life (QoL). Increasing a patient's QoL entails improvements in their physical, social, emotional, and spiritual life. A patient population that could potentially benefit from CAM are oncology patients. The majority of cancer patients report to suffer from uncontrolled pain and the fear of dying. The physical and emotional stress associated with cancer pains can drastically decrease a patient's quality of life. While cancer treatment mainly focuses on increasing the patient's rate of survival, it often fails to address the patient's well-being and QoL. This review will address how the use of complementary and alternative therapies can potentially improve a the QoL among oncology patients.

Keywords: complementary and alternative therapy, cancer pain, oncology patients, opioids, quality of life

PICO Question: In adult oncology patients experiencing cancer pain and treatment side effects, how does the integration of complementary and alternative medicine (CAM) compared to conventional medicine alone affect the patient's quality of life.

Purpose: To determine the benefits and risks of using CAM on oncology patients for symptom relief. In addition, to evaluate the gaps in research and education on the use of CAM in health care.

Search Strategies: Databases included in the search were Cochran, CINAHL, and PubMed. Initially, 20 articles were reviewed. Thirteen articles were included in the literature review with limitations on articles that assessed the effectiveness of CAM, integration into health care, and the opioid crisis.

A PROGRAM EVALUATION OF FIRST STAR ACADEMY AT THE ISU SCHOOL OF SOCIAL WORK

Presenter	Prince, Verneice Graduate, Social Work
Mentor	Prof. Kate Sheridan

This study explored existing data in the form of pre- and post tests completed by students attending First Star Academy at the School of Social Work at ISU. First Star Academy is a program that helps high school students who are also wards of the State of Illinois to prepare for college and includes on-campus Saturday programming and an intensive multi-week on-campus summer program. The pre- and post tests explored participant's knowledge of life skills needed for success in college. Findings will inform an understanding of the extent to which First Star Academy programming helps to prepare First Star scholars for success.

EVALUATING MIKE & PIKE: THE RELATIONSHIP TREND BETWEEN ELEPHANT CARCASSES & THE ILLEGAL TRADE IN ENDANGERED ELEPHANTS

Presenter	Privett, Jacqueline Undergraduate, Biological Sciences
Mentor	Prof. Jacqueline Schneider
Author	Jacqueline Privett; Jacqueline Schneider

African and Asian elephants face many threats to their population numbers, including habitat loss, climate change, and interactions with humans. However, poaching and the illegal wildlife trade are the largest threats to these species. The first step in the illegal trade is taking or poaching of the elephant - typically the bulls with the largest tusks. Tusk ivory, whether African or Asian, is then exported to transit hubs in Asian countries. Final exported products, either carved or raw, enter the illegal markets located in many Asian countries and cities. Monitoring the Illegal Killing of Elephants (MIKE) and Proportion of Illegally Killed Elephants (PIKE) calculated that more elephant carcasses were found in 2011 than any other year, which resulted in more shipments of ivory leaving Africa and the price of ivory tripling in China. MIKE and PIKE data are analyzed in order to evaluate the crime of elephant poaching and its role in the illegal trade in endangered species.

DO DEMOGRAPHIC CHARACTERISTICS MODERATE THE ASSOCIATION BETWEEN LONELINESS AND DISTRESS?

Presenter	Quast, Jessica Undergraduate, Psychology
Mentor	Prof. Jeremy Kanter, Family and Consumer Sciences
Co-Mentors	Profs. Daniel Lannin, Psychology and Luke Russell, Family and Consumer Sciences
Authors	Jessica Quast; Meredith Spraggon; Jeremy Kanter; Daniel Lannin; Luke Russell; Ani Yazedjian

Problem or Major Purpose: The present study examines associations among loneliness, psychological distress, age, and gender. Loneliness—feelings of sadness and perceptions of social isolation—are associated with greater psychological distress (e.g., Mahon et al., 2006), and may be influenced by gender and developmental stage. With a greater sense of who they are, youth in later adolescence may increasingly need to decide whether to remain alone or be with others (Craig-Bray, Adams, & Dobson, 1987; Erikson, 1963). Indeed, feelings of loneliness are theorized to peak during adolescence (Qualter et al., 2015) when developing and maintaining meaningful social networks is increasingly more salient (Berndt, 2002). When social networks are underdeveloped, loneliness and psychological distress may pose greater risks for older adolescents (Prinstein & Le Greca, 2002). The consequences of loneliness may also be stronger for females, as they tend to experience more rumination than males (Twenge & Nolen-Hocksema, 2002). Therefore, in the current study, we hypothesized that both age and gender would moderate the association between loneliness and distress in a sample of adolescents.

INCOME ELASTICITY OF POVERTY: RECENT ESTIMATES FOR SOUTH ASIAN COUNTRIES

Presenter	Rahman, Md Zahidur Graduate, Economics
Mentor	Prof. Rati Ram

Measuring the magnitude of the effect of economic growth on poverty rate is relevant both for academic and policy purposes. This paper estimates the income elasticity of poverty in six South Asian countries where world's majority of the poor people live for the most recent period since 2005 to 2015. Based on the findings, five notable points can be identified. First, there has been substantial improvement in poverty situation during the period reflected by high rates of decline in \$1.90 poverty rate. Second, compared to 1990-2005 period, observed effect of growth on poverty reduction during the last decade has increased across all the countries under the study by a factor of three and higher. Third, income elasticity of poverty declines substantially as the cut-off point of poverty measure is increased from \$1.90 to \$3.20 and \$5.50 poverty line. Third, huge variability is observed in elasticity estimates and the pattern of variation is almost similar to what is reported by Ram (2015). Fifth, this implies that cross-country factors other than income might explain a larger part of the reduction of poverty for the South Asian countries.

A FORMATIVE EVALUATION OF MTSS IN A MIDWESTERN ELEMENTARY SCHOOL

Presenter	Remijas, Krystal Graduate, Psychology
Mentor	Prof. Mark Swerdlik
Authors	Krystal Remijas; Mark Swerdlik

A program evaluation was conducted of the implementation of MTSS at a midwestern elementary school. Assessment data included an online parent and staff survey and an analysis of student outcome data. The focus was on parent and staff perceptions and analysis of student outcome data related to intervention effectiveness.

ACCURACY OF REPETITIONS IN RESERVE RATINGS ACROSS MULTIPLE SETS OF SINGLE- AND MULTI-JOINT RESISTANCE TRAINING

Presenter	Remmert, Jacob Undergraduate, Kinesiology & Recreation
Mentor	Prof. Kelly Laurson
Authors	Michael Zourdos; Kelly Laurson

The number of repetitions which can be performed at a given intensity during resistance training is highly individual. Therefore, percentage-based loading such as 4 sets of 8 repetitions at 70% of one-repetition maximum (1RM) could provide a different inter-individual stimulus. Alternatively, the repetitions in reserve (RIR) scale can be used for load prescription. For example, if an athlete were to perform a biceps curl for 8 repetitions and rate 2RIR following that set, that indicates the athlete believes a total of 10 repetitions could be completed. Therefore, RIR-based prescription could be used; such as 4 sets of 8 repetitions with a load between 2-4RIR. Despite the promise of RIR, its utility depends upon the accuracy of the rating. Data exists examining the accuracy of RIR ratings on multi-joint movements, however there is no comparable data on single-joint movements to date. PURPOSE: The purpose of this study is to investigate the accuracy of intraset RIR ratings in experienced and novice lifters on both single- and multi-joint exercises. METHODS: Sixty healthy adult subjects (men, n=30 and women, n=30) will be recruited. Following completion of an informed consent and a training history questionnaire, participants will warm-up and have their 5RM assessed on the biceps curl, triceps pushdown, and seated cable row in randomized order. After the 5RM test, a 1RM will be estimated from a standardized equation, then participants will complete 4 sets to failure at 72.5% of the estimated 1RM. During all sets to failure, subjects will verbally indicate when they perceive themselves to have 5RIR, then verbally indicate their perceived RIR after every repetition thereafter until muscular failure is reached. ANTICIPATED RESULTS: We hypothesize that subjects will be able to predict RIR within ± 3 repetitions and that a positive relationship between RIR accuracy and training experience (i.e. improved accuracy with more training experience) will exist. We expect RIR ratings to be more accurate: 1) when RIR is predicted closer to muscular failure, 2) when there are fewer repetitions performed in a set, 3) in single- versus multi-joint exercises, 4) in men compared to women. POTENTIAL CONCLUSIONS/APPLICATION: If RIR ratings are accurate; then, RIR-based load prescription could be used to standardize effort between individuals, rectifying the limitation of the inter-individual repetition performance present with percentage-based loading. Further, RIR could be used to autoregulate training load (i.e. increase or decrease) to account for daily fluctuations in performance.

SEXUAL CONFLICT IN CRICKETS: DO ACCESSORY GLAND PROTEINS MANIPULATE FEMALE BEHAVIOR AND PHYSIOLOGY AFTER MATING?

Presenter	Rines, Ian Graduate, Biological Sciences
Mentor	Prof. Ben Sadd
Co-Mentor	Prof. Scott Sakaluk
Authors	Ian Rines; Ben Sadd; Scott Sakaluk

Although sexual reproduction is inherently cooperative, it is frequently beset with conflicts of interests between the sexes. The provision of nuptial food gifts by males, an integral reproductive strategy of many insects, may influence female behavior and physiology against females' own reproductive interests. In decorated crickets, *Gryllobates sigillatus*, the spermatophore transferred by the male at mating includes a large gelatinous mass, the spermatophylax, which is a food gift consumed by the female after mating. The spermatophylax deters the female from prematurely terminating sperm transfer and may be a route through which the male further manipulates females to their own fitness benefit. A recent proteomic analysis of the spermatophylax has revealed a suite of accessory gland proteins, including ones with potential roles in physiological manipulation of the female or protection from digestion of other active components transferred by the male. I hypothesize that, in addition to enhancing the gustatory appeal of the spermatophylax, accessory gland proteins function to diminish the future sexual receptivity of females to benefit the provisioning male. I investigated whether accessory gland proteins introduced en masse influence female remating behavior and egg-laying. I injected unmated and mated females with accessory gland proteins (or muscle protein or saline as controls) and observed their remating behavior. I found that mated females took longer to remate regardless of the injection they received. This result reveals that mating can alter female reproductive behavior, highlighting the potential for males to manipulate females to further their own reproductive interests. The mechanism underlying the female behavioral change has not been established, but my future work aims to take a novel approach to deconstruct the molecular underpinnings of behavioral and physiological manipulation of females, which lies at the heart of sexual conflict.

SEX-SPECIFIC EFFECTS OF HATCHING ORDER AND SYNCHRONY ON NESTLING BASELINE CORTICOSTERONE LEVELS

Presenter	Rittinger, Madison
	Graduate, Biological Sciences
Mentor	Prof. Scott Sakaluk
Co-Mentor	Prof. Charles Thompson
Authors	Madison Rittinger; Charles Thompson; Scott Sakaluk

Female songbirds hatch their eggs synchronously (within 24 hours) or asynchronously (over 2-3 days) by altering the onset of incubation. In our study population of house wrens (*Troglodytes aedon*), we have shown that these different hatching patterns have sex-specific size- and condition- effects on nestlings, and that females allocate the sex of their offspring across the laying order to capitalize on these effects. We hypothesized that levels of circulating corticosterone in nestlings, the primary metabolic hormone in birds, mediate these sex-specific effects, and predicted that corticosterone levels in (i) first-hatched males in asynchronous broods would be highest, (ii) last-hatched males in asynchronous broods lowest, and (iii) females in asynchronous broods and all nestlings in synchronous broods intermediate. We also experimentally created asynchronous broods by reciprocally cross-fostering nestlings at different stages of development, creating broods with one nestling significantly advanced or delayed in development compared with its nestmates. This design created comparisons of (i) first- and last-hatched nestlings with the same mother, but different rearing environments and (ii) first- and last-hatched nestlings with different mothers, but the same rearing environment. In both comparisons, we predicted that first-hatched nestlings would have higher baseline corticosterone levels than their brood mates, whereas last-hatched nestlings would have lower levels, but that the extent of these differences would be contingent on the sex of the nestling. Blood samples taken to determine the sex of young and to measure baseline corticosterone levels of nestlings are currently being analyzed.

WORKING WITH TURTLE IMMUNE CELLS AND ANTIBODIES IN THE LAB: DETERMINING EXPERIMENTAL CONDITIONS

Presenter	Ryan, Micaela Undergraduate, Biological Sciences
Mentor	Prof. Laura Vogel
Co-Mentor	Prof. Rachel Bowden
Authors	Beto Araiza; Paige Farchmin; Ceara Abbott; Rachel Bowden; Laura Vogel

While much is known about the human immune system, we don't know much about reptilian immune responses. Turtles have long life spans and certainly their immune system contributes to their longevity. Our lab is interested in how turtle immunity works, so we performed experiments to test how turtle white blood cells reacted in common immune assays. First, we investigated flow cytometry and sorting in order to analyze and separate B cells. However, we found the turtle B cells appeared to die in the process, while non-B cells survived. Next, we tested two common salt solutions to see if they affected cell viability. Balanced Salt Solution is commonly used for mouse cells while Ringer's used for amphibians. We hypothesized our reptile cells would thrive better in Ringer's solution, and our hypothesis was supported. Next, we tested the B cells in a functional assay to see if they could carry out the process of phagocytosis. We incubated the cells with small fluorescent beads and used flow cytometry to determine if the cells had captured any beads. Lastly, we tested the Protein G column method, a common mouse antibody purification technique, to purify antibodies from turtle serum. Our results indicated that turtle Ig did not bind to the column. Overall, our study suggests common mouse immunology methods may need to be modified for turtle cells. This work was supported by a University Research Grant (FRA) to LA Vogel, a National Science Foundation grant Grant/Award Number 1725199 to LA Vogel and RM Bowden, and a National Institutes of Health Award 1R15AI140118 - 01 to LA Vogel and RM Bowden.

