P77. Leader Humor and Job Satisfaction: The Mediating Role of LMX

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Leader's use of humor has demonstrated its importance in research as it has been found to affect
many work-related outcomes such as productivity, communication, and job satisfaction. From the research on types of humor and job satisfaction, it has largely been found that leader's use of positive humor is positively associated with subordinates' job satisfaction, while use of negative humor has been found to undermine subordinate job satisfaction. However, some of the literature has found contradicting results to this usual finding when adding leader-subordinate relationship quality (LMX) into the equation. As these contradicting findings were only found in a collectivistic culture, the purpose of this study is to determine if LMX will mediate the relationship between leader humor type and subordinate job satisfaction in an individualistic cultured society such as the US. A multiple regression test will be used to analyze the influence of LMX on the relationship between leader humor type and subordinate job satisfaction. It is expected that LMX will mediate this relationship, such that positive humor will have a positive influence on job satisfaction when LMX is high and a negative influence when LMX is low, while negative humor will have a negative influence when LMX is low and a positive influence when LMX is high. This finding will potentially demonstrate the importance of leader subordinate relationship quality in the context of leader humor and change the approach used by
leaders in improving subordinates'
job satisfaction.

Mentors: Todd Manson, Department of Psychology, School of Social Sciences, IU Southeast

P55. Role of ADR-2 in Receptor Mediated Endocytosis of Yolk Proteins

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RNA editing is the process by which gnomically encoded information is altered to generate transcriptome diversity. This editing, in turn, alters gene expression. Adenosine deaminases that act on RNA (ADARs) catalyze adenosine (A) to inosine RNA editing events. ADARs are present in all animals and are critical for normal development and function. The absence or mutations of ADARs have been shown to cause numerous neurological diseases, as well as cancers. ADARs are highly expressed in both embryo and adultC. elegans. ADARs, especially ADR-2, are expressed in the germline of early adult C. elegans. Previous work in the Hundley lab has shown that ADR-2 interacts with receptor mediated endocytosis and yolk protein genes. In order to assess this interaction, an ADR-2 mutant lacking the ADR-2 gene with vitellogenin (VIT-2) yolk protein tagged with GFP was created. A wildtype worm with VIT-2 yolk protein tagged with GFP was also created. These mutants were used in further research by utilizing worm imaging and worm egg laying assay techniques to determine how this loss of ADR-2 affects the endocytosis of yolk proteins. It was determined that the wildtype worm with GFP yolk protein produces less eggs than the ADR-2 mutant worm. These results can be used in further research to determine how the overexpression of vitellogenin proteins affects embryonic development within C. elegans.

Mentors: Dr. Heather Hundley

P2. The Impact of Urbanization on Song Repertoire Size of Song Sparrows

Samantha Alcantara, Dustin E. Brewer,
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Environmental Resilience Institute, Indiana University Bloomington

Due to urbanization and deforestation, songbirds also known as Melospiza melodia have been forced out of their natural habitat and forced into unnatural habitats like parking garages where they face unnatural light and human intrusion. Songs are learned during their first year, but song sparrows that mature under harsh conditions are unable to learn as many songs. Since female song sparrows are attracted to males with larger repertoires, no one knows what effects urbanization has had on their repertoire size or future population size. This study was conducted in Kent Farm, a rural forest area, and on IU Bloomington's Campus. To measure complete male song sparrow repertoires, each bird had at least 220 songs recorded within the span of a week using recording equipment. To analyze the songs spectrograms, which are visual representations of sound, were used. The Descriptive Function on Microsoft was utilized in order to see the differences of song repertoire size between the two samples. The mean repertoire size for the urban sample was 10.5 song types while the mean repertoire size for the rural sample was 8.5 song types,

resulting in a 2.0 average song difference. However, due to the small sample size, further statistical analysis would result in inaccurate results. Based on the extremely small sample and limited analysis, it is recommended that more research is done in order to fully understand the various factors that can explain the difference in repertoire sizes and the overall effect of urbanization on song sparrows.

Mentors: Dustin Brewer, Environmental Resilience Institute, Indiana University Bloomington; Adam Fudickar, Environmental Resilience Institute, Indiana University Bloomington

O41. Comparative Analysis of American Versus Chinese Science Education

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With science being taught ubiquitously across the United States and China, this research looks to differentiate the core differences in the approaches to education of each nation in both urban and rural areas. With competition between nations increasing, it is important to analyze the successes of each nation and the areas requiring improvement to optimize learning outcomes. Without critical analysis of education techniques and a willingness to improve based on the tactics employed by other nations, students in the United States could stagnate leading to a downturn in economic development. Primary resources will be drawn from a year's worth of personal experience teaching ESL in Hangzhou, China as well as experiences in science classrooms in the United States, Dr. Hollenbeck's experiences teaching/advising Chinese educational institutions over several years, and resources drawn from documented sources. Preliminary research indicates that a more structured lecture approach is employed in Chinese schools that utilizes less technology overall and focuses on the lower aspects of Bloom's taxonomy. Schools in the United States, meanwhile, are moving more into guided project-based learning, more reliance on technology, and a focus on the higher aspects of Bloom's. Based on initial findings there appears to be a greater ability from the Chinese method to recall crucial and relevant information while the US method yields a greater ability to solve more complex issues. With this research, an optimal bridging of these two methods could be undertaken.

Mentors: James Hollenbeck, IU School of Education, IUS; Eric Robinson, Jeffersonville HS, IN

P57. Anxiety Behavior and Whole-Body Cortisol Responses to Components of Energy Drinks in Zebrafish (Danio rerio)

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This study investigated the independent and combined effects of two of the most common additives of energy drinks on anxiety and neuroendocrine responses in adult zebrafish (Danio rerio), a suitable vertebrate to examine stress responses due to physiological and genetic homology with humans. Caffeine, the world's most commonly used psychoactive drug, acts as a mild central nervous system stimulant and can induce anxiety-like behavior when consumed excessively. Taurine, a semi-essential amino acid synthesized with the human brain, has been hypothesized to play a role in anxiolysis. This raises the question regarding the actions of these two chemicals on anxiety-like behavior when consumed together. Anxiety-like behavior in zebrafish can be determined by habituation when placed in the novel tank test (NTT). Additionally, zebrafish can be used to determine neuroendocrine responses to stress, namely cortisol. The goal of the current study was to determine if exposure to caffeine, taurine, or a combination of the two compounds altered anxiety-like behavior measured by the novel tank test (NTT)and whole-body cortisol levels in zebrafish. None of the drug treatments affected cortisol levels. Caffeine treatment induced anxiety-like behavior, as shown by reduced exploration in the NTT compared to the control. Taurine alone did not alter basal levels of behavioral responses; however, taurine attenuated caffeine-induced anxiogenic effects on behavior when co-administered with caffeine. These results suggest that taurine may work to mitigate the anxiety-producing effects of caffeine in energy drinks.

P38. Faith-Based Diplomacy and Interfaith-dialogues for Peacemaking and Conflict Resolution

Tejus Arora
IU School of Public and Environmental Affairs

Conflicts that engender due to differences in cultural-identities have proven to be intractable especially when faith is at the center of it. These intricate faith-based conflicts such as Kashmir, Ireland, Israel-Palestine are especially difficult to resolve as there is immense amount of history and suffering involved which has devastated the communities in the middle of it. The traditional peacemaking efforts, where representatives from the conflicting factions would be delegated to negotiate a resolution, have largely been futile to solve conflicts of such kind. This need of a more non-traditional method, which keeps faith, dialogue, and relationship-building at grassroots level, gave rise to a new approach to peacemaking: Faith-Based Diplomacy (FBD). Through this study, it is aimed to explore the efforts of motivated third-party organizations at utilizing the strategies of Faith Based Diplomacy which integrate politics, faith and religion, and other conflict resolution methods aimed at grassroots and civil level organizations. The FBD centered organizations employ an eclectic mix of tools such as back-channels, shuttle diplomacy, religious/spiritualistic activities, and dialogues to reconcile the conflicting factions. It is found that the Faith

Based Diplomacy is a potent movement which has proved to not only foster reconciliation but also healing on the grassroot level across the factions in an intractable identity-based. It is necessary to understand the successful elements of this approach to gauge their utility in resolving some of the contemporary conflicts which have triggered some of the worst humanitarian crisis.

Mentor: Gary Branham, Organizational Ombudsman, IRS, Washington, D.C.

O42. Using Twitter to Promote Learning

Cortney Baird

In today's schools, technology is the source that schools are using. So why are we not using social media to promote good learning and good skills. Twitter can be used for many different things including promoting good learning, keeping the parents involved and having some fun in the classroom. In this study, I plan to look and find how Twitter is helping students and faculty get involved in not only the classroom but in the community around them. This information can be found by studies done by schools to see if more student participates in more activities if they were promoted on Twitter. It can also be used to let kids know when homework is done or an upcoming test that need to study for. The results of test grades and the students who did their homework is another way that research can be found for this study. Twitter can be used to help the student engage in the classroom and in the real-world. It also is a tool that can be used by schools and districts nationwide to collaborate. Social media is a huge platform for schools so why not use it to their advantage?

O11. For He Himself Has Said It: The Political Dichotomy of Sir James Brooke, Rajahof Sarāwak

Alejandro Barrett Lopez
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This project is focused on the reign of Sir James Brooke, Rajah of Sarāwak and the dichotomy of his life, being both British subject and an independent sovereign. The goal is to demonstrate that Sir James Brooke, and his successors, are a unique element in the history and legacy of the British Empire –corresponding neither to the sanctioned Empire-building done by the likes of Sir Stamford Raffles and Clive of India, or to the filibustering subterfuge of William Walker or Narciso Lopez. This has been done by examining the letters and journals of Brooke, the biographies made of him by close acquaintances, British Parliamentary records, court documents, and Naval dispatches concerning Brooke's activities. Examination of these documents shows how Brooke's place in the British Empire is exceptionally vague and ill-defined and that his 'type' of Imperialism bears careful consideration and evaluation.

Advisor: Peter Guardino, Department of History, IU Bloomington

P68. Media Coverage and Political Action: The Fight for Clean Water

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1Department of Sociology, IU College of Arts and Sciences

The purpose of this research is to illuminate the impact that media coverage has on political action in cases of lead contamination in water. Media coverage of two specific lead related crises will be compared, including that which occurred in Washington D.C. in 2001 and a decade later in Flint, Michigan. These two cases are important to analyze because the population effected in both areas have a large portion of residents who are minorities and live below the poverty line. Additionally, both cases were exposed by the media after government agencies had not informed residents of the danger associated with drinking their tap water. Examining how media coverage generates political action may establish a pathway for future activism while providing a platform for toxicity awareness and further government regulations. Data will be collected using the American newspaper database US News Stream. A content analysis will be conducted by comparing news about, and surrounding, the lead contamination published by one local and one regional newspaper from both Flint and Washington D.C. After analyzing the newspaper articles that fit within the data parameters, an examination of political action, government intervention, and access to clean water will be systematically conducted using the statistical program, Atlas. This study has immediate relevance as the number of cities impacted by a wide range of pollutants to their water sources continue to grow globally. The extent to which the media plays a role in social action has important implications for the future of water wars.