THE ASSOCIATION OF RATE OF PERCEIVED EXERTION ON VESTIBULAR/OCULAR MOTOR SCREENING

Presenter	Salanga, Katherine Graduate, Kinesiology & Recreation
Mentor	Prof. Nicole Hoffman
Authors	Katherine Salanga; Nicole Hoffman

Sport related concussion (SRC) is a rapidly growing topic worldwide. Commonly reported symptoms of SRC are fatigue and vestibular-ocular motor disturbances, but there is limited research examining this relationship. Current sideline SRC diagnostic tools do not have a strong sensitivity and specificity and do not incorporate vestibular-ocular motor testing immediately following concussion despite the prevalence of acute visual disturbances. Furthermore, evidence is minimal on vestibular-ocular motor functioning following immediate removal from activity in healthy individuals. Purpose: To determine the association of vestibular-ocular motor functioning and fatigue in healthy collegiate athletes across 2 time points (pre-practice and within 5 minutes of removal from practice). Methods: A total of 50 healthy collegiate athletes (male=X, female=X) between the ages of 18-23 completed a demographic and medical history questionnaire. A baseline Vestibular/Ocular Motor Screen (VOMS; smooth pursuit, saccades, vestibular ocular reflex, visual motion sensitivity, and near point convergence) and Borg Rating of Perceived Exertion (RPE) scale were administered prior to practice. VOMS and RPE scale measures were then administered again within 5 minutes of removal from practice. Results: To be determined; data collection is currently in progress. Conclusion: By understanding vestibular-ocular motor functioning and perceived exertion in healthy athletes, clinicians may be able to utilize findings to provide support for screening for visual disturbances immediately following concussion.

HOW CAN NARRATIVE EMPATHY BE DEVELOPED INTO COMPASSIONATE ACTION?

Presenter	Sanford, Heather
	Graduate, English
Mentor	Prof. Daniel Breyer

This study explores possible intersections between narrative empathy and loving-kindness meditations. The goal of this exercise is to explore whether evoking narrative empathy while reading a story, framed by guided reflections on the experience, can help to build the same compassionate reflexes that are associated with loving-kindness meditations. Additionally, this study is interested in exploring whether engaging with different kinds of texts can evoke different results or reactions. Texts of varying length will be used, as well as a variety of fiction/non-fiction and visual/textual texts. This research will be presented through the findings of a case study, in which the researcher constructs and participates in a series of exercises for several days that are structured to use story reading as a means of evoking narrative empathy.

The researcher is interested in looking at possible intersections between narrative empathy and loving-kindness meditations. The goal of this exercise is to explore whether evoking narrative empathy while reading a story, framed by guided reflections on the experience, can help to build the same compassionate reflexes that are associated with loving-kindness meditations. To do this, the researcher will read the picture book *Zen Shorts* by Jon J. Muth, selections from the short story anthology *Flying Lessons & Other Stories* edited by Ellen Oh, and the graphic memoir *Fun Home* by Alison Bechdel. The researcher will collect qualitative data in the form of written reflections throughout the study. She will also periodically take a "Connection to Humanity" quiz developed by the Greater Good Science Center at The University of California, Berkeley.

The findings will suggest that participating in this exercise regularly over period of one week can help an individual articulate their own conceptualizations of empathy. The findings will also demonstrate reactions to the texts that are surprising in light of previous research that has been done on graphic memoir and narrative empathy. However, the researcher-participant's "Connection to Humanity" quiz scores can also be seen to increase steadily the longer the study goes on, which suggests that engaging with these narrative empathy reflective exercises do in fact hold the potential to develop overall compassion.

SEX AND HEIGHT DIFFERENCES ASSOCIATED WITH HIGH IMPACT PHYSICAL ACTIVITIES IN CHILDREN

Presenter	Santillan, Carlos Graduate, Kinesiology & Recreation
Mentor	Prof. Adam Jagodinsky
Authors	Adam Jagodinsky; David Thomas; Skip Williams

INTRODUCTION: During childhood mechanical loading is important for developing a resilient skeleton. High impact activity interventions cause improvements in bone mineral density in youth and can promote long term bone health. When designing interventions, it is important to know if sex and height play a role in loading magnitudes experienced during various jumping activities. **PURPOSE:** Examine if sex and height impact the magnitude of peak ground reaction forces (pGRF) during different jump tasks. **METHODS:** Four males (Age: 9 ± 1 years; Height: $1.36 \pm .11$ m; Mass: 31 ± 5 kg) and four females (Age: 11 ± 1 years; Height: $1.46\pm .05$ m; Mass: 36 ± 6 kg) performed five trials for each jump condition. Each subject performed a broad jump (BJ), countermovement jump (CMJ), jumping jack (JJ), leap jump (LJ), and a drop jump (DJ). Data were collected on a force plate (1000 Hz), and pGRF in units of body weight (BW) was determined during the landing phase. A mixed ANOVA was employed to assess sex differences across conditions. Correlation analysis assessed the relationship between height and pGRF for each condition. **RESULTS:** No differences in pGRF were observed between males (m) and females (f) across conditions [BJ (m: 2.14 ± 0.09 , f: 2.33 ± 0.18 BW), CMJ (m: 2.42 ± 0.2 , f: 2.44 ± 0.25 BW), JJ (m: 2.55 ± 0.16 , f: 2.53 ± 0.25 BW), LJ (m: 1.98 ± 0.02 , f: 2.02 ± 0.15 BW), and DJ (m: 2.88 ± 0.31 , f: 3.25 ± 0.48 BW)]. There was a moderate correlation between height and pGRF for DJ ($r = 0.59$). **CONCLUSION:** Larger pGRF exhibited with taller subjects during the DJ condition can be explained by considering a higher center of mass contains more gravitational potential energy converted to kinetic energy during the DJ, and thus requires a larger pGRF to slow the participant's center of mass during landing. Height differences should be considered when designing interventions involving drop jumps to elicit bone adaptations in youth.

INVESTIGATING CLIENT SENTIMENTS TOWARD TRANS CLIENTS IN RESIDENTIAL TREATMENT SETTINGS

Presenter	Schaefer, Jordan Graduate, Social Work
Mentor	Prof. Kate Sheridan

The research topic is looking to use a vignette model to interview adult men and women seeking residential treatment for substance use disorder. The vignette seeks to explore participant perceptions of transgender clients in residential treatment settings. The vignette will give a brief description of a hypothetical client in a residential treatment program. There will be four vignettes, 2 of which will be provided to participants who identify as female, and 2 that will be provided to individuals who identify as male. The only difference in these vignettes will be the gender of the hypothetical client (e.g., one of the 2 vignettes provided to participants who identify as female will contain a description of a hypothetical client who is cis-gendered female and the second vignette will contain a description of a hypothetical client who is trans-gendered female; one of the 2 vignettes provided to participants who identify as male will contain a description of a hypothetical client who is cis-gendered male and the second vignette will contain a description of a hypothetical client who is trans-gendered male). Each participant will receive one vignette. Post vignettes questions will evaluate areas such as self-perceived comfort with a client in treatment and residential setting, ability to relate to the client, perception of the client's success in treatment, and more.

THE OPTIMAL TREATMENT TIME OF DRY CUPPING THERAPY TO INDUCE CHANGES IN LOCAL BLOOD FLOW AT THE UPPER TRAPEZIUS

Presenter	Schultz, Emily Graduate, Kinesiology & Recreation
Mentor	Prof. Noelle Selkow
Co-Mentor	Prof. Nikki Hoffman
Authors	Emily Schultz; Noelle Selkow; Nikki Hoffman

Context: Musculoskeletal neck and shoulder pain is a prevalent condition across the world with nearly two-thirds of the population experiencing musculoskeletal neck pain sometime in their lifespan. The treatment for musculoskeletal pain conditions varies, but recent focus is on complementary and alternative medicine, such as cupping therapy. Cupping therapy is an ancient treatment method that involves the use of a cup to produce sub-atmospheric pressure on the skin. There is much speculation around its true effects and mechanisms on the human body; theories have been proposed that cupping therapy has an effect on local blood flow, inflammation, and pain. Additionally, there has not been a pre-defined parameter of time for the treatment of musculoskeletal pain conditions.

Objective: To determine the optimal treatment time for dry cupping therapy at the upper trapezius muscle to induce changes in local blood flow.

Design: Single-blinded, randomized crossover study

Setting: Athletic Training Laboratory

Participants: 30 participants were recruited for this study. Volunteers were included if they were healthy individuals with non-specific neck pain. Volunteers were excluded if they had cupping therapy or any treatment performed within the past 3 months to the neck or shoulder area, history of head, neck, or shoulder injury within the past 6 months resulting in medical care, known blood clotting disorder, allergy to lubricant, hypertension, diabetes, cancer, pregnancy, cardiac failure, renal failure, allergic purpura, hernia, psoriasis, eczema, rosacea, varicose veins, phlebitis, hepatocirrhosis, allergic dermatitis, sunburn, open wound, fever, or were taking anticoagulants.

Interventions: Dry cupping therapy for 5, 7 ½, and 10 minutes in a randomized order repeated once per week. One stationary cup was placed directly over the midpoint of the upper trapezius muscle for each participant. The treatment area was defined by palpating the posterior neck musculature on the patient's dominant side until the midpoint of upper trapezius was met.

Outcome Measures: Subcutaneous hemodynamics including superficial and deep oxygenated, deoxygenated, and total hemoglobin levels were collected and exported for data analyses using the NIRS Portamon.

Hypotheses: Subcutaneous and deep hemoglobin levels will have the greatest increase following 10 minutes of dry cupping therapy as compared to the 5 and 7 ½ minutes treatments.

CONTRIBUTIONS OF PUBLIC AND PRIVATE INVESTMENT IN THE ECONOMIC GROWTH: A CROSS-SECTIONAL INVESTIGATION USING OECD DATA

Presenter	Shahrezaei, Shabnam Graduate, Economics
Mentor	Prof. Hassan Mohammadi
Authors	Shabnam Shahrezaei; Hassan Mohammadi

This paper examines the relative contribution of public and private investment to per capita GDP growth in 36 OECD countries. It extends the basic neoclassical model of growth by separating investment into its public and private components following Khan and Kumar (1997) and estimates this model for a sample of 36 OECD countries using single equation estimation techniques for four time periods: 1980-1989, 1990-1999, 2000-2009, 2010-2017. This empirical analysis provides a framework to test several interesting hypotheses: (1) Does private investment have a larger impact on growth than public investment, and is the differential impact statistically significant? (2) Does public investment expenditure substitute or complement private investment in the economic growth process? (3) Does evidence support convergence in per capita real income across the 36 OECD countries? The findings from this study are relevant from a theoretical, empirical, and policy point of view. All data are derived from IMF's World Economic Outlook (WEO) database, World Bank's World Development Indicators and OECD National Accounts.

USING MACHINE LEARNING & DATA SCIENCE TO FIGHT CYBER CRIME

Presenter

Shalini, Amrita

Graduate, Information Technology

Mentor

Prof. James Wolf

In the modern world the technology is rising quite rapidly. In order to operate our industries, government, national defense and other vital functions, society is becoming more dependent on data and networks. Nearly every person with computer knowledge has entered into the use of this fast-growing industry. Cyber crime is a criminal act committed via internet and technology. Most cyber crime is an attack on personal, corporate, or government information. Though the attacks do not occur on a physical body, they do occur on the virtual personal or corporate body, which is the set of information attributes that define people and institutions on the Internet. Today, cyber crime has drawn a great deal of attention around the globe because of the recorded dramatic increase rate of case reported. As a matter of fact, a new form of cyber crime case is being recorded every single day. In reality, cyber crime is the most brutal computer crime in the modern world that has caused a great deal of many people to lose their most confidential information. In other words, our virtual identities are essential elements in the digital age Machine learning & Data Science is one of the defense mechanisms to protect our virtual identities. This not only helps to react to cyber crimes by enhancing the cyber protection systems but also is instrumental in formulating defense strategies proactively by predictive analysis.

ENANTIOMERICALLY PURE TERT-BUTYLSULFINAMIDE AS A TEMPLATE FOR SYNTHESIZING SULFINATE ESTERS AND SULFINAMIDES NOT ACCESSIBLE THROUGH DIRECT ALKYLATION

Presenter

Shaw, Jessica

Graduate, Chemistry

Mentor

Prof. Shawn Hitchcock

Authors

Jessica Shaw; Shawn Hitchcock

This research is focused on the synthesis of chiral, non-racemic sulfinamides as organocatalysts for asymmetric reduction of imines and aldehydes. We seek to use tert-butylsulfonamide as a commercially available starting material that can be used to synthesize sulfinamides that would not be directly accessible through the alkylation or arylation of tert-butyl-sulfonamide. The first attempt at using (R)-tert-butylsulfonamide involved converting the amino group to a suitable leaving group via N-nitrosation using sodium nitrite combined with 3M hydrochloric acid. No product was observed under these conditions. It is proposed that the intermediate reacts too rapidly through a degradative mechanism that is independent of the presence of any nucleophile. In order to improve the reaction conditions to allow for the trapping of nucleophiles, tert-butyl nitrite was employed as the nitrosating agent. Using this reagent in combination with p-nitrobenzyl alcohol, the p-nitrobenzyl sulfinate ester was observed. This poster will feature the optimization of this transformation for the formation of enantiomerically enriched sulfinate esters via the tert-butyl nitrosation pathway.

DOING GOOD? THE IMPACT OF SHORT-TERM SERVICE TRIPS ON LOCAL COMMUNITIES

Presenter	Shaw, Kendra Graduate, Politics and Government
Mentor	Prof. Mike Hendricks

Every year, thousands of individuals conduct fundraisers, gather supplies, and practice their photography skills in preparation for short-term volunteer trips to developing countries. In fact, in the United States alone, nearly one million people volunteer abroad, and more than 500 groups organize and lead over 6,000 short-term trips each year. The trips last between 5 to 90 days and cost the volunteers at least \$1,000. The volunteers nobly aim to help others in need and to make a difference while receiving little or no compensation in return. Essentially, they claim tangible improvements of local communities for the "betterment of the world" or "alleviation of poverty."

After a week or two abroad, the volunteers return home full of stories, experiences, and a new passion for doing good in the world. The changes in perspectives of the individuals who participate are undeniable. Scholars even argue that short-term trips help increase volunteers' cultural competency, improve career aspirations, and encourage civic engagement. However, little is known about the impact that the trips have on the communities they are claiming to help. Considering the sheer number of volunteers and money spent on the trips, as well as this gap in literature, this study asks the following question: Do short-term volunteer trips impact local communities in developing countries positively or negatively?

To answer this question, this study proposes a more holistic approach by shifting the focus away from volunteers and organizations to local communities, as well as a more detailed approach by sorting short-term volunteering into three categories. The three types of short-term trips include: the delivery of goods and services, project-based, and human development. For each type, an example is included, followed by a discussion on its potential positives and negatives.

After comparing the three, volunteer trips dedicated to human development seem to more positively impact, or at least minimally damage, a local community. However, additional factors, such as the number of participants, frequency of the trips, and the presence of local partnerships, should be considered. Overall, this study is not meant to criticize specific organizations, nor does it advocate for the termination of all short-term volunteering. It simply aims to initiate the identification of best practices, which can serve as a guideline for future short-term service trips.

USING RECYCLED GLASS IN ALKALI-ACTIVATED MATERIALS

Presenter	Simmons, Nolan Undergraduate, Health Sciences
Mentor	Prof. Guang Jin
Co-Mentor	Prof. Tom Bierma
Authors	Nolan Simmons; Tom Bierma; Guang Jin; Nolan Simmons

Portland cement-based products, primarily concretes, are the world's most commonly used building materials. However, Portland cement production is characterized by high energy demands, consumption of non-renewable prime materials and the emission of greenhouse gases. Alkali-activated materials (AAMs) constitute a possible alternative to Portland cement due to lower energy demands, lower polluting gas emissions and the absence of durability-related technical problems. AAMs is prepared by an alkaline activator and industrial by products such as slag, fly ash and silica fume. The purpose of this study is to examine the use of recycled glass in AAMs production through forming sodium silicate hydrate (waterglass) - a common alkali activator.

A series of bench-scale glass dissolution reactions were performed using sodium hydroxide solutions with commercially cleaned and characterized recycled glass. Reactions were performed at 80oC and continuously stirred where all glass particles are suspended. Concentration of dissolved silicon were monitored for every 48 hours for 3 weeks and analyzed using ICP (Inductively Coupled Plasma). Impact of glass particle size and concentration of sodium hydroxide were examined. Highest dissolved silicon concentration was found to be at 70,000 ppm with the finest glass particle size of around 70 μm using 1M sodium hydroxide.

DALEA PURPUREA IN TALLGRASS AND HILL PRAIRIES: FLORAL TRAITS AND HABITAT SIZE INFLUENCE BEE POLLINATOR DIVERSITY

Presenter	Smith, Jesse Graduate, Biological Sciences
Mentor	Prof. Diane Byers
Authors	Jesse Smith; Diane Byers

Historically 60% prairie, Illinois has now lost 99% of this habitat to agriculture. These remaining areas are referred to as remnants. To preserve these often small patches of native prairie, we need to better understand interactions between the above- and below-ground communities. Soil microbes may interact with plants to alter the size of flower displays, and thus indirectly affect pollinators of the plant. Bees are key for plant reproduction for many prairie plants, and globally, many bee species are in decline. In North America, there are approximately 4,000 species of bees, of which, approximately 400 can be found in Illinois. Through sampling and behavioral observations, I compare differences between tallgrass and hill prairies that abiotic factors and biotic characteristics of the soil affect the plants' ability to grow and the pollinators that visit them. My first hypothesis is differences in abiotic and biotic characteristics of the soil environment in tallgrass vs. hill prairies impact traits associated with pollinator attraction. I predict *Dalea purpurea* commonly known as purple prairie clover in tallgrass prairies will have: A) Greater height; B) Greater number of inflorescences; C) Greater inflorescence area; and D) Increased floral display effect. My second hypothesis is that *D. purpurea* with larger floral displays attracts a greater number and diversity of pollinators. I predict *D. purpurea* in tallgrass prairies will: A) Attract more pollinators; and B) Attract a greater variety of bee species. Preliminary analysis shows plants in tallgrass prairies were taller than hill prairies ($F_{1,3} = 13.09$ $P = 0.0004$, hypothesis 1 A), while the floral display effect of a plant is nearly significantly different between prairies types ($F_{1,3} = 3.42$ $P = 0.0627$, hypothesis 1 D). Further analysis (multivariate) is planned to further test plant growth, floral display and pollinator attraction in tallgrass and hill prairies. Starting this semester, I will conduct a follow-up greenhouse/field study to more directly link soil microbes to plant traits. The combination of approaches provides insights into how the contrasting soil characteristics of tallgrass and hill prairies enhance or diminish the attraction of plants to pollinators. Given the global decline of native bees, elucidating links between the soil microbial communities to the pollinators, mediated by the plants, will assist in determining how degraded soils need to be altered for successful restoration of plant-pollinator communities.

A CLEAR AND AFFIRMED IDENTITY; SELF-CONCEPT CLARITY, SELF-AFFIRMATION, AND STIGMA

Presenter Snodgrass, Alexa
Undergraduate, Psychology
Mentor Prof. Daniel Lannin

A. Purpose

Help-seeking for individuals with mental-health concerns may be hindered by stigma related to having mental health concerns and seeking professional help (Lannin, Vogel, Brenner, & Tucker, 2015). Self-affirmation is believed to occur when one is reminded of aspects of their identity that bolster perceptions that one is stable, adequate, and good—a process that mitigates threat to one’s self-worth (Sherman & Cohen, 2006) and reduce help-seeking self-stigma (Lannin, Guyll, Vogel, & Madon, 2013). It is possible that self-affirmations may only mitigate self-stigma when in combination with self-concept clarity, i.e., one’s sense of identity is clear, consistent, and stable (Campbell, et. al., 1996). Therefore, the present study examined whether self-concept clarity moderates the effect of self-affirmation on self-stigma of seeking psychological help in a psychologically distressed sample of college students.

B. Methods

In exchange for course credit, participants ($N = 252$; Age, $M = 19.40$, $SD = 2.17$; Sex, Female = 83.3%, Male = 13.5%; Transgender = 0.4%; Missing = 2.8%) who reported moderate and severe levels of psychological distress ($M = 10.19$, $SD = 4.05$; Range: 5–23; cf. Kessler et al., 2002; Prochaska et al., 2012) completed online assessments of self-affirmation ($\alpha = .94$; Harris et al., 2018), self-compassion ($\alpha = .86$; Raesm, Pommier, Neff, & Van Gucht, 2011), and self-stigma of seeking psychological help ($\alpha = .86$; Vogel et al., 2006), and indicated whether they had previously attended counseling (yes = 47.3%).

C. Results

A PROCESS (Hayes, 2017) regression analysis indicated a statistically significant moderation effects between self-affirmation and self-concept clarity on self-stigma of seeking psychological help, $b = -0.11$, $se = 0.04$, R^2 due to interaction = 0.02, $p = .002$. As shown in *figure 1*, the nature of this effect is such that those engaging in more self-affirmation tended to report lower self-stigma if their self-concept clarity was high, but greater self-stigma if their self-concept clarity was low.

D. Conclusions

The present study found that as the tendency to utilize self-affirmation increases, help-seeking self-stigma decreases, but only when self-concept clarity is also high. This suggests that affirming the self may lead to two different paths—depending on the clarity and stability of a person’s self-concept. Efforts to protect individuals from the harmful effects of stigma may benefit from considering ways to not only bolster self-worth but also ways to clarify and stability their identities.

HOW DEVELOPMENTAL PROGRAMMING INFLUENCES YOUTHS' AWARENESS OF THEIR ONLINE AUDIENCES

Presenter	Spraggon, Meredith Undergraduate, Psychology
Mentor	Prof. Jeremy Kanter
Authors	Meredith Spraggon; Jessica Quast; Jeremy Kanter; Daniel Lannin; Luke Russell; Ani Yazedjian; Leandra Parris

A. Problem or Major Purpose: The current study sought to evaluate how youth described the impact of participating in a relationship and job readiness curriculum on their behaviors in online environments. Social media usage is prevalent among U.S. youth with more than 81% of students reporting the use of social media at least once a week (Agosto & Abbas, 2017). Youth identify the most salient risks associated with online environments as the prevalence of strangers, the tendency for others to misrepresent themselves, and concerns about privacy (Hundley & Shyles, 2010). Increasingly, professionals have advocated for additional educational interventions to help youth navigate online challenges (Moreno et al., 2013); suggesting it may be beneficial to examine how preexisting interventions influence youths' online experiences. Therefore, the present qualitative study examined the influence of a program that combines relationship education and job-readiness training on youths' online behaviors.

B. Procedure: During Fall 2018 and Spring 2019, youth aged 14-21 in mid-central Illinois participated in focus groups conducted following a relationship education curriculum (14 focus groups, n = 205) and a job readiness curriculum (15 focus groups, n = 184). Youth responded to questions regarding their social media usage, attitudes, and how curricula influenced online behaviors. Following transcription, inductive analyses of responses were conducted following Corbin and Strauss's (2015) constant comparative method to identify core themes within the responses.

C. Results: Preliminary themes identified across focus groups center around increased awareness of variable audiences who may view youths' social media posts, images, and comments. Youth reported becoming more conscious that photos they post could be accessed by individuals with ill intentions, as well as by potential employers who may view and evaluate their online behavior. One student stated that her awareness of these dynamics increased due to the curricula, noting, "they be looking up your stuff on social media." Preliminary themes and exemplar quotes can be found in Table 1.

D. Conclusions and Implications: Our findings provide preliminary evidence that relationship and job-readiness programming may assist students in becoming more aware of digital audiences and the potential relational or employment-related consequences of social media posts. Increased awareness of these implications may assist youth in more safely navigating online environments and ensuring they do not jeopardize relational and employment opportunities.

ELDERLY MEN AS CAREGIVERS: IMPLEMENTING A SUPPORT GROUP FOR GERIATRIC MEN WHOSE PARTNERS HAVE DEMENTIA

Presenter	Stapleton, Kinsey Graduate, Social Work
Mentor	Prof. Chris Gjesfeld
Author	Kinsey Stapleton

Despite the increase of long-term care facilities throughout the United States, elderly individuals continue to face daunting obstacles in the health care industry. There continues to be a lack of supportive resources for the geriatric population as they encounter health issues in stages of later-life, particularly in rural areas-like small communities outside of Bloomington-Normal. Resources including educational courses/seminars, support groups, and counseling are often underutilized by seniors simply because they do not have access to attend. Further, men are less likely to seek these resources due to sociocultural gender norms, shame, or feelings of isolation.

This study aims to examine the impact of a support group for male Luther Oaks residents whose partners experience Dementia. The support group is held bi-weekly, with a total of four meetings, and utilizes a psychoeducational approach to facilitation and discussion amongst participants with the goal of decreasing feelings of caregiver stress. Participants of this study range in age from 72 to 88 years old and have no current cognitive impairments. Topics being covered throughout the study include signs of caregiver stress, physiological effects of Dementia, sociocultural perceptions of Dementia, and family boundaries.

COMBINATION OF SURFACE-ENHANCED RAMAN SPECTROSCOPY AND PAPER SPRAY IONIZATION ON PORTABLE INSTRUMENTATION FOR ON-SITE DRUG ANALYSIS

Presenter	Stelmack, Ashley Graduate, Chemistry
Mentor	Prof. Christopher Mulligan
Authors	William Fatigante; Daniel Burr; Jemima Lartey; Noah McClurg; John Harms; Jeremy Driskell; Jun-Hyun Kim; Jamie Wieland; Christopher Mulligan

Scientific disciplines that rely upon off-site processing of field-collected samples could be greatly impacted from analytical technologies capable of rapid, in-situ analysis. This is particularly so for forensic science and crime scene investigation, especially if said technology is capable of generating prosecutorial evidentiary data as defined by the steering committees like SWGDRUG and ASTM International. Forensic drug identification employs a two-tier strategy (i.e. two independent analyses) to ensure proper selectivity and accuracy of evidence determinations, and MS and Raman-based assays are common. In this work, our efforts towards developing and validating a ruggedized, portable platform for dual MS and Raman processing from a single sampling of evidence will be discussed, with the goal of enabling field-based, yet court admissible, evidence identification. The instrumental platform examined in this study employs surface-enhanced Raman spectroscopy (SERS) and paper spray ionization-mass spectrometry from a single paper-based substrate, coined SERS-PSI-MS. The portable MS system utilized was a FLIR Systems AI-MS 1.2 CIT-MS ruggedized for field usage, capable of chemical identification via tandem MS spectra. Raman spectroscopy was performed with a TSI ProRaman-L compact spectrometer, equipped with a 785 nm laser fiber optic probe. A custom-built positioning system was developed to allow mounting of a Raman fiber optic probe in proximity to PSI-MS paper substrate for dual analysis from a single substrate. Papers utilized were modified in-house with spherical gold nanoparticles (AuNPs) to allow trace-level SERS sensing capabilities.

INCREASED USAGE OF CASH RENT: FACTORS INFLUENCING ILLINOIS FARMLAND LEASES OVER THE PAST TWO DECADES

Presenter	Styan, Jacob
	Graduate, Agriculture
Mentor	Prof. Maria Boerngen
Author	Jacob Styan

In recent years, cash rent leases have become increasingly popular amongst farm landowners in Illinois. Since 1995, Illinois has seen a 44% rise in cash rent lease usage in Northern Illinois, a 105% increase in Southern Illinois, and a 117% increase in Central Illinois. The rise in cash rent lease usage has been attributed to many factors such as crop yields, commodity prices, crop revenue, government payments, and crop insurance. This study aims to determine which factors are the most pivotal in driving the shift toward the use of cash rent leases in Illinois. Using data from the USDA National Agricultural Statistics Service (USDA-NASS), the Environmental Working Group (EWG), and University of Illinois farmdoc, the determinants mentioned above were examined to explore the effects they have on the increasing use of cash rent leases. Comparisons were made across regions in Illinois (Northern, Central, and Southern) from 1995-2015 using a fixed effects regression model. Initial results indicate that crop insurance payments, corn price, soybean price, corn revenue, soybean revenue and commodity payments have all influenced the increasing use of cash rent leases in Illinois.

PHILOSOPHY AS A WAY OF LIFE: APPLYING PREFERENCE UTILITARIANISM TO EVERYDAY SITUATIONS

Presenter	Swanson, Alexis
	Undergraduate, Philosophy
Mentor	Prof. Daniel Breyer
Author	Alexis Swanson

Preference utilitarianism is a form of modern utilitarianism that was developed by R.M. Hare and adopted by Peter Singer (Oosterheld 2016). For preference utilitarians, the right actions are those that fulfill the preferences or interests of all organisms, existing now or in the future (Tomasik 2015). In many applied ethics courses, moral theories are applied to hypothetical situations or situations involving large-scale ethical issues such as sweatshop labor and global climate change, rather than to the students' day-to-day life. The purpose of this project was to determine if applying a moral theory to daily life is plausible and could increase empathy. According to preference utilitarianism, one must empathize with others when making a decision. I hypothesized that actively thinking about how the consequences of my own actions affect others would result in an increase in empathy. For one week, I applied preference utilitarianism to situations I encountered that required making the biggest decisions of each day. This exercise helped me understand how my normal decision-making process differs from the process I used when applying preference utilitarianism. Applying preference utilitarianism to my decision-making allowed me to reevaluate how I determine what is in my best interest. Actively applying a moral theory to my life caused me to think through my decisions more thoroughly than normal. Replication of this project could benefit others because it helps build empathy by actively involving the best interest of others in decision-making processes.