Mentors: Pamela Jackson, Department of Sociology, IU College of Arts and Sciences; Orla Stapleton, Department of Sociology, IU College of Arts and Sciences

P5. The Influence of Diabetes on Retinal Capillary Blood Flow in Patients with Glaucoma

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Purpose: To determine the influence of diabetes mellitus (DM) on ocular blood flow in primary open-angle glaucoma (POAG) patients. Methods: 42 patients (21 with DM; 21 without) with POAG were assessed for intraocular pressure (IOP) via Goldman applanation. Heidelberg Retinal Flowmeter was utilized to assess peripapillary retinal capillary density and mean blood flow. Color Doppler imaging assessed ophthalmic (OA), central retinal (CRA) and nasal and temporal short posterior ciliary arteries

(N/TPCA) for peak systolic (PSV) and end diastolic (EDV) blood flow velocities, and vascular resistivity index (RI) was calculated. Pearson correlation and multivariate linear regression analysis were performed. Results: In DM patients, the correlations between CRA PSV and EDV and inferior retinal avascular area were weak (r=0.294, r=0.078); conversely non-DM patients displayed strong negative correlations (r=-0.508, r=-0.583). DM patients also had a weak correlation between CRA RI and inferior retinal blood flow (r=-0.096) while non-DM patients had a stronger positive correlation (r=0.466). In DM patients, there was a weak association between TPCA RI and inferior retinal blood flow (r=-0.043) while non-DM patients showed a stronger correlation (r=0.497). Conclusion: In DM patients, increased retrobulbar blood flow was associated with decreased retinal microcirculation and increased IOP. These correlations were significantly different in non-DM patients. This data suggests that DM POAG patients may experience a potentially pathogenic relationship between the blood vessels supplying ocular tissues and localized retinal capillary blood flow compared to non-DM POAG patients.

Mentors: Dr. Brent Siesky and Dr. Alon Harris of the Glick Eye Institute, Department of Ophthalmology, Indiana University School of Medicine, Indianapolis, Indiana, USA.

P9. Overexpression of WNT16 does not Prevent Cortical Bone Loss due to Glucocorticoid Treatment in Mice

Alam1, D.K. Oakes1, A.M. Reilly1,
Caylin. Billingsley1, S. Sbeta1, R.L. Gerard-O'riley1, D. Acton1, A. Sato3, T. Bellido1,3, M.J. Econs1, 2Section 1Medicine, 2Medical and Molecular Genetics, 3Anatomy and Cell Biology, Indiana University School of Medicine, IN, USA

Glucocorticoids (GC) are commonly used for the treatment of a wide variety of autoimmune, pulmonary, gastrointestinal and malignancy conditions.
One devastating side effect of GC use is osteoporotic fractures. Bisphosphonates (BPs) are the most commonly prescribed intervention for the prevention and treatment of GC-induced osteoporosis (GIO); however, GIO is marked by reduced bone formation while BP mainly decrease bone resorption. Previously, we demonstrated that over-expression of WNT16 in mice led to higher bone mineral density, improved bone microarchitecture and strength. We hypothesized that WNT16overexpression would prevent bone loss by GC treatment in mice. We treated adult wild-type and WNT16-transgenic mice with vehicle and GC via pellets for 28 days. We found that GC treatment compared to the vehicle significantly decreased femoral aBMD, BMC, cortical bone area and thickness in both wild-type and transgenic female mice. In contrast, the trabecular bone parameters at distal femur were not significantly changed by GC treatment in male and female mice or both genotypes. Significantly lower level of serum P1NP and a tendency of higher level of serum TRAP in wild-type and transgenic mice due to GC treatment in both sexes was observed. Gene expression analysis showed lower mRNA levels of Wnt16, Opgand Opg/Rankl ratio in GC-treated female mice for both genotypes compared to the sex-matched vehicle-treated mice. These data suggest that although WNT16 overexpression resulted in higher baseline bone mineral density and BV/TV in the transgenic mice, this was insufficient to prevent bone loss in mice due to GC treatment.

Mentors: Imranul Alam, Ph.D.

P6. Identifying Influential Trisomic Genes in Addition to Dyrk1a that Contribute to Skeletal Phenotypes Found in Down Syndrome

Matthew P. Blackwell, Jared Thomas1, Jonathan LaCombe1, Eva Lana-Elola2, Sheona Watson-Scales2, Victor Tybulewicz2, Elizabeth M. C. Fisher3, Joseph M. Wallace4,
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Bone abnormalities including osteoporosis result from skeletal developmental deficits caused by Down syndrome (DS). DS mouse models have been shown to recapitulate deficits seen in humans with DS. The Ts65Dn mouse modelhas ~100 trisomic genes, and trisomic Dyrk1ahas been shown to have a causal role in bone phenotypes. Similar skeletal phenotypes and sexual dimorphism in how these phenotypes occur has been identified in Dp1Tyb mice (148 trisomic genes). A mouse mapping panel has been created from the contiguous segmental trisomic regions included in the Dp1Tyb mouse model and these Dp2Tyb, Dp3Tyb, and Dp9Tyb mouse models can be used to identify trisomic genes or regions involved in specific bone phenotypes. We hypothesize that trisomic genes in addition to Dyrk1amake important contributions to the skeletal traits characterized in DS. To test this hypothesis, we performed structural and mechanical analyses of femurs from male and female Dp2Tyb, Dp3Tyb, and Dp9Tyb mice. Trisomic candidate genes present in these strains include Dual-specificity tyrosine phosphorylation-regulated kinase 1A (Dyrk1a) onDp3Tyb, Regulator of calcineurin 1 (Rcan1) and Runt related transcription factor 1 (Runx1) on Dp2Tyb, and Amyloid beta precursor protein (App) and Nuclear receptor interacting protein 1 (Nrip1) on Dp9Tyb, genes that may play important roles in skeletal formation and maintenance. This research will provide insight into the complex genetic and phenotypic interactions that contribute to the skeletal abnormalities found in DS.

Mentors: Dr. Randall J. Roper

P16. A role for lipid-lipid interactions in vitamin E's function as a membrane antioxidant

Samuel W Canner1,2, Fangqiang Zhu1, Scott E Feller3, Stephen R. Wassall1

Vitamin E (α-tocopherol) is the principle lipid soluble antioxidant in cell membranes. Its purpose is to protect membrane lipids from oxidative damage. Whether unequal affinity for different lipids optimizes the proximity of vitamin E to polyunsaturated phospholipids, the lipid species most susceptible to oxidation, is the question that we address with MD simulations on lipid bilayers. Our studies suggest cholesterol, ubiquitous in the cell membranes of animals, excludes vitamin E from saturated raft-like domains enriched in the sterol. Preferential affinity for polyunsaturated phospholipids is not indicated -vitamin E, like polyunsaturated phospholipids, is pushed towards non-raft regions depleted in cholesterol. The binding energy measured for vitamin E in umbrella sampling AA (all-atom) simulations is greater for SM (sphingomyelin) than SDPC (1-steroyl-2-docosahexaenoyl-sn-glycero-3-phosphocholine). Adding cholesterol to SM eliminates the differential in binding energy. CG (coarse-grained) simulations run on PDPC (1-palmitoyl-2-docosahexaenoyl-sn-glycero-3-phosphocholine) /SM/cholesterol mixtures in the presence of vitamin E indicate the vitamin locates at the boundary between SM-rich/sterol-rich (raft-like) and PDPC-rich/sterol-poor (non-raft) domains. The results of these studies will be presented.

Mentor: Stephen R. Wassall, Department of Physics, IUPUI

O37. Designing Food Preparation Technologies for Campus Food Insecurity

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One in every seven college students in the US are food insecure, struggling to regularly acquire food to meet their nutritional needs. Campus pantries help by providing food for students, however support is limited in assisting food preparation. As HCI practitioners, we seek to explore designs for recipe-based IT systems for students. In our study, we will produce designs for recipe-sharing through sketching and wire-framing. We will then conduct concept validations with key stakeholders, collecting feedback to help iterate further designs. Preliminary concept validations with our campus pantry explored a broad range of ideas in approaching college food insecurity. Doing this helped us focus our design space and awareness of factors impacting feasibility, from which we determined the sharing of recipes would be a beneficial direction to pursue in helping campus pantry users. Thus far, the feedback we have received points toward design avenues in recipe databases, grocery shopping assistants, and sharing recipes through social media. We also learned the importance of identifying campus policies which must be considered in implementation, as we had come across constraints in branding and permissions for sharing food. The insights produced from this study will help us point toward recommendations for designing future IT systems for campus pantry users and other services for low-income students. While pantries may vary in implemented systems and policies, we expect our recommendations can help inform those following similar avenues of food support or make supplementing additions to currently existing ones.

Mentor: Lynn Dombrowski, Department of Human-Centered Computing, Indiana University–Purdue University Indianapolis

P7. Analysis of me31BGene's Role in Stabilizing Drosophila Germline RNA and Me31B protein's RNA Binding Specificity

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Me31B is an important protein in Drosophila germ cell formation. It has homologous gene playing similar roles in human cells. Me31B plays a key role in the translational regulation of mRNAs in germline cells. A recent study has shown that Me31B gene or genes that interact with me31Blikely has an influence on RNA stability. To test this hypothesis, we used genetic crosses to generate different mutant fly lines to analyze representative germline mRNAs like oskRNA and nosmRNA. Reverse Transcription quantitative PCR was utilized to quantify the mRNAs in heterozygous me31Bflies and wild type control. However, results showed that there was no significant difference between the heterozygous strain and the control. We conclude that losing one copy of the me31Bgene was not able to produce a detectable RNA level change. Further research will involve using homozygous mutant flies in the hope that they will produce a detectable phenotype. In the same time, we show our proposal to analyze the RNA binding specificity of the Me31B protein by RNA immunoprecipitation and RNA sequencing. Understanding the species and quantify of RNAs bound by Me31B protein will provide more information on Me31B's RNA regulation role in Drosophila germ cell development.

Mentors; Ming Gao, Biology Department, Indiana University Northwest

O19. Willingness of Individuals to use Mental Health Services: The Impact of Knowledge and Perceptions

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The main purpose of this study is to examine how knowledge and perceptions of mental health will affect how individuals utilize mental health services. The importance of

this study is to raise awareness towards mental health services that are offered on and off campus. Individuals taking on new life challenges such as college, high course loads, unemployment, divorce, death, injury/illness, new ventures in family life, or even those with pre-existing conditions may need these services. Previous research on the study of college freshman reveal that due to lack of knowledge of the mental health system, many individuals will not utilize any mental health services. Research has also shown that due to the stigmatism, cultural background, lack of previous experiences/education, and lack of assistance from these services creates barriers that keep individuals from utilizing any form of mental health services. By approaching this issue, it will allow colleges and workplaces to implement a structured and easily accessible mental health service. This study is being conducted by using a Qualtrics survey to measure mental health knowledge/perception and the use of mental health services. This study anticipates that people with previous experience or knowledge of mental health disorders or treatment will have a higher willingness to use mental health services. This study also predicts that female individuals will have a more positive attitude towards mental health services than men, which would parallel to a higher use of mental health services for women.

Mentors: Todd Manson, Department of Psychology, IU Southeast

P31. The Overly Friendly Crockpot: Internet of Things Threat Modeling Analysis

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The concept of the "Internet of Things" (IoT) is no longer the stuff of science fiction but an essential part of the reality of our everyday lives. IoT refers all of the things we are putting in our house that talk to internet without direct human interactions. Connections made through IoT-enabled devices facilitated the rapid and efficient transfer of data needed to support a wide range of activities and operations. Even though smart things allow advanced services of a whole new kind, these useful features are also bringing privacy threats such as identification, location tracking, data capture, video feed, and access. Our research tests one IoT smart home device, a crockpot, to find out how safe these IoT devices are and the security flaws that could potentially be present in the devices in order to help protect people's privacy. We use threat modeling in the whole process which includes hacking the devices and exploring the components inside by taking the device apart. Our results reveal that hackers are able to have unauthorize access without the owner's approval and do harmful activities through the crockpot. We realized how much users don't think about how these devices can be very risky and bring privacy threats.

Mentors: Sameer Patil, Department of SPICE, IU School of Informatics, Computing, and Engineering; Joshua Streiff, Department of SPICE, IU School of Informatics, Computing, and Engineering

P44. Does Your Attachment to Your Pet Differ from Your Attachment to Your Partner?

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The purpose of this study is to examine the relationship between human attachment styles and human-pet attachment styles. Previous studies have found that relationships with pets have a similar structure to that of humans. Due to this relationship, humans tend to substitute human-human interactions with human-pet interactions. Data will be collected through an online survey on human attachment and human-pet attachment. The data collected will be used to determine whether or not there is a correlation between the two attachment styles. Of the three human attachment styles (secure, anxious, avoidant), it is expected that levels of avoidant human-human attachment will be more highly positively correlated with levels of anxious human-pet attachment. The results of this study will help in the understanding of human relationships and human-pet relationships.

Mentors: Todd Manson, Department of Psychology, IU Southeast

O40. Emotions and Fact: Using Language to Identify Fake News Articles

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Fake news articles generally contain many emotionally charged words intended to grab the reader's attention. Fake political news stories are often widely shared across social media and can influence what the public can think of candidates. This project is an introductory attempt to flag these inflammatory words and phrases in political fake news stories, with the idea that if they can be identified in a story electronically, before fake news stories become viral on social media, it might be possible to limit the amount of fake news that reaches a wider public. By examining multiple politically oriented fake news stories I identified clusters of attention-grabbing words that could be used to help detect these stories. Additionally, I discovered that many of these sites copy one another. Fake news, if they attempt to cite their sources, cite their own website in many cases. If these sites cannot find anything to help solidify their claims, however, they often copy text from other unreliable sources,

usually without citing. The inflammatory words used often target a specific political party and the words differ for each party. Most of the fake articles in this study include emotionally charged words that appear to be factual. By creating a way to flag stories that contain words such as these, it may encourage people to look further into the article before believing or re-posting it. The system to flag potential fake stories could then learn from itself and better at determining what is real and what is fake.

Mentors: KT Lowe, Indiana University East Campus Library

P15. Accounting for the Difference in Photochemistry of TpdA versus dApT

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Department of Chemistry, Indiana University East

Excessive exposure to ultraviolet radiation is associated with many different diseases such as skin cancer. These diseases can be attributed to harmful DNA photoproducts causing oxidation, mutagenesis and carcinogenesis as a result of excess electronic energy. Previous research has shown that when photoexcited thymidyl (3'-5')-2'-deoxyadenosine sodium salt (TpdA) forms the harmful photoproduct while it's isomer, 2'-deoxyadenylyl (3'-5')-thymidine (dApT), does not. We studied the conformational distributions of the DNA model compounds (TpdA) and (dApT), which were sampled using molecular dynamics in order to explain the significant difference between the photo reactivities of these two dinucleotides. Based on recent findings of the photochemical properties of both dinucleotides, it was hypothesized that dApT bases are rarely well stacked to account for the constraints on the radical ion pair limiting the formation of a photoproduct; in contrast, we expected to find TpdA dinucleotides to be more frequently stacked, which would allow for photoinduced electron transfer from the adenine base to the thymine base, ultimately leading to the formation of the TA* photoproduct. It was found that in both cases there were significantly fewer cases of well stacked bases in dApT as well as conformational differences, which supports the hypothesis. Having a better understanding of the conformation and development of photoproducts may be useful in the future to address treatments for cancers caused by photoproducts.

Mentors: Law, Yu Kay, Department of Chemistry, Indiana University East

P30. The Power of Music Therapy

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Music Therapy is a form of medical treatment which uses the various components of music such as song writing, instrument play, and music listening in a guided setting to treat or remedy an individual's personal issues. This research aims to analyze the dynamics of a typical music therapy session in order to uncover the levels at which music therapists connect or aid their patients as well as the areas in which technology can enhance the experience of a typical music therapy session. After interviewing 12 music therapist/music therapy patients, transcripts of the interviews were analyzed with the help of qualitative coding software. The results drawn from the codebook insisted that music therapists aid their patients through their specialized training and have unique forms of assessment for each patient. In this way, individuals must approach the field of music therapy with observance to the fact that the unconventional manner in which music therapy is performed can be essential in discovering a path of healing for patients. Technologies used within music therapy sessions can be as minimal or extensive as the patient requires, however the idea that this technology can be improved to better the facilitation of music therapy is eminent. In the field of Informatics, the assessment of which areas can be improved give way to an uprising of innovation for current music therapy practices specifically in the domains of music streaming services, video calling, and music therapy specific assessment platforms.

Mentors: Anna Bagilone, Department of EngineeringSystems and Environment, Universityof Virginia; Patrick C. Shih, Department of Informatics, School of Informatics, Computing, and Engineering, Indiana University Bloomington

P32. Cyber Security Competitions and Information Security Education: Gaps and transitions on the way from novice to expert

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Cybersecurity competitions have been shown to be an effective approach for promoting student engagement through active learning in cybersecurity. Players can gain hands-on experience in puzzle-based or capture-the-flag type tasks that promote learning. However, novice players with limited prior knowledge in cybersecurity usually found difficult to have a clue to solve a problem and get frustrated at the early stage. To enhance student engagement, it is important to study the experiences of novices to better understand their learning needs. To achieve this goal, we conducted a case study from the novice perspective, which involved eight undergraduate students who participated the National Cyber League (NCL) competition for the first time. Our objective was to identify the learning needs of novice players when tasked with utilizing cybersecurity concepts, tools, and practices. The study was conducted through questionnaires and in-person interviews. We examined the participation of players during one full NCL game season.

We collected the players' feedback on their experiences, learning challenges, and obstacles they encountered while participating. Results showed that, in an academic setting, the primary concern going into these competitions stemmed from a lack of knowledge regarding cybersecurity materials. Players that had an interest in cybersecurity demonstrated that they were able to quickly enhance performance through the conceptualization of various practices exhibited in the NCL. Our primary goal focuses on using the data collected during the study to adjust course materials that will cater to a student's learning curve and increase overall performance efficiently.

Mentors: Chen Zhong, Department of Informatics, IUK School of Informatics

P1. Existence and Self-Perception of Stereotypes at Indiana University

Rachel Desmarais
Department of Sociology; IU College of Arts and Sciences

This paper focuses on stereotypes on IU's Bloomington campus. I want to specifically know: which stereotypes exist at IU, why they originated, why they perpetuate, and if people who identify as the groups these stereotypes address also perceive themselves as applying to the stereotypes. Through survey of IU students as well as interviews, information will be gathered about how students identify, which stereotypes they believe in, and which they internalize. Interviews will hopefully give greater background on where these students learned these stereotypes and how they internalized them. The project has not begun yet, but I anticipate that students will believe in stereotypes about majors and involvement on campus quite frequently, but not see themselves as applying to these stereotypes. I am interested to see exactly how each point of view differs and how these results can help minimize implicit bias at my school. If people are aware of the stereotypes they internalize, they will hopefully intentionally try to not judge one another based on stereotypes but rather get to know each other first, creating a stronger and more welcoming community.

Mentors: Pamela Jackson, Department of Sociology, IU College of Arts and Sciences

036. Lift Me-A Motivational Application to Support Underrepresented Students in Informatics

Amanda Echegaray, Mathew Palakal, and Molly Morin, Department of Informatics, IU School of Informatics and Computing at IUPUI

Research suggests underrepresented minority (URM) college students including first-generation, low income, and women have a decreased persistence in completing a college degree in science, technology, engineering and mathematics (STEM). Recent research suggests that methods of traditional mentoring and new forms of mentoring such as e-mentoring have the potential to provide social support. Our present study seeks to explore the potential of e-mentoring to motivate and support the persistence of URM students in Informatics at IUPUI. Results from surveys and a focus group will be used to drive the design and development of the LiftMe application, a potential virtual mentoring support.

Mentors: Mathew Palakal, Department of Informatics, IU School of Informatics and Computing

P78. God Gave me You? A Study into the Correlation Between Religion and Relationship Satisfaction

Sarah K. Embrey and Sandy Helton
Psychology Department, School of Social Sciences, Indiana University Southeast

The topic of this study is to look at the correlation between religion and relationship satisfaction. The objective of this study is to see how important of a role religion is when looking at relationships and see if the couples identified religious beliefs, participation and spirituality play a part in their relationship satisfaction. To address this problem, we designed a survey consisting of religious identity, religious participation, and spirituality as well as rating relationship satisfaction. For these questions the participant will answer for both themselves and their significant other. From the results of this survey we will use a t-test to look at identified religion and relationship satisfaction and use a correlation to look at how religion, religious participation and spirituality all correlate with relationship satisfaction. For the outcome of this study, we predict that couples who identify, as the same religion will have higher relationship satisfaction than those who identify as different religions. Then our final prediction is that couples that identify as the same religion and have similar levels of spirituality will have higher relationship satisfaction than those who have different levels of spirituality. There are a few different ways this study and its results could affect not only psychology but also the world. This study has the potential to effect marriage counseling because if religion does play a role in relationship satisfaction it is important that marriage counselors acknowledge that and depending on the couple's beliefs have religion as a significant part of treatment.

Mentor: Todd Manson, Psychology Department, School or Social Sciences, Indiana University Southeast

034. How Your Personality Could Influence Your Workout and Reduce Stress

Hannah M. Embry Lauren Conklin
Department of Psychology, School of Social Sciences, Indiana University Southeast

Our current study on Personality, Exercise and Stress will examine the extent to which your personality, based on the

Big Five model of personality, determines the type of exercise routines you engage in as a way to reduce stress. We are interested in why some personality types are prone to high intensity workouts and why others are prone to low intensity or medium intensity workouts, as well as the amount of exercise certain personality types engage in compared to other personality types. After measuring the relationship between personality and exercise type, we are interested in looking at which personality types get the most stress reduction from their workout choice. The objective of this study is to find whether there is an optimal workout for each personality type as a means to reduce stress. We aim to bridge the gap of understanding on the impact personality and exercise can have on stress levels; which personalities need less or more exercise to reduce stress, which personalities are engaging in the right exercise for their personality (based on their stress levels and current exercise routines), and which personality types need to try another method of exercise. The method we are using are three quick and easy self-response questionnaires, one measuring personality, one measuring exercise type, and one measuring the participant's current stress levels.