CURRENT UNDERSTANDING AND PERCEPTIONS OF SCHOOL SOCIAL WORK BY PARENTS OF MIDDLE SCHOOL STUDENTS

Presenter

Taufer, Ty
Graduate, Social Work

Mentor

Prof. Chris Gjesfjeld

Authors

Ty Taufer; Chris Gjesfjeld

The objective of the study is to examine the current understanding and perceptions of the school social work profession, the role of school social workers, and the likelihood of using their services on behalf of parents from a local faith denomination. The parents have children who attend a local middle school where they are receiving a general education in the least restrictive environment and have never worked with a social worker in the past. It is hypothesized that those who have a more accurate understanding and perception of school social workers and their roles in the school will report a greater likelihood of using their services for their students than those who have little understanding of the school social worker and their role within the school. Results, once attained, will be revealed and applied to a new abstract on the research poster.

HUMAN INSECURITY FOR THE UIGHUR MUSLIMS IN CHINA

Presenter

Theil, Jackson

Undergraduate, Politics and Government

Mentor

Prof. Michaelene Cox

My research question is, what are the human insecurities the Uighur Muslims in the Xinjiang province of China experience? Since 2017, the Uighur Muslims in China have been put in camps by the Communist Party of China. The Uighurs, especially the women and children, are at risk of being put in these camps to be reeducated. They are not allowed to leave until they are deemed reeducated. The Chinese government is saying it is doing this because it is stopping terrorism. However the real reason is a lot more complicated than that. China's Xinjiang province has had multiple separatist movements starting in the 1950's to try and become an independent country. The lives of the Uighur people are dramatically altered so that the Chinese government can control them. For example reports suggest that the Chinese government uses spies to monitor the Uighurs, tracing their communications and history on their phones. I will be using pictures from news sources and other image banks to create a photographic essay showing how the Uighur Muslims lives have changed.

MEASURING THE IMPACT: BRIEF THERAPEUTIC SUPPORT SERVICES FOR SURVIVORS OF DOMESTIC VIOLENCE

Presenter	Thirtyacre, Laura Graduate, Social Work
Mentor	Prof. Kate Sheridan

The research project titled *Measuring the Impact: Brief Therapeutic Support Services for Survivors of Domestic Violence* aims to assess the impact that the newly created adult services of The Butterfly Project at Children's Home and Aid has on participants. This program provides brief therapeutic support services to adult survivors of domestic violence, using Cognitive Behavioral Therapy and Feminist Therapy. During the opening and closing of services, participants completed the following assessments: The Index of Clinical Stress (ICS), the Parental Stress Index (PSI), Beck's Depression Inventory and the PTSD Checklist (PCL). These pre- and post-intervention scores from the assessments were used as the primary source of data, comparing the scores from before and after services to measure the impact that they might have on the participants' level of distress and their mental well-being.

THE EFFECTS OF A PLYOMETRIC STIMULUS ON INDUCING POST-ACTIVATION POTENTIATION IN DIVISION I COLLEGIATE TRACK AND FIELD ATHLETES

Presenter	Thompson, Jackson Graduate, Kinesiology & Recreation
Mentor	Prof. Nicole Hoffman
Authors	Jackson Thompson; Nicole Hoffman

INTRODUCTION: Post-activation Potentiation (PAP) is a phenomenon by which the acute force of a muscle is enhanced due to twitch potentiation from a previous conditioning exercise. Studies have demonstrated that the contractile history of a muscle is influenced by moderate to heavy resistance training or plyometric training and is often measured by sprint speed, jump height, peak torque, or peak power output. Track and Field particularly relies heavily on maximizing pure sprint speed and horizontal and vertical jumping performance. However, there have been few studies with mixed results analyzing post-activation potentiation within this population. **PURPOSE:** The purpose of this study was to examine the effect of a plyometric conditioning stimulus on inducing PAP in Division I Track and Field athletes. **METHODS:** XX Division I Track and Field sprinters and jumpers were recruited for this study. Prior to participation, individuals were randomly selected into an intervention (n=XX) or control group (n=XX). Participants in the intervention group (n=XX) completed a baseline countermovement jump, followed by the plyometric stimulus, which consisted of 2x10 ankle hops, 3x5 hurdle hops, and 5 drop jumps. After an 8-minute rest period, countermovement jump height was measured again to determine if any significant differences in height existed. The control group completed a baseline countermovement jump and another countermovement jump after an 8-minute rest period. Jump height and power output were measured at baseline and after the rest period. Data are currently being conducted, but we hypothesize that a jumping stimulus protocol would induce PAP and lead to increased jump height and peak power output. **RESULTS:** TBD **CONCLUSION:** We hope this study will provide clinicians with a valuable tool to acutely improve jump or sprint performance in Track and Field athletes in a competitive setting.

A VISUAL WALKTHROUGH OF WATER INSECURITY IN FLINT, MICHIGAN

Presenter

Toney, Anthony

Undergraduate, Politics and Government

Mentor

Prof. Michaelene Cox

Using arts-based research methodology, I will show the importance of having water security. How does water insecurity affect Flint, Michigan? Through photography, I will show areas that are not secure with quality or sufficient quantity of water and will explore negative effects that water insecurity has on the human body, and effects it has on livestock, plants, and vegetation in this area recently under crisis. Through my research, I will identify the root causes of water insecurity in Flint and how big the problem is and will contrast this with photography showing what it looks like to have water security. I will obtain my photos through the GettyImages database or news media sources.

DO SUBSTANCE INTERVENTIONS THAT USE MOTIVATIONAL INTERVIEWING IMPACT THE PARTICIPANTS LEVEL OF READINESS FOR CHANGE WITH THEIR ALCOHOL USE?

Presenter

Valle, Vanesa

Graduate, Social Work

Mentor

Prof. Chris Gjesfjeld

Authors

Vanesa Valle; Chris Gjesfjeld

In this study I will be assessing the level of readiness for change in participants use of alcohol after they attend two substance intervention sessions. The participant will be asked voluntarily to complete a pre-test and post-test SOCRATES 8A which will only collect specific data to link their pre-test and post-test scores. The SOCRATES 8A are designed to assess the participants readiness for change in their alcohol use. The first survey will be completed before receiving the alcohol or drug intervention services and the second survey will be completed after their last intervention session. The hypotheses for this study is that greater readiness will result from these intervention sessions.

COMPARATIVE APPROACH TO DETERMINE EVOLUTIONARY CONSERVATION OF NEURONAL TEMPERATURE RESPONSES

Presenter Vink-Lainas, Liisi
Graduate, Biological Sciences
Mentor Prof. Wolfgang Stein

Since all biological processes are temperature-dependent, temperature fluctuations can be detrimental to important behaviors and physiological functions. In the nervous system, increased temperature causes an imbalance of ionic conductances that are key to neural processing and communication, leading to failure of neuronal function. Maintaining nervous system function over physiological temperature ranges is thus critical for survival, especially for ectothermic animals whose body temperature fluctuates with ambient temperature. Previous studies suggest that there are compensatory mechanisms in the nervous system that counterbalance detrimental temperature effects and allow maintenance of vital behaviors. Yet, these mechanisms are not well understood despite their critical role in maintaining the execution of adequate behaviors in different temperature conditions.

To better understand temperature compensation, I am investigating temperature responses in a well-characterized motor system in the crustacean stomatogastric nervous system. This system controls rhythmic tooth movements in the animal's stomach and serves a vital function for the animal's survival. In the crab *Cancer borealis*, a temperature increase of only 3°C crashes the rhythmic neuronal activity if the system is isolated. In contrast, rhythmic activity is maintained over a broader temperature range in intact animals through a proposed mechanism that involves extrinsic neuromodulatory inputs that counterbalance temperature-induced conductance changes. It remains to be seen whether temperature compensation is an idiosyncrasy of this specific system or an evolutionary conserved mechanism. As a first step to address this question I will employ a comparative approach to identify the functional temperature ranges of several related crab species : *Cancer borealis*, *Cancer productus*, and *Carcinus maenas*.

Despite spanning a large phylogenetic distance, allowing evolutionary comparisons between them, the same stomatogastric neurons can be measured in each species. In addition, these species experience varying ranges of environmental temperatures in their habitat. I will use established electrophysiology methods to investigate temperature responses in two neuronal circuits - one intrinsically temperature-compensated and a second requiring extrinsic neuromodulatory input to function in an extended temperature range. Based on recorded activities, I will determine in what temperature ranges the rhythms remain stable. Statistical comparisons using multivariate analysis of variation will be used to determine significant differences between species. I predict that the rhythms remain functional over similar temperature ranges in species with similar habitat temperature fluctuations (*C. borealis* and *C. productus*) but are distinct from the species that experiences a different habitat temperature range.

SPRINT SPEED AND MUSCULOSKELETAL FITNESS TEST PERFORMANCE IN YOUTH

Presenter	Walleck, Brittany Graduate, Kinesiology & Recreation
Mentor	Prof. Kelly Laurson
Authors	Brittany Walleck; Kelly Laurson; Dale Brown; Karen Dennis

Sprint speed is a common focus of adult strength and conditioning programming and research. However, the links between sprint speed and other tests of musculoskeletal fitness (MSF) have not been extensively studied in youth. **PURPOSE:** To investigate the relationship between sprint speed and tests of jumping performance, muscular strength/endurance, agility, and anaerobic capacity in children and adolescents. **METHODS:** The analysis included 402 boys and 148 girls (ages 7 to 18 years) participating in a baseline MSF evaluation. Sprint speed was assessed via a 10-yard and 20-yard sprint. Agility and anaerobic capacity were assessed via the pro-agility and 200-yard shuttle run, respectively. Muscular strength and endurance were assessed by maximal number of chin-ups and jumping performance was assessed via the vertical jump, broad jump, and 5-hop jump tests. Pearson correlations were used to determine the associations between each fitness test relative to the 10- and 20-yard sprints, controlling for age and sex. **RESULTS:** Correlations were generally larger between 20-yard dash and other MSF tests than for the 10-yard dash. For example, the strongest correlation with both sprints was the pro-agility test, with $r = 0.755$ ($p < 0.001$) for the 20-yard sprint and $r = 0.655$ ($p < 0.001$) for the 10-yard sprint. Similar associations were found between the sprints and the 200-yard shuttle run, with correlations of $r = 0.758$ ($p < 0.001$) and $r = 0.640$ ($p < 0.001$) for the 20-yard and 10-yard dashes, respectively. While similar, the broad jump ($r = -0.657$ [$p < 0.001$]) had a slightly better correlation with the 20-yard sprint than either the vertical jump ($r = -0.633$ [$p < 0.001$]) or 5-hop test ($r = -0.629$ [$p < 0.001$]). The chin-up test had the smallest correlation with 20-yard sprint speed out of the MSF battery ($r = -0.414$ [$p < 0.001$]). **CONCLUSIONS:** Stronger relationships to the 10- and 20-yard sprints were found for the agility and anaerobic capacity tests compared to all MSF tests; however, all the MSF tests had greater associations to the 20-yard sprint overall. All three jumping tests were similarly associated with sprint speed. Future research is needed to determine if interventions targeting these MSF tests would lead to proportional alterations in the sprinting speed of youth.

RECONSIDERING UNDERGRADUATE ANATOMY CURRICULUM

Presenter	Walsh, Eric Graduate, Biological Sciences
Mentor	Prof. Rebekka Darner
Authors	Eric Walsh; Rebekka Darner

Anatomy education is currently undergoing widespread pedagogical reform. The existing literature employs one of three strategies to enact change. Studies seek to test the effectiveness of novel pedagogical approaches (e.g. body painting), assess the utility of integrating technological advances (e.g. interactive software), or explore the potential benefits of an altered learning context (e.g., interdisciplinary learning).

These approaches share the overarching tactic of changing how students engage with the curriculum. However, research on modifying the curriculum to bolster students' interactions with it is sparse. Therefore, this study implemented a modified three-week laboratory curriculum designed to teach undergraduate anatomy students the musculoskeletal system. The modified curriculum was inspired by complex systems theory and embodied cognition to emphasize building schemes of knowledge via active learning.

Student responses to the Anatomy Learning Experiences Questionnaire (ALEQ) and concept mapping interviews provided quantitative and qualitative data, respectively. Students experienced significantly better outcomes with the modified curriculum, which was supported by interview data, where students expressed the importance of understanding how systems function together. These findings provide the impetus for further research in anatomical pedagogical change and evidence for the hypothesis that anatomical pedagogy should emphasize understanding "*how*" more than "*what*".

ON THE IMPACT OF CLIMATE CHANGE AND CORAL REEF HEALTH

Presenter	Warden, Elisabeth Undergraduate, Mathematics
Mentor	Prof. Olcay Akman
Authors	Elisabeth Warden; Haley Schuhl

Coral reefs have been decimated over the last several decades. The global decline of reef-building corals is of particular concern. Infectious diseases are thought to be key to this mass coral mortality, and many reef ecologists suspect that anomalously high ocean temperatures contribute to the increased incidence and severity of disease outbreaks. Very little is known about how environmental changes such as increasing temperature affect disease dynamics in the ocean, especially at large spatial scales. With this work we aim to establish a mathematical association between rising global temperatures and coral reef health via artificial intelligent predictive models.

THE IMPROVEMENTS AND BENEFITS OF SERVICES PROVIDED AT ABC COUNSELING

Presenter	Weishar, Rachel Graduate, Social Work
Mentor	Prof. Kate Sheridan

This study examined client satisfaction with 3 therapeutic groups for children and families facing crises at ABC Counseling in Bloomington, IL [a psycho-educational group for adults, a group for youth with sexual behavior problems (YSBP) and a group for youth with no sexual behavior problems (non-YSBP)]. Sources of data include phone surveys. Findings will be used to inform improvements to therapeutic groups.

TESTING THE EFFECTIVENESS OF THE SOCIAL EXPLORERS CURRICULUM

Presenter

Wilhite, Laura
Graduate, Social Work

Mentor

Prof. Kate Sheridan

This study examines the effectiveness of the Social Explorers (SE) curriculum which is administered to children at Bushnell-Prairie City Elementary school with children in grades preschool and first grade.