Mentors: Deborah Finkel, Psychology, School of Social Sciences, Indiana University Southeast

P50. Factors That Influence the Way Job Applicants Are Seen: The Impact of Having Different Majors

Andrew Fields1
1Department of Psychology, IU School of Humanities and Social Sciences

The purpose of the research was to see if a person's major in college impacts can qualified others think they are for a management position. Many undergraduate students feel like they have to choose between studying a subject that they want to study and a subject that will allow them to find a job after college. Some information in the literature indicates that the type of degree obtained may not greatly impact the perceived abilities of a job applicant for management positions. Thus, an experiment was performed using a survey distributed by MTurk. Participants residing in the US read one of five vignettes about a recent college graduate named David; he is at a job interview for a management position with a customer service component. The independent variable was David's major; his major was either Business, Tourism, Psychology, Philosophy, or Communication. After reading one vignette, participants were asked about David and how participants perceived his punctuality, his leadership skills, his customer service abilities, and his problem-solving abilities. An ANOVA test was running, and no statistical difference was found comparing the results as a whole; two of statistical differences were found only when comparing tourism and philosophy. The ANOVA results suggest that the choice of major, at best, only had a small influence on the perceived abilities of the applicant. This suggests that that the choice of college major is not a large factor in how others perceive the general qualifications of a job applicant applying for business management positions.
Mentors: Vanessa Costello-Harris, Department of Psychology, IU School of Humanities and Social Sciences, IUK

O29. Vowels Are Like Dessert in Dominican Spanish: They Are Eaten at The End

Jaclyn E. Flores, Erik W. Willis
Department of Spanish & Portuguese, Indiana University College of Arts & Sciences

One of the most repeated characterizations of dialectal variation of segmental reduction in Latin America Spanish employs a culinary metaphor by describing that consonants are "eaten" or reduced/elided in the lowlands, and vowels are eaten in the Highlands. There is ample quantitative evidence to support the claim of reduction and elision of consonants in syllable final position as well as phrase final position in the lowlands of the Caribbean, particularly the Dominican Republic (Alba 1990, 2004). The obvious nature of investigated consonantal reduction, reaching almost categorical levels among certain populations, has perhaps caused research into vocalic reduction to be understudied. In reviewed sociolinguistic interviews of 20 speakers from Santiago, Dominican Republic we noted a consistent devoicing at the end of the utterance similar to what might be observed in the Andean region. Our preliminary acoustic analysis of data indicates that final devoicing is prevalent in the speech of Dominicans with limited education and indicates a trend of devoicing in syllables with a voiceless consonant. We argue that this devoicing reflects a progressive devoicing assimilation process triggered by the voicing status of preceding consonant(s). The data also encourage a reexamination of reduction processes generally associated with Caribbean Spanish since the vocalic reduction results in a fortition of the preceding consonant. The goal of this paper is to understand the extent and nature of this process as well as discuss the implications for Spanish phonology and sound change.

Mentors: Erik W. Willis, Department of Spanish & Portuguese, Indiana University College of Arts & Sciences, Indiana University Bloomington

P12. Phanerochate chrysosporium Desaturase, A Molecular Model forthe Oxidative Modification of Fatty Acids

Scott J. Foster, Pedro Sanchez, and Robert E. Minto
Department of Chemistry and Chemical Biology, IUPUI School of Science, Indiana University-Purdue University Indianapolis

The amino sequence of the 12 acyl phosphatidylcholine desaturase of the fungus Phanerochaete chrysophobia (PchDes) was threaded to existing protein folds via the

Phyre2 sever and contrasted to a recent crystal structure ofthe 9stearoyl-CoA mammalian desaturase solved crystal with the expectations to elucidate details concerning the structure and function of individual residues in the fungal active site. The aligned structures were visualized in the program Chimera to define mutations expected to force PchDes to perform 9desaturation. The 9stearoyl-CoA desaturations believed accomplished through the acyl chain being inserted into a tunnel-like active site where the stereo- and regio selective desaturase chemistry is accomplished through a conformation-limiting wedge. Mutations were installed on a plasmid construct containing the gene that encodes PchDes, a gene that encodes beta-lactamase for ampicillin resistance, and a gene that encodes uracil biosynthesis for yeast selection. Site-directed mutagenesis was carried out using a Quik ChangeII Site Directed Mutagenesis Kit of amino acid residues L293T, G134Q, and I347A.Plasmid amplification was successful in the transformation ofXL-1 Blue Escherichia colicells. The PchDes mutants were expressed in yeast and the fatty acid products were isolated and subsequently analyzed with a gas chromatograph-mass spectrometer (GC-MS).

Mentors: Robert E. Minto, Department of Chemistry and Chemical Biology, IUPUI School of Science, IUPUI

O43. Multicultural Science and Math Integrated in Social Studies through Cooperative Learning and Critical Thinking

Yazmyne Franklin
School of Education, Indiana University Southeast

The correlation between teaching multicultural education in math and science is important to show children in the United States more than the basic curriculum that has been taught previously. It is known that many underrepresented or minority groups have tradition of cooperation and critical thinking. Through using cooperative learning and critical thinking techniques new and interesting projects can be implemented in the classroom.

Mentors: James Hollenbeck, School of Education, IUS

P64. A Study of #Metoo, Rape Myth Acceptance and Belief in a Just World

Stefanie M. Fuller
Department of Psychology, Indiana University Kokomo

The purpose of this study was to investigate the relationship between the perceived effectiveness of the #metoo movement, rape myth acceptance and belief in a just world. Research has found that social movements can be powerful, so it is important to examine how this movement is playing a role in society. Recently, the #metoo movement has increased conversation surrounding sexual assault. However, little research has been performed on the effects of the #metoo movement on sexual assault survivors. To investigate these factors, we collected survey data using Amazon Mechanical Turk targeted towards two groups: people with a history of sexual assault and people without this history. In this survey we included the Illinois Rape Myth Acceptance Scale, Belief in a Just World Scale and questions on participants 'perception of the #metoo movement. One-way ANOVAs were performed and found that there were no significant differences between the two-group son any of these measures. One possibility for these results is that the exposure to the #metoo movement has aided in lower acceptance of rape myths. Further analysis will be done to examine how gender plays a role in each group, as well as exploring participants' open-ended responses to questions about #metoo.

Mentors: Kathryn M. Holcomb Department of Psychology, Indiana University Kokomo

P70. Emotional Intelligence

[1]**Haley Funkhouser** and 2 Zach Saunders
1 Department of Psychology, Indiana University Southeast;
2 Department of Psychology, Indiana University Southeast

This study examines the relationship between emotional intelligence and family structures. Emotional intelligence is the ability to manage and recognize emotions. Past research has indicated that family has an impact on emotional intelligence. Emotional intelligence is important to mental health and social relationships. Participants will complete the 16-item emotional intelligence questionnaire as well as some questions which as about demographics and family structure. We expect the results to demonstrate that women have a higher emotional intelligence compared to men. We also expect that people whose biological parents are married will have a higher emotional intelligence. These results may also indicate that nuclear family environment increases emotional intelligence. Implications of the data will be discussed in terms of how it can be used to develop emotional intelligence.

Donna Dahlgren, Department of Psychology, IUS School of Psychology

P1. Nitrate and Nitrite Content of Beetroot Juice Products Marketed to Athletes

Edgar J. Gallardo1, Andrew R. Coggan1,2Departments of Kinesiology1 and Cellular and Integrative Physiology 2Indiana University Purdue University of Indianapolis

Introduction: The consumption of beet juice has become particularly popular among athletes, due to the fact that dietary nitrate has been shown to enhance exercise capacity. This has resulted in many companies creating and marketing beet-based products to meet consumer demand. Depending on growing conditions, however, the nitrate content of beets can vary significantly. This makes it difficult for athletes to know how much nitrate they are

actually ingesting. PURPOSE: To determine the quantity of nitrate (and nitrite) present in beet juice products marketed towards, or easily available to, athletes.
METHOD: Samples from 45 different lots of 24 different beet juice products produced by 21 different companies were purchased locally or via the internet. After reconstituting (if necessary) and diluting each sample 1000x in water, nitrate and nitrite concentrations were measured using a dedicated high-performance liquid chromatography system. The amount of nitrate and nitrite per serving was then calculated based on the measured concentrations and either 1) the manufacturer's recommended serving size (for prepackaged/single dose products) or 2) a volume of 500 mL (for beet juice sold in bulk containers). RESULTS: There was moderate-to- large variability in nitrate content between samples of the same product, with a mean coefficient of variation of 30±26% (range 2 to 83%). However, there was even greater variability between products, with nearly a 50-fold range in nitrate content between the lowest (0.4 mmol/serving) and highest (18.8 mmol/serving). The amount of nitrite in all products was very low (i.e., ≤0.5% compared to nitrate), except for two that contained 10 and 14%. Over half of the products contained less nitrate (or nitrite) per serving than appears necessary to enhance exercise capacity in most individuals. CONCLUSION: The present results may be useful to athletes or coaches contemplating which (if any) beet juice product to utilize. These data may also offer some insight into variability in the literature with the respect to the effects of beet juice on exercise performance.

Mentors: Andrew R. Coggan, Departments of Kinesiology and Integrative Physiology, Indiana University Purdue University of Indianapolis

P75. The Role of Movement in Social Perception

Isaac M. Garcia Rojas1, Mark Jaime11 Psychology, Department of Science, IUPUC

This study examines the role of movement in the formation of social perceptions. We argue that pure kinematic data, that is, movement data that is devoid of other social cues such as facial features, gender, age, race, etc., is sufficient for the formation of social perceptions. The primary goal of this study is to introduce the idea of social kinematics, which is to say that movement by itself is enough for individuals to form social perceptions. Current research has studied a similar notion, but considering other social factors, primarily eye gaze. A secondary goal is to gather general information so that further research may be encouraged regarding this topic. This research is of most importance because it may open social kinematics as new area of research in the field of cognitive neuroscience. In addition, this study could provide the foundations for moving away from subjective diagnostic tests, currently used to diagnose a wide range of mental disorders. To address the question at hand, 60 students from both IUPUC and IU Bloomington are being recruited to gather experimental data. The procedure consists of 2 experiments. For the first experiment, 30 of the students will be given a questionnaire that taps into social processing domains as well as features of the broad autism phenotype (BAP). After completing the questionnaire, subjects will be asked to carry out a set of predetermined movements in front of a Microsoft Kinect, which is a non-invasive motion tracking system. The data collected by the Kinect will be in the form of point light display videos, which allow for the analysis of pure movement patterns. In the second experiment (N=30), participants will be asked to make a numerical rating on a 7-point scale that represents a dimension along a personality and/or social trait, based on the point light display videos obtained in the first experiment. Results are yet to be determined, as the study is still in progress. It is being carried out at the IUPUC Early Sensory Experiences Lab, as well as at the Developmental Cognitive Neuroscience Lab located in Bloomington.