VICARIOUS TRAUMA EXPERIENCED BY RAPE-CRISIS WORKERS

Presenter	Williams, Chimaya
	Graduate, Social Work
Mentor	Prof. Kate Sheridan

This study explored the vicarious trauma of rape-crisis workers at Stepping Stones in Bloomington, IL. Participants completed the Professional Quality of Life Scale (ProQOL) which has 30 questions and takes less than 10 minutes to complete. This assessment was administered to all staff (anticipated number of participants is 10) to establish a baseline assessment of coping with vicarious trauma and other areas of professional quality of life. Then, a series of professional development programs were scheduled for a 3 month period of time addressing issues such as burnout and self care. The ProQOL assessment will be administered a second time at the end of the 3 month period. Findings will identify areas of professional life that may be addressed in additional professional development programming, with the goal of helping staff at Stepping Stones with coping with vicarious trauma and other areas of professional life. Findings will also provide feedback regarding areas of relative strengths in the professional lives of staff at SteppingStones.

ANALYZING POLICE LETHAL USE OF FORCE ERRORS WITH HUMAN FACTORS ANALYSIS

Presenter	Woodruff, Aaron Graduate, Criminal Justice Sciences
Mentor	Prof. Mike Rossler
Author	Aaron Woodruff

The Human Factors Analysis and Classification System (HFACS) is a framework based on Reason's 1990 human error model, and developed by Shappell and Weigmann to reduce military and civilian aviation accidents. The purpose of this paper is to analyze the feasibility of using HFACS as a post mortem outline for police deadly use of force shootings to help detect patterns of active and latent failures, or causal factors, that contribute to these types of tragic errors. The results of this framework would also potentially identify strategies to help reduce future fatal errors.

MEDIATION AMONG MALADAPTIVE PERFECTIONISM, RUMINATION, AND DISTRESS: AN EXPERIMENTAL STUDY

Presenter	Woodrum, Jennifer
	Graduate, Psychology
Mentor	Prof. Jeffrey Kahn
Author	Jennifer L. Woodrum

Problem or Major Purpose

Maladaptive perfectionism has been found to be related to distress, with one's typical rumination mediating this relation (Macedo et al., 2017). We tested to see if this mediation would appear when an individual actively experiences laboratory-induced distress. This experience of failure (which we manipulated experimentally) was tested as a moderator to see if acute distress would moderate the pathway between maladaptive perfectionism and momentary rumination.

Procedure

College students (N = 121) participated in the lab. Participants completed the Discrepancy subscale from the Almost Perfect Scale-Revised (APS-R; Slaney et al., 2001) to measure maladaptive perfectionism and the past-week version of the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). Participants then were given a fabricated intelligence test (an anagram task). To induce distress, some participants (the failure condition) were randomly assigned a task with a combination of extremely difficult and unsolvable anagrams and were told that the average score was 14.2. Other participants (the non-failure condition) received a task with anagrams of average difficulty and were told that the average score was 12.1. Participants in the failure condition were significantly more distressed and scored lower on the anagram task than the non-failure condition, $p < .01$. Participants then completed follow-up questionnaires to measure their use of rumination during the anagram task and resulting distress utilizing the momentary version of the PANAS Negative Affect subscale.

Results

We used PROCESS to examine the moderated mediation model. Rumination mediated the relation between discrepancy and momentary negative affect, controlling for one's negative affect over the past week (see Figure 1). The indirect effect was significant for the non-failure condition with the bootstrapped 95% confidence interval ranging from .01 to .10. The indirect effect was non-significant for the failure condition.

Conclusions and Implications

Maladaptive perfectionism was associated with increased negative affect and increased rumination when participants experienced induced acute distress. We replicated findings from previous research (Macedo et al., 2017) in a laboratory experiment to demonstrate that the mediation model appears in the moment. The model appeared for the non-failure condition, but the model did not appear for the failure condition, which indicates that the manifestation of perfectionism varies in different situations. This poster will demonstrate these findings, provide information about their interpretation, and suggest future research.

INTERNALIZED TRANSPHOBIA IN RURAL ILLINOIS PUBLIC SCHOOLS

Presenter	Yanez, Jordee Graduate, Social Work
Mentor	Prof. Chris Gjesfjeld
Authors	Chris Gjesfjeld; Jordee Yanez

The purpose of this research is to see the level of internalized transphobia by hired professionals in a public Illinois school district. Participants are hired professionals by a public school district of Illinois who volunteer to participate in the survey. Method for this will be via a survey that was created in the late '90s and has provided great data through the years.

Results are pending as research is still in progress. Hypothesis is that school safety is a public health crisis where recent studies have found high levels of transphobia to include physical, sexual violence, and prevalent harassment affecting trans students specifically in school settings (Atteberry-Ash, Kattari, Speer, Guz, & Kattari, 2019; Blair, & Deckman, 2019) This research will show the high levels of internalized transphobia in a small rural public school district in Illinois which will help justify the need for professional development trainings for transgender support in public schools in Illinois.

SYNTHESIS, CHARACTERIZATION, AND EVALUATION OF RUTHENIUM(III) COMPLEXES TO TARGET AND MODULATE THE AGGREGATION OF AMYLOID-BETA

Presenter	Yawson, Gideon
	Graduate, Chemistry
Mentor	Prof. Michael Webb
Authors	Samantha Huffman; Michael Webb

Alzheimer's disease (AD) is characterized by the observation of protein deposits comprised primarily of the peptide amyloid-beta ($A\beta$) which leads to physical changes within the brain and eventually death of an AD patient. The full-length $A\beta$ peptide (amino acids 1-42) contains histidine residues that have revealed affinities towards endogenous metal ions. Metal-based therapeutics exploit this binding affinity and have shown promise in modifying and inhibiting $A\beta$ aggregation as well as cytotoxicity induced by the peptide in vitro. Recently, two ruthenium(III) anticancer metal complexes KP1019 (indazolium [trans-RuCl₄(1H-indazole)₂]) and NAMI-A (imidazolium [trans-RuCl₄(1H-imidazole)(DMSO-S)]) along with a new complex PMRU20 (2-aminothiazolium [trans-RuCl₄(2-aminothiazole)₂]) were subjected to $A\beta$ aggregation inhibition studies. Whilst it was interesting to find that KP1019 and NAMI-A showed minimal activity, PMRU20 was the best candidate for preventing $A\beta$ aggregation and toxicity. Nevertheless, there is a dearth of information relating to the structure and activity of these types of complexes. Therefore, in our quest to probe the effects of ruthenium(III) complexes in binding to the protein, we have altered the groups around the metal center to optimize the design of structures to find out their ability to inhibit $A\beta$ from aggregating. Preliminary evaluation of the complexes assessed their aqueous stability, peptide binding, and inhibition of aggregation. Altogether, the results of this study will detail the preferred binding mode of $A\beta$ along with aggregation inhibition profiles of Ruthenium(III) metal complexes.

THE IMMEDIATE EFFECTS OF DRY CUPPING THERAPY AND PERCUSSIVE THERAPY ON TRICEPS SURAE TRIGGER POINT PAIN AND ANKLE DORSIFLEXION

Presenter	Ybarra, Michael Graduate, Kinesiology & Recreation
Mentor	Prof. Justin Stanek
Authors	Michael Ybarra; Justin Stanek

Context: Limited dorsiflexion (DF) range of motion (ROM) is commonly observed in both the athletic and general population and has been shown to be a predisposing factor for lower extremity injury. Dry cupping therapy and percussive therapy are treatments that has been shown to increase ROM directly after application. Evidence of a comparison of the two interventions is currently lacking. Including using the specific tools such as Theragun G3 Pro and Rock Pods.

Objective: To compare the immediate effects of dry cupping and percussive therapy on triceps surae trigger point pain and ankle dorsiflexion to a control.

Design: Cohort; randomized control trial.

Setting: Laboratory

Patients or Other Participants: 30 physically active participants (60 limbs) with less than 34 degrees of dorsiflexion participated. Participant's limb(s) were randomly allocated to one of three groups: Dry cupping therapy, percussive therapy, and a control. Participants in the all groups had their closed-chain DF ROM (standing and kneeling) assessed at baseline and post intervention. The dry cupping intervention group received 6 minutes of treatment at three identified trigger points within the triceps surae. The percussive therapy intervention group received 5 total minutes of treatment, collectively, at each identified trigger point at the triceps surae group. The control group comfortably laid on the treatment table for 5 minutes and received no treatment.

Main Outcome Measures: Closed chain DF was assessed with a digital inclinometer in standing and kneeling. Pain pressure threshold was assessed with a digital pressure algometer. Subjective pain intensity was measured using a visual analog scale.

Results: Results have not been obtained

Conclusions: Research is currently in progress

THE ROLE OF SHARED VISION IN THE SURVIVAL OF MULTIGENERATIONAL FAMILY BUSINESSES

Presenter	Zbinden, Kaiti Undergraduate, Agriculture
Mentor	Prof. Iuliia Tetteh
Authors	Iuliia Tetteh; Kaiti Zbinden

Succession planning plays a vital role in the survival of a family business from one generation to the next. However, if succession planning is so critical, why do only 30 percent of family businesses survive from the first generation to the second, only 12 percent from the second generation to the third, and only 4 percent from the third generation to the fourth (Poza 2013). Previous studies have revealed that having a shared vision for the future of the multigenerational family business increases the likelihood of a smooth and effective leadership transition. If a shared vision is so important to the multi-generation survival, why are there gaps in having one? The purpose of this study is three-fold: first, to conduct an in-depth literature review on various aspects/factors that impact the creation and use of shared vision for the future of the firm by the younger and older generations, second; to develop a survey instrument that will be used to identify if multigenerational family farm businesses indeed have a shared vision for the future of the farm; and third, to draw on the existing evidence from agriculture and non-agriculture fields to identify practical strategies to create a shared vision and increase the probability of survival of a family farm business.

2020 Symposium

Group Abstracts – Morning Session

THE SUPPORT OF COMMUNITY PROGRAMS FOR FAMILY ASPIRATIONS AND SELF-DETERMINATION IN LATINO YOUTH EDUCATION

Group Leader	Almanza, Luz Undergraduate, Psychology
Group Members	Gabriela Miranda, Undergraduate, Psychology; Bailey Clarahan, Undergraduate, Psychology
Mentor	Prof. Jordan Arellanes
Authorship	Luz Almanza; Gabriela Miranda; Bailey Clarahan; Jordan Arellanes

Thesis/aims/goals

The purpose of this study was to deepen the understanding of Latino immigrant families' experiences and perspectives related to their involvement in their children's education and to describe their potential. An article by Patten (2016) stated 47% of U.S. born Latinos are under 18 years old. This young population now represents 23% of all youth in the U.S. educational school system (Ryan & Bauman, 2016). Latino families provide stability and are involved in their children's education in unique ways due to current educational policies, social interactions, and cultural expectations. Family involvement in schooling is commonly measured quantitatively, without understanding culturally appropriate practices in education such as the ability to care for their youth's future, monitor their homework, and to be active in the youth's educational life both in the home and in the formal school setting (Castro, et al, 2015).

Methods:

From 2016-2018, sixteen focus group interviews were conducted with Latino families to deepen the understanding of family's experiences and perspectives in their children's educational attainment. A total of 93 individuals from 50 different families participated in this study. Semi-structured interview protocols guided the descriptive interview-based approach for the focus groups and follow up individual interviews. MAXQDA 20 was used for data management. Data was audio-recorded and transcribed verbatim in Spanish, and then translated to English. Five trained undergraduate researchers independently coded the materials then met and collaborated to create a coding scheme. The coding scheme was analyzed to identify overarching themes that illustrated key findings.

Results and Conclusions

Parents were often fearful of coming to the schools due to a lack of Spanish speaking professionals, immigration issues, and a lack of trust of school officials. Teachers were respected as the experts in the school, but familial expectations of the roles of teachers in the classroom were not being met. The youth in this study state that they felt that a few teachers are supportive of their education, but that there is much room for teachers to learn and grow when supporting a culturally diverse classroom.

This study provides insight into the ways in which Latino families are actively involved in their children's educational attainment and recommends more culturally representative and effective community programs. Families are calling for help from teachers and administration, but information goes missing or does not focus on proactively supporting youth educational outcomes. Implications from this study provide important research and practical policy suggestions.

WHEN DOES HAVING ONE'S FAN INTERESTS IGNORED THREATEN PSYCHOLOGICAL NEEDS?

Group Leader	Atkinson, Cody Graduate, Psychology
Group Members	Tyler Pederson, Undergraduate, Psychology; Miette Daluga, Undergraduate, Psychology; Amy Bajaczyk, Undergraduate, Psychology
Mentor	Prof. Eric Wesselmann
Authorship	Cody Atkinson; Tyler Pederson; Amy Bajaczyk; Miette Daluga

Many people consider themselves a fan of something (e.g., music, film, sports). Individuals often discuss their fan interests with others, whether these individuals are fans of that same object or not. However, these interactions may be a double-edged sword: A positive interaction can make someone feel socially connected and valued by others, whereas a negative interaction (i.e., person is disinterested) may have the opposite effects. Previous research suggests that negative interactions most likely occur when interacting with a non-fan, and these experiences can make someone feel relationally devalued and experience threats to basic psychological needs (e.g., belonging, self-esteem). However, open-ended responses to these negative interactions were mixed: some participants described events that upset them whereas other participants explicitly stated the event in question did not upset them. The current study investigates this pattern further using directed experimental primes. First, we ask participants (current N = 74) to identify the most important thing they considered themselves a "fan" of. We then asked participants to recall one of three different events based on random assignment: 1) a time when they had a conversation about their fan object with a non-fan who did not seem interested and it upset them, 2) a time when they had this type of interaction and it did not upset them, or 3) a time they ate breakfast by themselves (control condition). Participants then completed measures of perceived relational value and psychological need satisfaction based on how they recalled feeling during the event. Data collection is in progress; our minimum target sample size is 150 participants (50 participants per cell). We will continue collecting into the Spring semester until we reach that number. We will analyze our data using a one-way ANOVA and post-hoc comparisons with Bonferroni corrections for multiple comparisons. We will also investigate a potential indirect effect of our manipulation on basic need satisfaction via perceived relational value. Finally, we will probe the open-ended responses to investigate potential themes that characterize interactions that upset participants and those that do not. These data will provide further details about the types of social interactions that fans have with non-fans, and how these interactions ultimately impact fans' psychological well-being.