Mentors: Mark Jaime, Psychology, Department of Science, IUPUC

P42. Approaches to Confronting Racial Bias

Adriana Gonzalez- Tigre, Mary Murphy1, Katie Kroeper1, and Elinam Ladzekopo1
Psychological and Brain Sciences, Indiana University-Bloomington, College of Arts and Sciences

This study examined the types of messages people use to confront prejudice, specifically the strategies used behind the confrontation. Participants were exposed to blatant examples of homophobia and racism and given an opportunity to confront the bias, express agreement with the bias, or remain silent. Researchers qualitatively coded written responses, specifically looking for participants pointing out the prejudice, expressing disagreement, or pointing out logical flaws in the perpetrator's argument. Analyzing the manners in which people handled confrontation differently, their verbal mannerisms such as confrontation skills and argument development. The purpose of this research is to see which types of confrontation messages are most common; which will then serve to empirically examine whether these common strategies effectively reduce prejudiced attitudes and decrease stereotyping.

Mentors: Mary Murphy, Katie Kroeper, and Elinam Ladzekopo

O10. Studying Recruitment of Me31Bin Drosophila Germ Plasm

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1Biology Department, Indiana University Northwest

The protein Me31B mediates germ cell development via the formation of a special cytoplasm, germ plasm. Me31B interaction with other proteins is essential for germplasm

formation. Previous studies have led to believe that Me31B may co-localize with Osk protein (the germ plasm inducer). Therefore, we hypothesize that Osk may recruit Me31B into the germ plasm. To test the hypothesis, we collected Drosophila embryos and stained them with fluorescent anti-Me31B, anti-Osk, and anti-Vas antibodies. We observed the embryos under a confocal microscope and found similar localization patterns of Me31B in OR (wildtype control) and osk-bcd 3'UTR transgenic strain. In the osk-bcd 3'UTRstrain, Osk and Vas ectopically localize at the anterior end of early-stage embryos but the localization of Me31B was not affected. To conclude, our study showed that Me31B independently agglomerated at the germ plasm of early embryos, and this localization is independent of Osk or Vas protein.

Mentor: Ming Gao, Biology Department, Indiana University Northwest

O6. Testing of 12-Lipoxygenase Inhibitors Using Zebrafish Pancreas Development

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Center for Diabetes and Metabolic Diseases, Indiana University School of Medicine

Islet β-cell dysfunction and death are characteristic of type 1 diabetes (T1D) and type 2 diabetes (T2D). In islet β cells, 12-lipoxygenase (12-LOX) catalyzes the production of proinflammatory lipids and lipid peroxides. Increased inflammation, macrophage activity, and oxidative stress contribute to β-cell dysfunction and eventual death. Therefore, inhibition of 12-LOX with a small molecule drug can provide a potential treatment for T1D and T2D. Products of 12-LOX such as 12-HETE may contribute to zebrafish embryo organogenesis, so inhibition of 12-LOX would result in a small pancreas phenotype. Therefore, small molecule inhibitors such as ML127, ML351, and ML355 were tested on transgenic green fluorescent protein-expressing zebrafish embryos (ptf1a: GFP) using pancreas size as a visual screen for drug effectiveness. About 15-20 zebrafish embryos were incubated in various concentrations of ML127, ML351, ML355, and combination ML351/ML355, as well as in 1-phenyl-2-thiourea (PTU), and dimethyl sulfoxide (DMSO) starting at varying ages. The embryos were imaged on a Zeiss LSM700 confocal microscope and the length of each pancreas was measured. Treatment with 10 μM ML127, combination 40 μM ML351/40 μM ML355, and 10μM, 20μM, and 40μM ML351 showed a significant decrease in pancreas length. We conclude that zebrafish embryos can be used to test 12-LOX inhibitors, and that therapeutic inhibition of the lipoxygenase pathway can potentially reduce the amount of oxidative stress experienced by β cells, therefore slowing or halting the progression of diabetes.

Mentors: Marimar Hernandez-Perez, Sarah A. Tersey

P71. Yoopers to Y'all": A study on dialect perception in the state of Indiana

Caitlynn Hale

Sociolinguistics is the study of perceptual dialect variation and how it influences individuals within society. The current study investigated variations of dialect perceptions in Indiana. Data was collected in north and south Indiana, with respondents indicating on a blank map of Indiana "where they thought English was spoken differently". Respondents also labeled the areas. Results: Individuals from the south used words with negative connotations such as "informal" or "hick" to describe their dialect, where as those in the north used words with a positive connotation such as "high class" or "proper" to describe their dialect. Individuals from the south used positive words to describe the north such as "formal" or "educated". These responses could indicate that those from the south have a negative perception of their own dialect which have sociocultural implications.

P45. The Influence of Music Intensity on Creative Problem Solving.

Brittany L. Harris1 and Anthony J. Smith1
1Indiana University Southeast Social Sciences Department

Creative thinking is a quality that is crucial for the advancement of civilization and the demand for new products, ideas, and solutions to problems; however, innovation is also stunting the inquisitive nature of recent generations making them more short-sighted and less intellectually apt to develop creative thought. Scientific research has suggested that music can enhance creative cognition, more specifically 'happy' music facilitates divergent thinking, a type of lateral problem solving where one generates multiple solutions to a given issue or problem. It is contrasted by convergent thinking, which involves following guidelines to arrive at one fixed solution. Prior research has typically investigated the impact of classical music upon cognition, but with ever-expanding genres of music arising, classical music is less common. The current study is to examine the influence of music intensity on divergent and convergent thinking, using high and low intensity instrumental pieces of music and a silent control. High-intensity music is expected to enhance divergent creativity, low-intensity music is expected to enhance convergent creativity, and both types of music are expected to enhance creativity compared to the control group who has no musical intervention. The ability to find creative solutions is essential for all aspects of life, and an inexpensive, easily accessible means of enhancing creative thinking can be utilized in various academic, social, cultural, and organizational environments.

Mentors: Dr. Deborah Finkel, Indiana University Southeast Social Sciences Department

P27. Following the Fakeness: Tracing the Path of False Information

Renee Harshbarger, Joseph Pickard and
M. Abdullah Canbaz
School of Sciences, IU Kokomo

Today's media is under considerable scrutiny when it comes to the topic of false information as the concept of either badly sourced or deliberately incorrect information has made its rounds in a big way via Internet, what we have come to label "Fake News". This irrepressible spread emerged in big importance as such a split being produced in every single source of communication, it became challenging to classify the correctness of the information. Moreover, the number and rate of eyes that can reach a story has significantly increased with in the past decade in the wake of online social networks (OSNs) such as Facebook or Twitter. In this project, we have developed a conceptual frame work in which we identify not the deceitful article per se, but the path an article takes in its proliferation online. This is accomplished via first, gathering data from both OSN's and websites of notice with the use of our own data crawler framework. After harvesting data from both OSNs and various webpages (such as News Channels), we conduct deep network and sentiment analysis.

Mentors: M. Abdullah Canbaz, School of Sciences, IU Kokomo

P21. A History of Bloodletting and its Modern Applications

Houston B. Hart
Department of Social Sciences, IU School of Education

The purpose of this case study is to introduce the reader to the concept of bloodletting and its practice. This study will educate the reader regarding the history of bloodletting, its modern applications, and its impact on current medical science. The information gathered has come from relevant written academic sources. The interest in this subject material lies within the perfect blend of historical influence as well as a study of the sciences combined to educate and entertain. The conclusion of this study will build on the possible futures of this practice utilizing data gathered on the modern application of this historical yet controversial medicine.

Mentors: James E. Hollenbeck, IU School of Education

P39. To What Extent Will the Throughfall Displacement Experiment (TDE) Simulate an Artificial Soil Moisture Reduction?

Kathryn F. Hart
Indiana University School of Public and Environmental Affairs

Little is known about how water and carbon cycling in trees change along with changes in the atmosphere. With climate change intensifying, drastic changes in ecosystem demographics are imminent. This project tested the effectiveness of a throughfall displacement experiment (TDE) to simulate an artificial soil moisture reduction. In the later stages of research this 'drought' will be used to monitor changes in water and carbon cycling in trees. Soil moisture percentage, temperature and respiration were monitored to assess the effects of the TDE. It can be concluded that the TDE was successful in lower soil moisture, thus it has the potential to simulate a drought.

Mentors: Glenia Pena-Lugo, Indiana University School of Public and Environmental Affairs; Kim Novick, Indiana University School of Public and Environmental Affairs

O31. Vaccination and Preventative Public Health

Mallory J. Hatcher
Department of Secondary Education, IUS School of Education

The role of this case study is to show the significance of vaccinations on society and public health. Concerns about the anti-vaccination will be addressed and their dangers will be exposed.

Mentors: James E. Hollenbeck, Department of Secondary Education IUS School of Education, IUS

O28. Rules, Rules Rules: How Laws Governing the Ballot Process Influence Political Efficacy

Serena Hawkins, Aaron Dusso
1 Department of Political Science, IUPUI School of Liberal Arts

The relationship between direct democracy and political efficacy has been fraught with conflicting research. We argue that this is due to many studies ignoring the effect of barriers to the direct democracy process. To provide clearer data, we use state laws to sort ANES respondents into three categories that gage the difficulty associated with the ballot initiative process. As hypothesized, we find that respondents who are in states that have a relatively simple ballot initiative processes have higher levels of political efficacy than those in states without a ballot initiative process. Interestingly though, we found that respondents in states with a difficult ballot initiative process have on average lower levels of political efficacy than those respondents in both states without a ballot initiative process and states with a simple process.

Mentors: Aaron Dusso, Department of Political Science, IUPUI School of Liberal Arts

O20. Brain Music

Samantha Heidlage
Indiana University Southeast Education Program

In my Case study, I will be researching how music affects the brain. I hope to learn more about how music affects human. I hope to learn how listening to certain songs or certain genres can change a mood. I want to answer many questions that I have about music. Can listening to music help mental illness? Does playing certain music to babies, like Mozart, affect them? Does music affect the way people view social and political ideas? How has music affected history? Music affects different people in different ways and this case study will provide answers to these questions.

Mentors: Dr. James Hollenbeck

P48. Next Step in the Feeding Minds Project: Survey to Assess Food Insecurity on Indiana University Regional Campuses

Autumn Hockenbury1, Michael Foley2, Victoria Morales3, Jamie Huntsman Coulter4
1Department of Psychology, IUS School of Social Sciences; 2Department of Political Science, U of L College and Arts and Sciences; 3Department of Psychology, IUN College of Arts and Sciences; 4Department

The main purpose of this grassroots, student-led project is to discover ways to counter student food insecurity on regional campuses and in nearby communities. IU Southeast received a grant for The Regional Campuses of Indiana University Grand Challenges Initiative with the goals of making Indiana healthier and smarter. The problem addressed by this research is primarily reducing and understanding food insecurity of college students, which ranges from 14-59% in the United States. An important reason to address this issue is to mitigate the negative effects food insecurity has on academic success, as well as to promote the general health and well-being of college students and local residents. Initial methods have involved interviewing members of the community to explore existing resources and potential solutions to help combat student and community food insecurity through asset mapping. In addition to interviewing, we have utilized Qualtrics to survey campus community members at all five IU regional campuses to obtain a baseline percentage of those challenged by food insecurity. To increase response rates, we also asked sponsors of specific organizations and departments on campuses to send targeted emails to their given groups. Survey responses have provided insight into the specific challenges of each campus, while simultaneously providing a platform to investigate innovative ways of making food accessible to campus community members. This work can serve as a model for other regional campus efforts to overcome college food insecurity.

Mentors: Jenny Fisher, Department of Biology, School of Natural Sciences, IUNW; Melanie Hughes, Library, IUS

P2. The Effect of Childhood Emotional Abuse on Adult Romantic Relationship Satisfaction, Infidelity, and Promiscuity

Kelly A. Howard1 and Cierra K. Williams1
1Department of Psychology, IU Southeast School of Social Sciences

Prior research has thoroughly studied the effects of childhood physical abuse and later romantic functioning, but emotional abuse has been surprisingly understudied in psychological assessments. This study aims to lessen this gap of research and solely focus on aspects of emotional abuse survivors and their later romantic relationship attachments. An anonymous, online survey, created with Qualtrics, will be administered to participants through the use of the social media site Facebook, through the use of an IU Southeast subject pool for Psychology students, and through CANVAS for any other possible subjects to participate. Specially, this study will analyze whether individuals with a history of childhood emotional abuse partake in more sexual partners than those without a history of abuse, whether those with a history of abuse have higher rates of infidelity, and if these individuals will have lower rates of romantic satisfaction than their non-abused counterparts. This study will contribute to the gap of research on childhood emotional abuse, and will demonstrate the importance of including this type of abuse in future studies.

Mentors: Todd Manson, Department of Psychology, IU Southeast School of Social Sciences, IU Southeast

O7. Genetically Modified Foods, a Health Concern, or Health Answer

Sean T. Hurt
Department of Education, Indiana University Southeast

Have today's scientists found the answer to the problems that the food industry is facing today? With food expiring quicker than people can eat it. Can genetically modified foods be the result for a healthier future for the people on earth, or are they too harmful for people to ingest? In the year of 2018, many food allergies are affecting everyday people and children, gluten, peanut butter, dairy, etc. are just a few examples. However, G.M. O's are foods that have been created to make food healthier. Studies from the University of Harvard, showed effects on not only the participants, but the offspring of said participants. These studies were done properly and show fantastic results. Due to evidence proven, this research can be used to show significant results for the use of genetically modified foods. It shows what genetically modified foods do to the body after digestion and if they are healthy. This work will provide the necessary information needed for not only myself, but

my fellow colleagues, to know the true facts and figures of genetically modified foods. As they do not cause harm, but are a healthier solution to the organic and artificial foods that many people consume on a daily basis.

Mentor: James Hollenbeck, Department of Education, Indiana University Southeast, New Albany, IN

O18. Exploring the Relationship Between Stress and Mental Health for Black Pre-Health Students

George Patrick J. Hutchins
Department of Sociology, Indiana University

A well-established literature demonstrates the association between social stress and mental health. The stressors students encounter during their pursuit of higher education on college campuses are often augmented for some by the added requirements of being on a "pre-health" track. The pressure to perform well on rigorous standardized tests, excel academically, and produce a broad portfolio of extra and co-curricular activities can have significant impacts on a student's levels of stress, which can then increase their likelihood of negative mental health outcomes. Moreover, being a black student in the university system can bring about its own unique set of challenges, pertaining to race, that can potentially exacerbate this stress-mental health pathway. The aim of this study is to examine the association between race, stress, and mental health among a group of pre-health students. To explore this issue, students identified as having a pre-health concentration by the Health Professions and Pre-Law Center (HPPLC) will be contacted and administered a multi-item survey composed of questions from the Perceived Stress Scale, Kessler-6, and Clance Imposter scale. Data will be analyzed using ordinary least squares regression. Further understanding of the factors that represent a unique stress experience among pre-health students has implications for the success and likelihood of career persistence for this group.

Mentor: 1Pamela B. Jackson; Department of Sociology, Indiana University

O24. Can Human Interaction Affect the Presence of Antibiotic Resistance in the Wild Primate Microbiome?

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Anthropogenic interaction with ecosystems has a wide variety of consequences, including changes in animal behavior and a shifting diversity of resistance genes. Microbial resistance to modern antibiotics may originate from anthropogenic selective pressure; these resist types can subsequently be dispersed or arise in wildlife populations via antibiotic pollutants, spillover events, bacterial translocation, and transfer of mobile resistance genes. Animal behavior around humans may facilitate these events. Given this, sampling the abundance and diversity of resist types and recording behavioral data of wildlife populations may allow researchers to determine the dispersal of the resistance genes, determine health risks associated with reservoirs, and draw correlations with sites where resistance may have originated. In this study of Costa Rican primates, fecal culture methods were used to determine the presence of resistant bacteria in wild populations of mantled howler monkeys (Alouatta palliata), white-faced capuchins (Cebus capucinus), and Geoffroy's spider monkeys (Ateles geoffroyi). Seven clinically relevant antibiotics representing five classes were tested (aminoglycosides, penicillin's, macrolides, fluoroquinolones, and tetracyclines). Scan-sampling behavioral data was also collected from primate groups. Fecal samples were collected non-invasively and opportunistically throughout Costa Rica over a 10-week period. GPS coordinates were recorded at the location of each sample and spatial analyses were used to locate potential sources of resistance near the primates. This project is currently being expanded to Kibale National Park, Uganda, to allow for further comparisons across phylogeny, dietary niche, and geographic range. It is possible that resistance and behaviors correlate with proximity to human settlement, agriculture, or abiotic dispersal factors. Identifying such areas will help improve both non-human primate and human health.

Mentor: Michael D. Wasserman, Department of Anthropology, Indiana University Bloomington

P19. Optical and Photoelectrochemical Studies on FTO /Polyterthiophene in Aqueous Electrolytes.

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Polyterthiophene (PTTh)/ FTO (Tin Oxide-Fluorine doped glass electrode) interfaces were created using oxidative electro polymerization from acetonitrile electrolyte containing 5mM of the monomer and 0.2M LiClO4. The FTO/PTTh interfaces were subjected to photoelectrochemical investigation in aqueous acetate, citrate, and phosphate electrolytes. We studied the changes in the photocurrent generation as an indicator for this assembly's ability to cause the photoinduced charge separation. Further electrochemical impedance spectroscopy (EIS) studies were used to investigate changes in electrical properties, such as dielectric constant and electrical conductivity. The optical parameters such as the optical conductivity (σ opt.), optical absorption coefficient (α), refractive index (n), real (εr), and imaginary (εi) dielectric constants were also investigated.

P40. Medical Experiments and Ethics in the Holocaust

Eryn N. Jochim
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Discussion on the gruesome experiments used within the Holocaust death camps and their impact on human right guidelines throughout the world. With these experiments' men, women, and children were targets, and under some leadership twins were sought out. The basis of the research includes Joseph Mengele and his methods of his testing. Concurrently, my research will illustrate the impacts of hyperthermia and genetic experiments, which will lead to the establishment of new guidelines and ethics for medical testing and experiments. The conclusion will highlight the outcomes, along with policy that has changed following the Holocaust.

Mentors: James Hollenbeck, Department of Secondary Education, School of Education, IU Southeast

P26. User-Generated Success: Estimating the Determinants of Total Video Views on YouTube

Craig A. Johnson, Jr
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The internet has eliminated the entry barriers to many markets through the emergence and growth of platforms for hosting user-generated content. With this expansion, new barriers have been introduced as platform adoption causes an exponential increase in available content which makes it harder for individuals to stand out. This research attempts to estimate the factors that determine users' success on online platforms through the lens of YouTube. YouTube illustrates both how individuals can prosper in these environments and how companies respond to the expansion of user-based technologies. To evaluate success, total video views are used as the primary indicator for each user's channel. Regression analysis is conducted using data collected by Social Blade, a social media analytics company, for the top 250 YouTube channels in 16 different channel types. A variety of independent variables are examined including a channel's total subscribers, total video uploads, number of years on the platform, and the channel category. The results of this study provide a clearer understanding of the determinants for user success and what biases are present on YouTube. It further provides a foundation for advertisers, individuals seeking to create content, and other entities to perform future analysis on supply and demand to assess potential viewership, revenues, and costs.

Mentors: Hong Zhuang, Department of Economics, Judd Leighton School of Business and Economics, IUSB

O4. Read My Lips: The impact of Lip Color on First Impressions of Photographs

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First impressions are a known phenomenon in social science today. We make quick judgements on one another based on appearance that could impact how we perceive the personality of our counterparts. This study tested if the first impression made on one's personality can be changed by simple manipulations of the outer appearance. A total of about 100 participants were given the Big Five Inventory-10 to test their own personality traits: extraversion, neuroticism, conscientiousness, openness to experience, and agreeableness. Next, they were given eight different photographs in a random order; four photographs of female 1, and four photographs of female 2. Each set of four contained different colors of lipstick (pink, red, black, and blue). The participants then made ratings on the Big Five Inventory-10 regarding their first impressions of the individuals in the photographs. They also rated the photographs on attractiveness, professionalism, aggressiveness, confidence, creativity, lifestyle, and perceived religious tendencies. We expect to find differences in perceived personality traits based on the differences in lip color.

Mentors: Deborah Finkel, Psychology Department of Social Sciences Indiana University Southeast

O39. Detection of Anti-Patterns in Program Code Using Semantic Web Technologies

Sameer Karali
1Department of Informatics & Computer Science, IU Kokomo

Anti-Patterns are commonly observed in the software industry, which are ineffective solutions to a problem due to the lack of knowledge of the developers. These anti-patterns usually disrupt the development and maintenance activities of programs because they usually make it difficult to understand the source code. Therefore, it is necessary to detect and correct anti-patterns in the early stages of software development and maintenance process. Most of the existing methods use logic rules for anti-pattern detection. The rule-based methods are not good at detecting some common anti-patterns, such as God Class, Swiss Army Knife and Functional Decomposition, because the rules are not flexible enough to detect the variances in the source code. In this paper, we propose a novel method that uses semantic data of the source code to detect anti-patterns. In our approach, we aim to provide flexibility, such that anti-patterns are specified externally using ontology formalism. We use an ontology model that includes a source code representation ontology (SCRO)and ontology sub-model to detect the individual anti-patterns. After defining

SCRO and the anti-patterns ontologies, for each design pattern, we define SWRL rules that formally describe the pattern's structure and behavior. The rules are automatically imported into the depot for the framework in question. We utilize a domain-independent OWL-DL reasoner that is capable of computing entailments form the set of facts and SWRL rules defined in the ontologies. In the future, we will investigate the possible tool extensions to support the detection of anti-patterns.

Mentors: Chen Zhong and Awny Alnusair, Department of Informatics & Computer Science, IU Kokomo

P13. Formation of Acetals and Ketals from Carbonyl Compounds: A new and Highly Efficient Method Inspired by Palladium

Brenda Martinez, **Tyler Kindoll**, Shawn Green and Enoch A. Mensah
Department of Physical Science. Indiana University Southeast

A new and highly efficient method inspired by palladium for masking carbonyl groups as acetals and ketals is described. The method relies of the capability of palladium catalyst to activate carbonyl functional groups. This method requires low catalyst loading and has been extended to a variety of different carbonyl compounds to form the corresponding acetals and ketals in excellent yields.