AUDIT OF HOSPITAL ACQUIRED COMPLICATIONS THROUGHOUT ILLINOIS HOSPITALS

Group Leader	Birchfield, Hannah Undergraduate, Health Sciences
Group Member	April Post, Undergraduate, Health Sciences
Mentor	Prof. Jennifer Peterson
Authorship	Hannah Birchfield; April Post

This audit compares the data of hospital acquired complications for four Hospitals in Illinois. The research team selected five categories reported by Leapfrog Hospital Safety Grade website and compared the data between those hospitals. The categories that were selected are surgical wounds split open, C. Diff infections, dangerous bed sores, infections in the urinary tract, and collapsed lungs. The team then gathered information from the worst hospital scores and the best hospital scores in the United States and averaged them to determine the standard rate for the audited hospitals.

MALADAPTIVE PERFECTIONISM AND THE DISCLOSURE OF DISTRESS

Group Leader	Bopp, Mallory Undergraduate, Psychology
Group Members	Elizabeth Marsh, Undergraduate, Psychology; Dorothy Taylor, Undergraduate, Psychology
Mentor	Prof. Jeffrey Kahn
Authorship	Mallory Bopp; Elizabeth Marsh; Dorothy Taylor

Past literature has shown that people who typically talk with others about their unpleasant thoughts or emotions over-all feel more content and happier (Kahn & Garrison, 2009). However, maladaptive perfectionists tend to avoid disclosing to others in order to minimize or completely ignore their mistakes as an attempt to maintain their supposed perfect image (Hewitt et al., 2003). A diary study done by Richardson and Rice (2015) showed that self-critical perfectionism weakened the positive relationship between daily stress and the disclosure of that stress. Yet, as seen in naturalistic studies, daily stress might change function in regard to an individual's perfectionism. This study was intended to test Richardson and Rice's hypothesis that maladaptive perfectionism would moderate the within-person stress-disclosure association using hypothetical scenarios that would be considered stressful. Generalized disclosure tendencies and depressive symptoms were controlled given their known effects on the relationship between disclosure and stress (Garrison & Kahn, 2010).

Students from Illinois State University (N = 325) participated in an online survey which included the Almost Perfect Scale-Revised (Slaney et al., 2001), Distress Disclosure Index (Kahn & Hessling, 2001), and CES-Depression Scale-Revised (Eaton et al., 2004). After completing the questionnaire, participants read ten hypothetically stressful scenarios and rated each of the events on (a) emotional intensity (Dunkley et al., 2003) and (b) likelihood of disclosing to others (Garrison et al., 2012).

The results of this study found that discrepancy, one of the three sub-scales of the APS-R, was the only significant predictor of generalized disclosure tendencies. Further testing showed that anticipated disclosure in response to the scenarios was positively predicted by the emotional intensity of the event, generalized disclosure tendencies, depression symptoms, as well as standards, which was unexpected. Significant interactions were found between disclosure tendencies and emotional intensity. In regard to perfectionism, an interaction between standards and intensity was found such that the positive association between intensity and disclosure weakened as standards increased. Finally, an interaction was found which involved order such that the positive relationship between intensity and disclosure strengthened as order increased.

While maladaptive perfectionism was associated with a lower tendency to disclose distress, it was not associated with anticipated disclosure of hypothetical, stressful events. While this study was unable to replicate the results of Richardson and Rice's diary study (2005), it was able to replicate related research showing a positive association between maladaptive perfectionism and self-concealment (Kawamura & Frost, 2004).

INFUSING A CURE INTO THE MEDICAL LABORATORY SCIENCE PROGRAM

Group Leader	Brown, Angela Undergraduate, Health Sciences
Group Members	Hannah Swanson, Undergraduate, Health Sciences; Valerie Wozniak, Undergraduate, Health Sciences; Ewurabena Okai, Undergraduate, Health Sciences; Erin Brown, Undergraduate, Health Sciences; Lisseth Bustamante, Undergraduate, Health Sciences; Jane Bartlett, Undergraduate, Health Sciences; Holli Winter, Undergraduate, Health Sciences
Mentor	Prof. Beverly Barham
Co-Mentor	Prof. Deborah Johnson
Authorship	Angela Brown; Hannah Swanson; Valerie Wozniak; Ewurabena Okai; Erin Brown; Lisseth Bustamante; Jane Bartlett; Holli Winter

All students in the Medical Laboratory Science (MLS) cohort of 2021 (n=22) participated in a course based undergraduate research experience (CURE) in the fall semester 2019. The 5 basic components for a CURE include: 1) use of multiple scientific practices, 2) the outcome is unknown, 3) there is a broader relevance or importance beyond this classroom experience, 4) collaboration is essential among students and instructors, and 5) iteration is built into the process.

Members of this MLS cohort took on the role of primary researcher in an applied research protocol by collecting, analyzing, and reporting data from specimens they collected from residential plumbing determining the incidence of opportunistic mycobacteria present. MLS students assembled the collection kits and then collected specimens from residential plumbing faucets (bathroom sink, bathtub, showerhead, kitchen sink, or laundry room sinks). Each student analyzed the specimens they collected for the presence of opportunistic mycobacteria. Opportunistic mycobacteria are included as one of five different opportunistic plumbing pathogens that can be found in residential plumbing. An Auramine O fluorescent antibody stain, specific for opportunistic mycobacteria, was performed on each specimen. The data for the applied research portion indicated that 7% (n=44) of the specimens collected were positive for opportunistic mycobacteria in the residential plumbing specimens. City water was the water source for all faucets tested and specimens originated from 6 different zip code areas.

These same MLS students then reflected on the overall CURE experience as the human subjects involved in this research. Students were asked to complete 4 short anonymous surveys regarding the areas of the IRB process, the collection protocol, the fluorescent staining process, and meeting the objectives of a CURE. The data generated from these reflections indicated students felt they had a better understanding of the IRB process, the collection protocol was efficient, there was agreement that the staining and interpretation of the modified Auramine O fluorescent staining was a positive experience, and that the overall CURE experience met the parameters of a true CURE. This CURE model included all students and provided equal access and an equitable experience as a part of their class participation.

FOSTERING CHANGE: SCHOOL PERSONNEL MICROAGGRESSION TRAINING

Group Leader	Cicciarelli, Kara Graduate, Psychology
Group Member	Khyati Verma, Graduate, Psychology
Mentor	Prof. Brea Banks
Authorship	Brea Banks; Kara Cicciarelli; Brooke Ferrero; Khyati Verma

Although diversity and inclusion trainings focused on microaggressions have become popular, few have examined how such trainings for school personnel contribute to behavior change. Researchers will present the results of a study that examined the impact of two half-day trainings with school personnel regarding microaggressions. Attendees dedicated to diversity and inclusion efforts will gain insight into a best practice model for an intervention to improve school climate.

DIFFERENCE IN BIMANUAL PERFORMANCE BASED ON HANDEDNESS, TOY, AND AGE

Group Leader	Cortina, Sara Graduate, Psychology
Group Member	Robert Pearson, Undergraduate, Psychology
Mentor	Prof. Julie Campbell
Authorship	Sarai Cortina; Robert Pearson; Julie Campbell; George Michel

Problem or Major purpose

A relation between handedness for acquisition and role-differentiated bimanual manipulations (RDBMs) has been demonstrated as infants use the same hand for performing these actions (Babik & Michel, 2015). RDBMs occur when one hand stabilizes an object while the other hand performs a fine motor action on the object. These complex actions require two hands working together to accomplish a goal (Babik & Michel, 2015). Previous research has demonstrated that consistent handedness provides an advantage for performing cognitive functions (Nelson et al., 2017), that toy-type affects the frequency of RDBMs performed (Babik & Michel, 2015), and that RDBM frequency increases with age (Nelson et al., 2013). This project assessed the effect of handedness consistency, toy-type, and age on RDBM performance.

Procedure

Data from 44 infants (11 early-right, 11, late-right, 11, late-left, 11 no-preference) were derived from archived videos to explore the relation of acquisition hand preference, toy-type, and age with RDBM efficiency (speed of an infant completing an RDBM). This project used video data from 9-months to 14-months for each infant. Videos were examined for the time to complete simple and difficult RDBMs. The start time was indicated by the infant's initial contact with an object and stop time was indicated by completion of a RDBM action. Toys elicited simple (poking, stroking, or sliding) or difficult actions (pushing, pulling, spinning, twisting, insertion, or removal).

Results

A mixed repeated measures ANOVA between age and handedness with a Greenhouse-Geisser correction revealed a main effect of age on RDBM speed, $F(3.41, 105.60) = 10.93, p < .001$. There was no significant effect of handedness ($F[3, 31] = .843, p = .48$) and no interaction between age and handedness ($F[10.22, 105.60] = 1.76, p = .08$). Bonferroni post hoc tests showed that RDBM speed at month 9 was significantly different from months 11-14 (see Fig. 1). A one-way repeated measures ANOVA with a Greenhouse-Geisser correction revealed that toy-type does not have a significant effect on RDBM speed, $F(1, 45) = .05, p = .83$.

Conclusions and implications

Infants with different handedness did not demonstrate different times to complete RDBM. The type of toy does not affect RDBM performance. The average times for RDBM completion decreased across time, meaning RDBM efficiency increased as the infant got older. Perhaps any differences that may exist between handedness groups for speed when performing RDBMs occurs sooner than 9 months.

AN ANALYSIS OF PARENT CHILD SHARED BOOK READING WITH INFANTS AND TODDLERS

Group Leader

Delia, Gianna

Graduate, Communication Sciences and Disorders

Group Members

Ashleigh Tira, Undergraduate, Communication Sciences and Disorders; Carly Cheatham, Undergraduate, Communication Sciences and Disorders; Hanna Bimma, Undergraduate, Communication Sciences and Disorders; Isabelle Frautschy, Undergraduate, Communication Sciences and Disorders

Mentor

Prof. Ciera Lorio

Authorship

Ciera Lorio; Gianna Delia; Ashleigh Tira; Carly Cheatham; Hanna Bima; Isabelle Frautschy

Shared book reading is a well-researched tool to promote child development and resiliency in families. Research on parent-child shared book reading (SBR) has shown positive relationships with child language outcomes, (Towson, 2014; WWC, 2007) but these studies primarily include children older than 3 years. Little is known about the SBR behaviors of parents and their children under the age of 3. It may be important to examine shared book reading with infants/toddlers to determine which aspects of the experience are linked with child outcomes and maintenance of shared book reading routines in homes. In this poster, we will present results from a scoping review of the literature related to infant/toddler shared book reading, which revealed a limited number of studies that directly examined parent and infant/toddler behaviors during shared book reading experiences. Multiple article searches were conducted in 4 different databases, resulting in 13 studies that met inclusion for the review. Some of the key findings from the review included a lack of studies on interventions to support parents in using interactive shared book reading strategies with their infants and toddlers. In general, there is also limited research on parent and child behaviors during shared book reading between parents and infants/toddlers. Most studies on parent-child shared book reading with infants/toddlers include children at-risk for delays or disabilities, and few have examined book reading interactions with infants/toddlers that have diagnosed disabilities. Eight studies included an intervention to support parents in reading with their infants/toddlers, but only 1 included the use of coaching and 5 included some type of modeling, feedback, or prompting. A majority of the studies focused on teaching parents how to use questions and expansions/extensions during shared book reading, and no studies included strategies to support child vocabulary learning.

The results of the scoping review led to a longitudinal study examining parent-child shared book reading practices beginning when children were 6 months of age through 36 months. This poster presentation will end with a brief description of the current study, including a review of the data collection procedures and some preliminary data. At this time, we have a total of 23 parent-child dyads, and 72 videos collected. Videos are currently being coded for vocalizations, initiations, responses, total number of words, total number of different words, as well as mean length of utterances (MLU). Additionally, videos are being coded for gestures and engagement/interaction. Towson, J.A., Gallagher, P.A. (2014). Training head start parents in dialogic reading to improve outcomes for children. *International Journal of Child Health and Human Development*, 7(3), 287-296. U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, What Works Clearinghouse (WWC). (2007a). What works clearinghouse intervention report: Dialogic reading. Retrieved from https://ies.ed.gov/ncee/wwc/Docs/InterventionReports/WWC_Dialogic_Reading_020807.pdf

DO INTRINSIC AND EXTRINSIC MOTIVATION ENCOURAGE DIFFERENT FACETS OF HOPE?

Group Leader	Halverson, Hailie Undergraduate, Psychology
Group Members	Kailey Greene, Undergraduate, Psychology
Mentor	Prof. Daniel Lannin
Co-Mentor	Prof. Luke Russell
Authorship	Hailie Halverson; Kailey Greene; Daniel Lannin; Jeremy Kanter; Luke Russell; Ani Yazedjian

The present study examined the association among intrinsic and extrinsic life goals and different aspects of hope. Results indicated that the type of motivation that adolescents are oriented toward influences the type of hope they experience. Bolstering intrinsic motivation may be an important consideration for practitioners who work with youth.

STUDENT ENGAGEMENT IN A HYBRID UNDERGRADUATE STATISTICS COURSE

Group Leader	Hemming, Paige Undergraduate, Psychology
Group Members	Dante Caruso, Undergraduate, Psychology; Kira Wade, Undergraduate, Psychology
Mentor	Prof. Adena Meyers
Authorship	Paige Hemming; Dante Caruso; Kira Wade

This presentation describes the application and evaluation of a variety of instructional technologies in teaching a hybrid version of an intermediate undergraduate statistics class. Specifically, we examine what happened when activities formerly delivered in person (such as lectures) or completed in analog paper-and-pencil format (such as homework) were moved to online platforms, and we discuss strategies for fostering engagement, scaffolding skill development, and assessing learning through a combination of in-person and online efforts.

We use two measures of student engagement to evaluate our instructional methods. The first is a measure of students' use of online lessons (primarily consisting of video-recorded lectures) developed by the instructor specifically for this class. The second is an index of engagement provided by the online textbook publisher. It is based on the time spent reading the textbook as well as activities performed while reading such as highlighting and searching within the text.

Preliminary analyses from a recent cohort of 49 students indicate that engagement with the online lectures and the textbook are both important predictors of performance on course assignments and assessments. Correlational analyses will be conducted to determine the magnitude of this importance as well as to compare student engagement from last semester to the current semester. These analyses will be updated with data from the current academic year, affording an opportunity to examine changes over time as we develop and employ new strategies to increase engagement and performance.

Presenters include the faculty instructor and three teaching assistants who experienced the class first as students and later as instructional assistants. We will describe the online and in-person elements of the class and explain why each was selected; discuss barriers to student learning in statistics (such as math phobia, fixed mindsets, limited prerequisite skills, and time management difficulties); and offer strategies for overcoming these barriers in the context of a hybrid course. Students will offer observations from the perspectives of both learners and instructors. We will invite participants to share their experiences and insights related to optimal ways to combine online technologies with in-person instruction.