Mentors: Enoch A. Mensah

P53. Expression and purification of putative alkaline proteases from Halobacillussp. BBL2006 genes in Bacillus subtilis

John Klem[1], Belinda Petri1, and Gretchen Kirchner
1Department of Biology, IUS

Each discovery of a novel enzyme provides new tools for controlled and specific chemical reactions. Our lab has been attempting to isolate a proteolytic enzyme, observed in Halobacillussp. BBL2006, which functions ideally under the extreme conditions of high alkalinity and high salt concentrations. We have identified several candidate genes in silicousing NCBI BLAST and by comparing domain homology. Several of these genes have been targeted with PCR, inserted into the pUSH2 vector by restriction enzyme cloning, and transformed into E. coli for amplification. After amplification, the vector will be transformed into Bacillus subtilis for protein expression and then later purified using nickel spin columns. The limited cut-sites of pUSH2 and the presence of required cut-sites within the genes of interest necessitated the use of additional techniques, including site-directed mutagenesis and partial digestion of the inserts. These complications lengthened the time required to finish the project. We anticipate that after completion we will have an isolated and purified enzyme that exhibits the same observed proteolytic activity under extreme conditions. Discovering the gene which encodes for this enzyme would add to the characterization of the genome of Halobacillussp. BBL2006 as well as provide a novel enzyme with potential for scientific and industrial use.

Mentor: Gretchen Kirchner, Department of Biology, School of Natural Sciences, IUS

P8. Role of Antibiotics and control of disease

Corey Lagle
James Hollenbeck, School of Education, Indiana University Southeast

I want this research project to be an examination of antibiotics and the fight against disease. Sources that I will uses will be data bases such as Access Medicine, Medline, and Academic Search Premier. Other sources I may use could include the CDC, WHO, Cleveland Clinic, and even Web MD. The purpose of this research is to explore a little history of antibiotics while seeing the everyday fight medical professionals have trying to combat things such as antibiotic resistance. The research is also to look at how pharmaceutical companies are keeping up with antibiotics. This research presentation will contribute by informing people of the struggles and issues with antibiotics. While challenging potential medical professionals and scientists to look for more ways to make antibiotics succeed. This research has helped to inform me of how medical professionals are facing issues like antibiotic resistance from the fact of medications being over prescribed. With this happening it led pharmaceutical companies having to deal with antibiotic resistant diseases. The question that will ask be asked at the beginning of the research is What is the role of the development of antibiotics in the control of infectious diseases and the slow response by pharmaceutical companies in developing advance antibiotics."

Mentors: James Hollenbeck

P20. The Voice Behind the Vote: Mechanisms of Political Efficacy in Latino/a Youth

Mary Lechner
Department of Sociology, Indiana University College of Arts and Sciences

The Hispanic population is the largest minority group in the United States, and it has a growing impact on politics. Latino/a youth in the U.S, specifically, will greatly influence political outcomes in the coming elections. U.S-born Latino/a youth account for the largest segment of the Hispanic population. Between now and 2030, an increase of 23.7 million Hispanics will become eligible to vote. This will account for 40% of total growth in the eligible electorate; therefore, more attention should be paid to how and why Latino/a youth participate in politics. Previous research has provided quantitative data on the factors

influencing political participation among Hispanic immigrants and Latino/as in the U.S. This research study will take a qualitative approach to examine the mechanisms behind how Latino/a youth understand the political process and how they develop political efficacy. Drawing on data from 50 in-depth interviews from Latino/as between the ages of18-22, this study will seek to explore attitudes towards political participation. This study has implications for ways in which young, eligible Latino/a voters engage in the political process, and how they can better develop confidence in themselves and the government which represents them.

Mentors: Professor Pamela Jackson, Department of Sociology, Indiana University

P63. The Evolutionary Effect of Microphallus in Freshwater Snails

Nicole Leon Duran
Indiana University, College of Arts and Sciences, Stem Summer Research Program

Asexual females hold a two-fold advantage over sexual female snails; all else-equal, asexual females reproduce twice as quickly. How then do sexually reproducing organisms exist when asexual females can easily dominate the population? We are seeking to answer this question by testing the Red Queen Hypothesis which states that the common clone in a population will be more infected allowing the persistence of the sexual female population. We determined the sex and infection of the snail Potamopyrgus antipodarum through dissection, and reproductive mode of females through Flow Cytometry. We had hypothesized that the asexual snails, overall, would be more infected. Looking at the results it was concluded that overall the sexual females were more infected. Studying the snail's ability to coevolve in the ever-changing environment is important not only because the rate of evolution is key to the persistence of sexual and asexual snails but also the snail's ability to outpace the infection Microplallus and continue its lineage in the ever-changing environment.

Mentors: Kurt Lively, Zoe Dinges, Department of Biology

P76. Can Robotic Companion Animals Reduce Stress in College Students?

Sydney E. Lossin and Kearstin O'Daniel
Department of Psychology, Indiana University Southeast

The use of animals in therapy has been studied frequently, but social robotics in the western world still remains mainly untouched. The use of social robotic animals and stuffed animals is thought to have beneficial properties and may reduce stress. College student population has been widely overlooked for social robotics, most of the research involving companion animals focuses on atypical persons, the elderly, and children. The current study will expose college students to a robotic animal companion or a stuffed animal for five minutes and then measure their stress levels. Should our hypothesis be supported it could open the door to social robotics in mental health counseling, which is slowly becoming more accepted and utilized.

Mentors; Dr. Donna Dahlgren, Professor of Psychology

P49. Human and Robot Interaction with Prisoner's Dilemma

Anh Luu, Marlena Fraune Ph.D., Kyrie Jig Amon, Tyler Moon, Janet Oluwayomi
Department of Psychological and Brain Sciences, I.U. College of Arts and Sciences; R-House Lab, School of Informatics, Computing, and Engineering.

Robots will integrate into our society as working parts of companies and other systems. Due to this, they will become an important part of human life as it increases our efficiency and productivity or simply for entertainments, thus it is important to understand how the human mind perceive robots and their attitudes and behaviors that will arise from interactions with it. Our experiment will focus on multiple humans and robots interacting together, we have two conditions: one robot and three robots. The two will interact through the game of Prisoner's Dilemma. However, we will be using the Wizard of Oz technique to manipulate the perception of the robot as autonomous. We then collect data through surveys of human emotions and, using the behavior of humans recorded in the laboratory, we code it to support further data. We believe that regardless of whether the human participants are paired to interact with one robot or multiple robots, the human group will still be overly competitive against the other side because they consider the robots as an out-group. From our results, we have found that humans are more competitive against Three Robots than One Robot.

Mentors: Marlena Fraune Ph.D., Department of Psychological and Brain Sciences, I.U. School of Arts and Sciences

P10. Generation of luciferase-tagged ovarian cancer cell line for mice studies

Mary Makanjuola and Dr. Yuliya Klymenko (Mentor), Cancer Research

Ovarian cancer has the highest mortality rate and the lowest survival rate within cancers of a female reproductive system. It is a type of cancer that begins in the ovary or fallopian tube. The objective of the current project is to generate a luciferase-tagged ovarian cancer cell line for subsequent mouse studies. The workflow starts with wild-type OVCAR3 cells, the cells are then transduced with luciferase:dtomato plasmid, creating a mixed population. The mixed population is sorted via fluorescence-activated cell sorting to select for a pure transduced luciferase-

expressing cell population for the subsequent mouse studies conducted under different chemotherapeutic treatment regimens.

P79. The Relationship Between Grief and Music Therapy

Saul Martinez

Grief is an experience that everyone deals with in their lifetime. If not treated properly grief can transform into complicated grief which is a more intense form of grief that lasts longer than six months and hinders the client from interacting normally in society. A form of therapy used to combat this experience is music therapy. Music therapy is a relatively newer form of therapy that utilizes several techniques such as songwriting, singing, or musical related activities. This study aims to identify constraints and issues that are prevalent in music therapy specifically for the treatment of grief. For this study participants chosen were either a music therapist or a patient who has received music therapy. Numerous qualitative interviews were conducted to determine the effectiveness of these sessions and which problems continued to reoccur throughout the sessions. Once we gather our data and analyze the results we will incorporate methods that utilize technology to better aid their therapy sessions.

P62. Septic Systems as a Potential Source of Microbial Contamination to Indiana Waterways

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Septic systems could pose a threat to the water quality of Northwest Indiana because of the potential to introduce fecal pollution and pathogens. This project sought to identify areas with fecal microbial contamination where septic systems may be the source. High numbers of fecal coliforms and/or E. coli can indicate the presence of human pathogens. Dunes Creek and Trail Creek, which both pass through areas of high septic use, were sampled on 2 and 3 separate occasions respectively. Samples were collected throughout the summer at multiple locations. Water samples were tested for fecal coliforms using m-FC agar plates. Colilert was used to determine the amount of E. coli. Two replicates of DNA were also collected for future tests. Our data showed that 69% of Trail Creek samples and 75% of Dunes Creek samples exceeded the state Recreational Water Quality Criteria for full body contact (235 CFU E. coli/100 ML.) This data suggests there may be a chronic water quality issue and septic systems may be the cause. Future work will include tracking the source of the contamination using -qPCR for human markers on DNA samples and would allow for the problem to potentially be addressed. Identifying the risks associated with septic system use may help to encourage usage changes that lead to a lower amount of pollutants in surface waters.

Mentors: Jenny C. Fisher, Department of Biology, IU College of Arts and Sciences, IUN

O21. A Comparative Analysis ofMe31B Protein Complexes in Drosophila Ovary and Embryo

Aidan McCambridge1 and Ming Gao
Biology Department, Indiana University Northwest

Me31B, an ATP-dependent RNA helicase, is an essential protein for germ cell development in Drosophila melanogaster (fruit fly). Me31B complexes with other proteins and RNAs to form germ granules, which determine germ cell formation. Understanding how Me31B interacts with other molecules can determineMe31B'seffecton the germ granules' functions. Furthermore, comparing Me31B's interactome from oogenesis to embryogenesis provides a timeline of its role in germ cell development. To analyze the interactome, an in vivo proteomics analysis was conducted on Me31B-GFP expressing fly embryos. The Me31B complexes were chemically crosslinked and isolated from the embryos. Then, the complex components were identified by mass spectrometry. When comparing the embryo Me31B interactome to the interactome of the ovaries, we discovered the dynamics of Me31B in germ granules in different developmental stages (egg to early embryo), which suggests a changing role of Me31B during germ cell development.