DOES DISCRIMINATION EVOKE AN ORIENTATION TOWARD MATERIALISTIC VALUES?

Group Leader	Horton, Alexandra Graduate, Psychology
Group Member	Tyler Pederson, Undergraduate, Psychology
Mentor	Prof. Daniel Lannin
Authorship	Alexandra Horton; Tyler Pederson; Dan Lannin; Jeremy Kanter; Luke Russell; Ani Yazedjian

The present study explored the relationship between race, discrimination, and a materialistic values orientation (MVO). MVO corresponds to an orientation wherein an individual prioritizes a cluster of goals centered around consumerism that include achieving financial success, cultivating an attractive appearance, and having a high social status (Kasser, Ryan, Couchman & Sheldon, 2004). One pathway by which MVO develops is as a compensatory response to feelings of insecurity; that is when individuals feel threatened they are more likely to compensate for this distress by pursuing goals related to MVO, as opposed to pursuing goals that meet deeper psychological needs of affiliation, autonomy, and competence (Kasser, 2016). Given perceived discrimination is inherently threatening for minoritized populations (Seaton, Caldwell, & Sellers, 2010), it stands to reason that greater rates of discrimination may be one means by which minoritized populations are urged toward greater MVO. Therefore, the present study predicted discrimination would mediate the relationships between racial minority status and MVO.

LONELINESS: EXPLAINING THE LINK BETWEEN SOCIAL MEDIA RUMINATION AND PSYCHOLOGICAL DISTRESS

Group Leader	Hynes, Keeley Graduate, Psychology
Group Member	Marissa Berens, Undergraduate, Psychology
Mentor	Prof. Daniel Lannin
Co-Mentor	Prof. Luke Russell
Authorship	Keeley Hynes; Marissa Berens; Jeremy Kanter; Daniel Lannin; Luke Russell; Leandra Parris; Ani Yazedjian

Purpose

The present study examines the association among social media rumination, loneliness, and psychological distress. Recent research has linked increasing social media engagement with increased psychological distress (Twenge, 2019); however, the nature of youths' experiences on social media may be a more proximal predictor of mental health than the quantity of their usage (Chen & Lee, 2013). One possibility is increased social media usage may increase ruminative social comparison (Vogel et al., 2017). Social media rumination-the tendency to repetitively think about one's social media posts, related situational factors, and consequences of those posts-may contribute to feelings of loneliness and by extension greater psychological distress (cf. Vanhalst, Luyckx, Raes, & Goosens, 2012). The present study empirically examined a mediation model testing whether ruminating on social media content was associated with greater psychological distress due to increased loneliness.

Procedure

During fall 2019, 184 youth aged 14-21, participating in the Champaign Area Relationship Education for Youth (CARE4U) program, completed pretest survey data. Participants completed questionnaires assessing loneliness (van Roekel et al., 2018), social media rumination (developed by authors), and psychological distress (Kessler et al., 2002). Parent permission and child assent were taken before the administration of surveys.

Results

Hayes (2018) PROCESS analyses tested direct and indirect effects in our hypothesized model via conducting 5,000 bias-corrected bootstrapped samples. Results indicated social media rumination directly predicted greater psychological distress ($\beta = .20, p = .001$), and the indirect effect via loneliness was also statistically significant ($\beta = .14, 95\% \text{ CI} = [0.06, .23]$). Overall, the model explained 12% of the variance in psychological distress.

Conclusions

The present study found social media rumination is linked to higher levels of psychological distress for youth who sign up for a school-based intervention. In particular, this relationship was partially mediated by loneliness, suggesting that one avenue in which social media rumination can influence well-being is through feelings of loneliness. Thus, although social media may be an avenue to cultivate social connections from afar, it can also make youth feel isolated compared to others. Longitudinal research is warranted within this area of inquiry. Social media rumination and loneliness may be bidirectional over time, prospectively influencing each other and ultimately worsening psychological functioning. Implications for educational interventions for youth will be discussed.

SYNTHESIS AND BIOLOGICAL EVALUATION OF ANAEPHENE A AND B

Group Leader	Kukla, David Undergraduate, Chemistry
Group Member	Juan Canchola, Undergraduate, Biological Sciences
Mentor	Prof. Jonathan Mills
Authorship	David Kukla; Juan Canchola; Jonathan Mills

There is a critical need for the development of new antibiotics due to the increasing number of multidrug-resistant bacterial strains and the diminishing number of novel classes approved. The Center for Disease Control and Prevention (CDC) reported that over two million illnesses and 23,000 deaths in the United States are due to antibiotic resistance. In order to combat this problem, innovative therapeutic strategies are required. The natural products, anaephene A and B were recently isolated from an undescribed filamentous cyanobacterium (VPG 16-59) from the genus *Hormoscilla* collected off the coast of Guam. These compounds displayed antimicrobial activity against *Staphylococcus aureus* and *Bacillus cereus*. We have completed the first syntheses of anaephene A and B. Both natural products were synthesized in five linear steps from commercially available TBS protected 3-iodophenol. Key steps for the synthesis included a Sonogashira cross-coupling and a Julia-Kocienski olefination to selectively construct the E-alkene present in the natural products. This synthetic route allowed the identity and antimicrobial activity of anaephene A and B to be confirmed. Additionally, we have demonstrated that these compounds display antimicrobial activity against methicillin-resistant *Staphylococcus aureus* (MRSA).

EXAMINATION OF COLORFASTNESS OF WATERLESS DYED LEGGINGS

Group Leader	Lowe, Breianna Undergraduate, Family and Consumer Sciences
Group Members	Briaanna Voss, Undergraduate, Family and Consumer Sciences; Maddy Zitkus, Undergraduate, Family and Consumer Sciences
Mentor	Prof. Ui- Jeen Yu
Authorship	Maddy Zitkus; Breianna Lowe; Brianna Voss; Tanajiah Fields; Sigourney Porter

In the fashion industry there are high amounts of chemically tainted wastewater that is being used in the production of textile products. Waterless dyeing is a new dyeing process that doesn't require water. Instead, this waterless dyeing process takes CO₂ to dye the textile products. CO₂ use for dyeing textiles is more sustainable for the environment and will save freshwater that is typically being used to dye textiles. Traditional dyeing processes use large amounts of water, energy, and chemical additives to fix the dye on the fibers. Using CO₂ instead can decline the level of pollution and drastically decrease the number of chemicals used in textile dyeing. The purpose of this study was to examine the colorfastness of waterless dyed fabric through AATCC standard test methods. We examined a waterless dyed pair of leggings made from 79% recycled polyester and 21% elastane through AATCC 15 Colorfastness to Perspiration, AATCC Colorfastness to Crocking, AATCC 61 Colorfastness to Laundering, and AATCC 19 Colorfastness to Flat Abrasion (Frosting). Results indicate the waterless dyed fabric had color change and/or staining issues in colorfastness to perspiration, crocking, laundering, and frosting. Consumers would have low satisfaction of colorfastness performance, especially if the waterless dyed garment was not cared for properly. The possible defects would include color or shade change in the garment as well as possible abrasion and color change in areas of the garment that rub or experience the most contact. Additional textile testing should be conducted to create more in-detail information about the waterless dyed fabric performance for consumers' wise choice of waterless dyed fabrics.

JOHNS AND LYNCH'S THEORY OF RELATIONAL STATUS FOR FIRST-GENERATION WOMEN STUDENTS

Group Leader	Lynch, Meaghan Graduate, Educational Administration & Foundations
Group Members	Kaytee Johns, Graduate, Educational Administration & Foundations
Mentor	Prof. Gavin Weiser
Authorship	Kaytee Johns; Meaghan Lynch

Inspired by history and personal experience and informed by previous theories and research, we generated a student development theory that investigates the intersection of gender and first-generation status. We emphasize the importance of relationships for first-generation college women's development, building on Schlossberg's (1989) theory of Marginality and Mattering, Bronfenbrenner's (1993) Developmental Ecology Model, and Janet L. Surrey's (1983) "self-in-relation" theory of women's development. We chose to emphasize relationships because feelings of support and belonging greatly impact student success and retention, especially in the case of minoritized populations like first-generation women. We explore the differing levels of support that first-generation women college students receive from three specific types of relationships: familial, peer, and mentor relationships. These relationships each fall on their own spectrum, with more support from each type of relationship contributing to feelings of support and belonging in higher education. Our theory places students at the center of their varying relationships, representing their support networks that influence their collegiate experience.

THE EFFECT OF INFORMAL FEEDBACK PROCESSES ON CWB: EXPLORING BOUNDARY CONDITIONS

Group Leader	Maher, Miranda Graduate, Psychology
Group Members	Megan O'Rourke, Graduate, Psychology; Ryan Barry, Graduate, Psychology
Mentor	Prof. Dan Ispas
Co-Mentor	Prof. Alexandra Ilie
Authorship	Jessica Chackoria; Ryan Barry; Miranda Maher; Megan O'Rourke; Alexandra Ilie; Dan Ispas; Jeremy Bauer; Burcu Rodopman

We examined the association between feedback environment (FE) and CWB, and factors that could moderate this relationship. Our results showed that FE and CWB were negatively correlated (unfavorable FEs were linked with more CWB). This association was strengthened as employees' workplace hostile attribution bias (WHAB; a tendency to assume the worst motives behind actions) increased. However, increases in proactive personality weakened this association. Possible mechanisms, implications, and limitations have been discussed.

BARRIERS TO PHYSICAL ACTIVITY PARTICIPATION AT THE STUDENT FITNESS CENTER IN REFERRED EIMOC CLIENTS

Group Leader	Mindiola, Kaitlin
Group Members	Graduate, Kinesiology & Recreation Alex DiSerio, Graduate, Kinesiology & Recreation; Teadora Markovski, Graduate, Kinesiology & Recreation
Mentor	Prof. Kristen Lagally

PURPOSE: The purpose of this study was to examine the barriers to being physically active at the student fitness center for clients in an Exercise is Medicine on Campus (EIMOC) program. **METHODS:** Student health services refers students who would benefit from increased physical activity to an EIMOC program implemented by Kinesiology faculty and students in the Exercise Physiology Laboratory. Referred students respond to 12 items concerning potential barriers to participating in physical activity at the student fitness center using a scale of 1 (strongly disagree) to 5 (strongly agree). **RESULTS:** Sixty-five college-aged students (Women=53, Men=12) responded at the onset of the EIMOC program. Forty-two (65%) of the 65 indicated that they do not use the student fitness center while 23 indicated that they do. Means (+SD) for all 65 subjects indicated that the top three barriers to using the student fitness center were "I don't know what exercises to do" (3.6+1.3), "It's too crowded" (3.6+1.2), and "I compare myself to others frequently at the rec center" (3.5+1.3). Other items resulting in mean values >3 included "I am embarrassed to be physically active around other students", "I feel like others are evaluating me", and "I don't know how to work the equipment." Separate one-way ANOVAs were used to compare 1) those who were and weren't using the student fitness center and 2) males and females. ANOVA indicated significant differences between those using (U) and not using (NU) the student fitness center for "I don't feel comfortable" (U=2.6+1.1; NU=3.2+1.2, p=0.04), "I am embarrassed to be physically active around other students" (U=3.0+1.1; NU=3.7+1.1, p=0.03), and "I feel competitive with others" (U=2.6+1.4; NU=1.8+1.1, p=0.02). When men and women were compared, significant differences were noted with "I don't feel comfortable using the locker rooms" (Women=2.3+1.3; Men=3.3+1.4, p=0.03), "I don't know what programs are offered" (Women=2.5+1.3; Men=3.8+1.2, p=0.002), and "The Rec doesn't offer programs that interest me" (Women=1.7+0.9; Men=2.8+1.0, p=0.001). **CONCLUSION:** Identifying barriers specific to this population may help to develop programs that can increase physical activity levels for individuals within special populations. The results identify barriers that can be meaningfully addressed by qualified exercise professionals.

EVALUATING THE TRAUMA-INFORMED PROGRAM FOR PROMOTING SUCCESS USING QUALITATIVE INTERVIEWS

Group Leader	Okrasinski, Lucy Undergraduate, Psychology
Group Members	Caitlyn Jezowitz, Graduate, Psychology; Jessica Foley, Graduate, Psychology
Mentor	Prof. Adena Meyers
Authorship	Jessica Foley; Caitlyn Jezowitz; Lucy Okrasinski

This research project is part of the evaluation of the Trauma Informed Program for Promoting Success group intervention (TIPPS). The intervention consists of nine lessons designed to help students navigate friendships, family issues, and identifying stressors. Children were identified for the intervention using a screener test and teacher referrals. Lessons were given weekly to local middle school students. The program is being evaluated with a mixed method approach that includes comparisons of the students scores on pre and post-test measures of peer relationships and emotional regulation, as well as qualitative interviews. This presentation focuses on the qualitative aspect. Students from this group intervention were invited. for one-on-one interviews led by group leaders. Individual interviews were conducted to gain insight into the perceptions of the program, as well as help identify common themes regarding children's perceptions of the intervention. During the interviews children are asked about their experiences in the TIPPS program, including questions about what they liked or disliked, and what components they may have found helpful.

THE EFFECT OF PEER MEDIATION ON SOCIALIZATION FOR ELEMENTARY SCHOOL CHILDREN WITH AUTISM SPECTRUM DISORDER

Group Leader	Perera Taboas , Amanda Graduate, Psychology
Group Members	Emily Vershaw, Graduate, Psychology; Rachel Geary, Graduate, Psychology; Megan Cully, Undergraduate, Psychology; Lauren Tomasson, Undergraduate, Psychology; Nitza Torres Gonzalez, Psychology
Mentor	Prof. Karla Doepke
Authorship	Amanda Perera; Nitza Torres Gonzalez; Emily Vershaw; Rachel Geary; Megan Cully; Lauren Tomasson

Social interaction and communication play a significant role in the academic, social-emotional, and behavioral development of children; however, this skill has been known to be particularly challenging for children diagnosed with autism spectrum disorders (ASD). Given the importance that social functioning has for academic and career success, it is critical to identify effective and efficient strategies for improving the social skills of children with ASD. This study will examine two strategies that can be implemented in the school setting designed to enhance social functioning in children with ASD. First, this study will examine the effectiveness of peer-mediated intervention, which involves utilizing same-aged peers modeling appropriate interaction skills and behaviors for children with ASD. While this topic has been researched with younger children, relatively limited evidence is available examining the effectiveness of peer-mediated intervention with older children. This study will also examine the potential additive effects of incorporating imitation in the peer-mediated intervention on improving social skills with children with ASD. In addition to measuring the effectiveness of the interventions in the children with ASD, this investigation will examine potential changes in empathy in the peer models. Utilizing a multiple-baseline design across participants, the effectiveness of a peer-mediated intervention will be examined with fourth and fifth grade students diagnosed with ASD in a lunchroom setting. The relative added effectiveness of imitation will be examined using a multi-element design. Potential changes in empathy in the peer models will be examined using pre- and post-intervention questionnaires.

CHILD-FOCUSED ASSESSMENT OF PROTECTIVE FACTORS FOR SUICIDE RISK IN ASD

Group Leader	Rillo, Jessica Graduate, Psychology
Group Member	Amber Richardson, Graduate, Psychology
Mentor	Prof. Karla Doepke
Authorship	Jessica Rillo; Amber Richardson; Garrett Hawkinson; Karla Doepke

Little is known about suicide risk and resilience within children with autism spectrum disorder (ASD). Early identification of at-risk children with ASD requires an understanding of both risk factors that predispose an individual to suicidal behaviors and protective factors that buffer against suicidal behaviors. In neurotypical children, depression and anxiety are the primary risk factors, and social support and adaptive coping are among the protective factors (RRR). Much less is known about risk factors in children with ASD, although it is widely assumed that depression and anxiety are implicated. This study will assess child-reported thoughts of suicide, depression, and anxiety as well as theory of mind and repetitive behavior in children with autism. In addition, the results will provide a unique perspective on protective and risk factors for suicide in this population.

ON ANTIMAGIC LABELING OF LOBSTERS

Group Leader	Samsami, Ian Undergraduate, Mathematics
Group Members	Brett Klepitch, Undergraduate, Mathematics; Josette Green, Undergraduate, Mathematics
Mentor	Prof. Songling Shan
Authorship	Ian Samsami; Brett Klepitch; Josette Green

An antimagic labeling of a graph G with m edges is a function $f : E(G) \rightarrow \{1, \dots, m\}$ such that distinct edges receive distinct numbers and any two vertex sums are distinct, where a vertex sum is the sum of the labels of all edges incident to that vertex. A lobster is a tree with a central path such that all vertices are within distance two from the central path. We explore patterns of antimagic labeling for connected lobsters with at least three vertices.

AUDITORY READINESS AND EARPLUG ATTENUATION: A PILOT STUDY TO EXAMINE THE GAPS IN NOISE AND MODIFIED RHYME TESTS FOR AN OCCUPATIONAL

Group Leader	Smiley, Spencer Undergraduate, Communication Sciences and Disorders
Group Members	Kat Mann, Undergraduate, Communication Sciences and Disorders; Aaliyah Gladney, Undergraduate, Communication Sciences and Disorders; Ryan Saxon, Undergraduate, Communication Sciences and Disorders; Clara Marchini, Graduate, Communication Sciences and Disorders
Mentor	Prof. Antony Joseph
Authorship	Spencer Smiley; Kat Mann; Aaliyah Gladney ; Ryan Saxon ; Clara Marchini; Antony Joseph

The purpose of this pilot study was to examine whether the Gaps in Noise (GIN) and Modified Rhyme test (MRT) might be incorporated into a test battery for Occupational Audiology applications, specifically Auditory Readiness. The pilot sought to address the question, "Can the GIN and MRT be used to determine if a worker can safely perform hearing critical tasks while wearing earplugs?" The GIN and MRT were administered while six test subjects were unoccluded and occluded in the right ear, and earplug personal attenuation ratings (PAR) were measured as well. The viability and results of the application will be discussed.

INVESTIGATING THE ROLE OF SIGMA-1 RECEPTORS IN AMPHETAMINE-INDUCED DOPAMINE SIGNALING

Group Leader	Smith, Brad Graduate, Biological Sciences
Group Members	Ashley Salzman, Graduate, Biological Sciences; Brittany Rivera, Graduate, Biological Sciences
Mentor	Prof. Paul Garris
Authorship	Brad M. Smith; Ashley Salzman; Brittany Rivera; Paul A. Garris

Substance use disorder, characterized by impulsive drug use despite adverse consequences, affects millions of individuals in the United States and leads to significant physical and psychological consequences. One class of abused drugs, psychostimulants, has an identified medical use but carries a significant dependence liability as a result of rewarding properties originating, at least in part, in the midbrain. Dopamine (DA) neurons originating in the midbrain fire both tonically and phasically, with phasic signaling leading to bursts of action potentials that generate DA transients in the striatum. These DA transients are characterized as sub-second to second increases in extracellular DA that drive reward learning. Psychostimulants, including amphetamine, hyper-activate phasic DA signaling by increasing the amplitude, duration, and frequency of DA transients. This activation is related to amphetamine increasing burst firing of dopamine neurons and increasing DA release and inhibiting DA uptake via the dopamine transporter. This hyper-activation of phasic DA signaling leads to pathological overlearning of the importance of the drug and can lead to problematic patterns of use. At present, there are no FDA-approved pharmacotherapies for the treatment of stimulant use disorder. However, the sigma 1 receptor (sig1r), an endoplasmic reticulum chaperone protein involved in calcium signaling, has been shown to exert a modulatory influence on DA neurons and alter rewarding properties of psychostimulants. It may therefore represent a target for therapeutic development. In this study, sig1r ligands are utilized to examine the sig1r contribution to amphetamine-induced DA signaling. This signaling is studied using the technique of fast-scan cyclic voltammetry (FSCV) at a carbon-fiber microelectrode (CFM), which generates temporally and spatially resolved in vivo measurements of DA transients from regions of the brain implicated in reward learning. Electrically-evoked DA signals are also measured by FSCV at a CFM and analyzed using a kinetic model that allows for quantification of both DA release and DA uptake in response to varying drug conditions. The overall goal of this study is to add to the understanding of amphetamine mechanism of action and determine sig1r contributions to amphetamine-induced alterations in DA signaling.

EVALUATING DEVELOPMENTALLY SUPPORTIVE PARENTING BEHAVIORS DURING PLAY AND SHARED BOOK READING INTERACTIONS

Group Leader	Theleritis, Maesyn Undergraduate, Communication Sciences and Disorders
Group Members	Adrianna Jakubowski, Undergraduate, Communication Sciences and Disorders; Abigail Vyhnanek, Undergraduate, Communication Sciences and Disorders
Mentor	Prof. Ciera Lorio
Authorship	Maesyn Theleritis; Adrianna Jakubowski; Abigail Vyhnanek; Ciera Lorio

The Parenting Interactions with Children: Checklist of Observations Linked to Outcomes, or PICCOLO, is a checklist of 29 developmentally supportive parenting behaviors organized across four domains: Affection, Responsiveness, Encouragement, and Teaching (Roggman et al., 2013). This checklist can be used with families of children between the ages of 10-47 months, and it has been tested on a large, culturally diverse sample of families. It is considered a reliable and valid checklist, that is also practical for use in clinical settings. The PICCOLO is considered a "strengths-based measure" and may be an effective tool for supporting parents in increasing parenting behaviors that support social, cognitive, and language development (Roggman, Boyce, & Innocenti, 2008). When parents use the behaviors listed in the PICCOLO checklist, they are more likely to establish positive and secure relationships with their children, leading to increased opportunities for practicing emotion regulation, building resiliency and curiosity, and supporting cognitive and language development. The use of responsive parenting behaviors is especially important during the infant and toddler years, as this is a critical window of development for expressive and receptive language skills (Kuhl, 2011). Each student on this poster has completed training on the PICCOLO checklist and is considered a reliable PICCOLO coder for a longitudinal research study in the Language and Literacy Lab. This study focuses on shared book reading behaviors between parents and infants/toddlers and the impact of shared book reading on early language and literacy development. In this poster presentation, students will further describe the four domains of the PICCOLO and their relevance to language development in young children. They will share their experiences using the PICCOLO while coding videos of parent-child interactions, presenting preliminary data to compare parent responsiveness during videos of parent-child shared book reading and parent-child play.

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PROCRASTINATION VS. PRECRASTINATION: WHAT DETERMINES WHAT WE DO?

Group Leader	Villarreal, Selena Graduate, Psychology
Group Member	Hannah Skelton, Undergraduate, Psychology
Mentor	Prof. Dawn McBride
Authorship	Selena Villarreal; Hannah Skelton

Procrastination literature is quite extensive and tends to be associated with many different negative outcomes such as perfectionism, psychological distress, and self-regulation (Ozer et al., 2014; Rice et al., 2012, Sirois et al., 2017, Stöber et al., 2001). Self-regulation has been suggested to be one of the most significant predictors of procrastination (Ozer et al., 2014). However, research regarding precrastination is less prevalent. Precrastination is defined as the tendency to complete a task early even at the expense of extra effort (Rosenbaum et al., 2014). It is suggested that people structure their behavior this way in order to free up their cognitive resources, particularly when given simple task choices; this is known as the CLEAR hypothesis (Vonderhaar et al., 2019). While precrastination can be seen as adaptive, it could also have negative drawbacks. Precrastinating causes one to share attention across tasks, so this could lead one to be more susceptible to mistakes or accidents (Fournier et al., 2019). In the end, there are still many unanswered questions regarding the newer phenomenon. The purpose of the current study is to investigate three questions: (1) Does task type affect task order choices (i.e., procrastination vs. precrastination)? (2) When one chooses to precrastinate, does that task suffer from more errors as opposed to when one waits to do the task later? and (3) Does self-regulation play a role in precrastination as it does in procrastination? Participants are asked to complete a computerized box-moving task while also having to either (1) solve simple math problems or (2) generate a list of items from a specific category. Participants' level of self-regulation is also assessed by questionnaire.

THE GET-ACQUAINTED PROCESS AS A FUNCTION OF MODE OF COMMUNICATION

Group Leader	Yonan, Angela Undergraduate, Sociology/Anthropology
Group Members	Mary Mulligan, Undergraduate, Sociology/Anthropology; Katie Benshoof, Undergraduate, Sociology/Anthropology; Morgan Margiotta, Undergraduate, Sociology/Anthropology; Ariya Hatami, Undergraduate, Sociology/Anthropology; Makayla Smullin, Undergraduate, Psychology; Christian Maynard, Undergraduate, Sociology/Anthropology
Mentor	Prof. Susan Sprecher
Authorship	Angela Yonan; Mary Mulligan; Katie Benshoof; Morgan Margiotta; Makayla Smullin; Ariya Hatami; Leah Reish; Christian Maynard

With the increase in communication technologies (Sprecher & Hampton, 2017), social scientists have become interested in examining the outcomes of the get-acquainted process and whether the channel of communication affects the participants' perceptions of the interaction (Ruppel et al., 2016). While early research focused primarily on comparing a text-based computer-mediated-communication with face-to-face communication (Jiang et al., 2013), only more recently have face-to-face interactions been compared to video-mediated communication, such as a Skype conversation (Fox & McEwen, 2017). This recent research has compared face-to-face conversations with video-conversations on multiple dimensions, including verbal and nonverbal cues, attraction, and closeness (Croes et al., 2018). For example, Antheunis, Schouten and Walther (2019) examined the difference between initially communicating with a person by text-based communication versus video conferencing before meeting them face-to-face. They found that the pairs who engaged in text-based computer-mediated-communication increased in their social attraction, which was not found for those in the other condition. Now that video communications are becoming more common, including when people first become acquainted after meeting online (Sprecher, 2014), it is important to examine more specifically how the get-acquainted process differs based on mode of communication.

In the Social Relations Lab at ISU (directed by Dr. Susan Sprecher), we have been involved in a multi-semester study that examines pairs of college students becoming acquainted (through a self-disclosure task). The getting-acquainted dyads are randomly assigned to self-disclose (i.e., become acquainted) in either a face-to-face setting or over Skype-video. After the 24-minute interaction, the participants (138 making up 69 dyads) completed several outcome variables, including liking, closeness, and enjoyment. Results indicate that becoming acquainted over Skype-video is almost as effective as becoming acquainted face-to-face for generating liking and other interpersonal outcomes. Generally, there were no negative effects on the affiliative outcome variables of self-disclosing over Skype-video as compared to face-to-face. The exception was for fun and enjoyment, which was found to be higher for the face-to-face group than for the Skype-video group. Due to the recent shift towards a more technologically advanced society, one might expect technology would have a negative effect on communication, but our findings suggest otherwise. This conclusion is applicable as online dating becomes more prevalent and society becomes more hyper connected than ever before (Finkel et al., 2012).

HEART RATE VARIABILITY: A 16-WEEK EXAMINATION OF STRESS MANAGEMENT EDUCATION AND PHYSICAL ACTIVITY ON HRV

Group Leader	Zinn, Cara Undergraduate, Kinesiology & Recreation
Group Members	Alex DiSerio, Graduate, Kinesiology & Recreation; Ayla Kibler, Graduate, Kinesiology & Recreation
Mentor	Prof. Karen Dennis
Co-Mentor	Prof. Alex Wolfe
Authorship	Cara Zinn; Alex DiSerio; Ayla Kibler; Karen K. Dennis; Alex M. Wolfe

Heart rate variability (HRV) had been described as the time interval between heartbeats and has been shown to be an important aspect of overall health.

Stress is a phenomenon that influences heart rate variability. During stressful events, the sympathetic nervous system is aroused. Physiologically, stress appears in the form of lowered HRV, with decreased parasympathetic activity, increased sympathetic activity, and increased levels of cortisol. This can be altered through a system of exercises and stress management education referred to here as HRV training.

Previous research (Dennis and Wolfe, 2016; Dennis and Wolfe, 2017) has shown that physical activity and exercise intensity has a positive effect on Heart Rate Variability. Further, achievement of moderate intensity physical activity recommendations may have a greater influence on stress than total steps per day (Dennis and Wolfe, 2018).

Purpose:

The purpose of this study was to continue to investigate the effects of physical activity and other biometric variables on HRV over the course of a semester-long (16-week) course designed around lifestyle education and stress management HRV training.

Methods:

The subjects for this research were 23 students enrolled in the KNR 113 "Personal Fitness" course. The duration of this study lasted one academic semester (16-weeks). All participating students were assigned a pedometer (New Lifestyles) that was used to track their steps each day. Each student had physical fitness and biometric data collected at the beginning and end of each semester, in addition to having HRV measurements taken at the beginning and end of each semester. HRV measurements were taken using the HeartMath emWave pro software using an infrared pulse plethysmograph (ppg) ear sensor. Physical activity data was collected each week of the course through self-reported pedometer logs. Lifestyle education and exercise were the primary focus of the curriculum for the class. Weekly assignments given through the HeartMath website were used to educate students on stress management techniques.

Results: To Be Determined