Mentors: Ming Gao, Biology Department, Indiana University Northwest

P56. Effect of Nicotine on Streptococcus mutans Binding to Collagen

Courtney McGrew[1] and Richard L. Gregory, PhD2

Streptococcus mutans is a cariogenic bacterial species because it can bind to connective proteins in the oral cavity and produce lactic acid which demineralizes enamel surfaces. This characteristic of S. mutants is heightened in the presence of nicotine due to an increase in growth on tooth surfaces and upregulation of virulence genes. In addition, oral bacteria can enter the bloodstream many ways. Once oral bacteria, specifically those with the capability to bind to connective proteins, like S. mutants, enter the bloodstream, they can bind to connective proteins, such as collagen, produced by and found on the extracellular membranes of endothelial cells in the blood vessel walls and begin to colonize. These colonies can be the initiation of arterial plaque formation, leading to hardening of the blood vessels, which can further develop into atherosclerosis. This study examined biofilm growth of several strains with known genotypes for collagen binding in various concentrations of nicotine using crystal violet staining as well as collagen biofilm binding in various concentrations of nicotine using an ELISA method. There is a statistically significant increase ($p<0.05$) in S. mutans

biofilm growth and biofilm binding to collagen in the presence of nicotine concentrations in most strains from nicotine concentrations 2 to 16 mg/mL. This supports previous findings that nicotine increases S. mutans biofilm growth. It also supports our theory that there should be an increase in collagen binding if there is an increase in biofilm growth, and thus could lead to an increased risk of atherosclerosis in nicotine consumers.

Mentors: Dr. Richard L. Gregory, Department of Biomedical and Applied Sciences, IU School of Dentistry, IUPUI

P24. Japan: More in Africa Than We Think

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Africa has long been known to possess vast natural resources which many foreign powers have tried to access. Japan is one of those foreign powers who despite the industrialization of their country still possess a significant lack of natural resources. Therefore, causing them to become interested in tapping into Africa's riches to ensure the prosperity of their country. This research looks at resource poor Japan's strategy in engaging with resource rich, Africa in a manner that is mutually beneficial for both parties. The goal is to that overtime Japan has become a significant player within Africa. This research draws upon literature on the past when Japan improved its public image/diplomacy with Africa, their change from a commensalism to mutualism approach, and their current hands on approach of controlling the distribution of their money. Upon examination, it is clear that Japan has grown into a bigger contributor in Africa. This will allow for more attention to be drawn to whether Japan's involvement in Africa will become a model for other international entities to follow.

Mentors: Darrell Brown, Kelley School of Business

P47. Examining the Influence of Learning Method on Symbol Recognition

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The ability to recognize shapes and symbols underlies the foundation for success in the current educational system. The development of effective techniques to aid in learning thus demands an understanding of how people distinguish between symbols and depends on research that explores the influence of both the static and dynamic characteristics of letters and symbols on recognition. This study focused on how the method, specifically the stroke order, in which a symbol is learned impacts recognition. Children were randomly assigned to either an experimental or control group; the experimental group was taught to draw symbols in a particular stroke order while the control group was not constrained to a specific stroke order. Both groups were then evaluated on their ability to distinguish between learned symbols and unlearned symbols presented in both learned and unlearned stroke orders. The preliminary results indicate that within the experimental group, children recognized learned symbols shown in the learned stroke order with slightly higher accuracy than those shown in an unlearned order, suggesting that they recognized the order in which they learned the symbols. However, the control group showed a slightly, but not significantly, higher overall accuracy in distinguishing between learned and unlearned symbols, suggesting that forcing a particular stroke order hinders recognition when a symbol is shown in variable stroke orders. Whether or not stroke order is shown to influence recognition, the results of this study will offer factors for consideration by which educators could facilitate the learning and recognition of letters.

Mentors: Karin H. James, Department of Psychological and Brain Sciences, Indiana University

P61. Sex and Age Effects on Cerebral Amyloid Angiopathy and Intracerebral Hemorrhage

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Intracerebral hemorrhage (ICH) is a debilitating injury characterized by the rupturing of a cranial blood vessel and subsequent bleeding into surrounding brain tissue. Cerebral amyloid angiopathy (CAA), sex, and age have been shown to be independently associated with ICH severity and outcomes. CAA is a disease of the vessels of the leptomeninges and cerebral cortex characterized by deposits of protein β-amyloid on the vessel walls and can lead to cortical bleeding and other cerebrovascular diseases. Until now, the combined effects of sex and age on CAA and ICH presentations have remained virtually unexplored. We sought to determine how sex and age are associated with CAA and ICH pathophysiology. Markers indicative of CAA were identified on baseline MRIs of 39 primary ICH patients. Univariate analyses were run to determine significant relationships between sex, age, each CAA marker, and ICH characteristics. In males, we found younger age is associated with deep hemorrhages and IVH, while older age is associated with lobar hemorrhages and cSS. In younger populations, male sex is associated with a higher chance of having deep hemorrhages, and female sex is associated with higher30-day mortality. In older populations, smoking was associated with male sex, but no significant mortality or ICH differences were found between sexes. There is an association between old age and CAA with differences found exclusively within the same sex, indicating a possible progression of disease with age. Overall, this research may lead to more treatment options

and preventative measures appropriate for the patient's sex and age.

Mentors: Ashley D. Blatsioris

O32. Early American Medicine and How It Affected Public Health.

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There is no doubt that American medicine has changed throughout the years and not only changed but tremendously progressed. Early Americans did not have the public healthcare or access to medicine that Americans have now. When someone was sick there were not many options to help them and when a disease hit the community, there was no way to stop it front spreading. Medicine was far from advanced and people explored on their own to find remedies to help cure the sick. Vaccinations did not exist, and cures were not common in early American time. People were infected and sometimes that meant it was a death sentence because there was no way to know if there was cure. This case study will explore the idea of vaccinations and how it eventually came about and what that did to the public health.

Mentor: Dr. James Hollenbeck

O35. Depressor Tone Shift in SiSwati

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Across languages, voiced consonants tend to lower the pitch of the following vowel. In some tonal languages, this universal tendency manifests in the phonological system as a class of depressor consonants which lower the tone of the following vowel. This research analyzes the phenomenon of depressor tone shift in siSwati, a Bantu language of the Nguni subgroup. This is a process in which high tones are shifted to the following syllable due to the presence of a depressor consonant. Analyses of this process have mostly been limited to its application within words. The goal of this research is to compare depressor tone shift in siSwati to the same process in isiZulu and examine how it operates across word boundaries. This research provides insight into the relationship between tone and segmental phonology, elucidating the ways in which tone functions in Nguni languages and the broader Bantu family. Data were collected via elicitation sessions with a native speaker of siSwati. Words were recorded, and tone was transcribed with the help of the computer program Praat. The results show that the process of depressor tone shift is essentially the same in siSwati and isiZulu. Further, depressor tone shift can operate across word boundaries after final vowels are deleted. Unexpectedly, a high tone originating on the final vowel of a word is unable to shift. The results of this study help to refine the analysis of Nguni tonology, providing much needed data on the application of tonal processes across word boundaries.

Mentors: Malgorzata Cavar, Department of Linguistics, College of Arts and Sciences, Indiana University; Antonia Schleicher, African Studies Program, School of Global and International Studies, Indiana University

P74. How Gender Affects the Gaining of Confidence and Knowledge When Doing Sociological Research.

Rebekah M. Morgan, Stephanie Medley-Rath
Indiana University Kokomo, Department of Sociology

This study identifies the relationship between gender and their confidence and knowledge doing sociological research among undergraduates. All students in upper level sociology courses were invited to complete a survey measuring their confidence, knowledge, and experience conducting sociological research. It was hypothesized that men will be more knowledgeable and confident than women when conducting sociological research. I used SPSS to run frequencies and cross-tab correlations. This study could contribute to the field of teaching sociology and teaching research methods and allow us to potentially see a pattern in the students' confidence and knowledge by looking at the demographic factor of the students' gender when doing sociological research.

Mentor: Stephanie Medley-Rath, Department of Sociology, Indiana University Kokomo

P23. The Transcontinental Railway and American Economic Growth

Samantha L. Mullins
Secondary Education, IUS School of Education

The following paper will analyze how the railroad system in the United States impacted American economic growth. The transcontinental railway revolutionized travel in the nineteenth century when it brought America's two coasts closer together, making travel and trade easier. Through research databases, it was determined that the transcontinental railway not only united a country but had a profound effect on economic development in the United States. By analyzing how the transcontinental railway influenced economic growth in the United States one can better understand U.S. economic development.

Mentors: James Hollenbeck, Secondary Education, IUS School of Education

P72. "Give Me a Break": Political Party and In-group Bias in Attributions of Risky Decision Makers

Thomas Myers1, Janelle Sherman1, and Ed Hirt1
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Although previous research has shown that conservatives tend to make more internal attributions while judging others, no study to date has examined whether in-group status moderates this effect. The purpose of this study was to test whether Republicans are unitive toward everyone due to their belief in free will (consistent with previous studies) or if they are less punitive toward other Republicans due to in-group bias. In this study, participants were asked to complete a measure of political party and then were randomly assigned to receive a resume of a chairperson who was either a Democratic or Republican. Participants were then given a scenario where this chairperson made a decision that ended poorly and were asked to complete several measures of internal attributions of the chairperson. Consistent with the free will belief hypothesis, Republicans made internal attributions regardless of in-group status. Unexpectedly, Democrats showed an in-group bias, making less internal attributions for the Democratic relative to the Republican chairperson.

Mentors: Janelle Sherman, Department of Psychological and Brain Sciences, IU College of Arts and Sciences

O14. How Do Leonardo da Vinci's Blueprints Relate to Modern Inventions?

Taylor Myers
Department of Secondary Education, IUS School of Education

I intend to investigate Leonardo da Vinci's various blueprints of concepts such as the parachute, tank, and flying machine and compare their mechanics to modern inventions such as the modern versions of the parachute, tank, and airplane. I then intend to discover the differences between Leonardo's ideas and the modern inventions we have today and whether or not Leonardo da Vinci inspired the creators of these inventions.

Mentors: James E. Hollenbeck, Department of Secondary Education, IUS School of Education, IUS

P11. Engineering a Fluorescent Biosensor for the Detection of Herbicide Glyphosate

Pierre-Emmanuel N'Guetta1 and Shahir Rizk1
1Department of Chemistry and Biochemistry, Indiana University South Bend

Glyphosate is the active ingredient in the herbicide Roundup and is used to kill weeds. Nowadays, glyphosate is the most popular herbicide used around the globe. It has been classified as a probable carcinogen. Several states are planning to restrict its use. Hence, there is a need for the development of detection methods for GP. The E. coli phosphonate binding protein naturally binds to GP, making it a good candidate for the development of a glyphosate fluorescent biosensor. This happen with a very low affinity limiting PhnD ability to detect low concentrations of GP. Our goal is to increase the affinity of PhnD for glyphosate. PhnD undergoes a conformational change upon binding to its ligand. We can take advantage of this conformational change to develop PhnD into a fluorescent sensor for glyphosate, where a fluorescent reporter group is attached to PhnD. In this work, we introduced a mutation in the binding pocket of PhnD (E177N) that improved affinity by 100-fold. We also sought to take advantage of the equilibrium property by engineering antibody fragments that bind specifically to the closed form of PhnD. We utilized engineered antibody fragments (Fabs) to improve the affinity for GP. The Fabs were designed to stabilize the bound form of PhnD. Five Fabs were tested, one was found to increase affinity of GP to PND by an additional 10-fold. The combined effect of the mutation and the Fab result in a 1000-fold affinity enhancement, allowing the development of sensitive biosensors for GP pollution.

Mentors: Shahir Rizk, Department of Chemistry and Biochemistry, Indiana University South Bend

P43. Restaurant Tipping Behavior Study

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Tipping in restaurants acts a primary source of income for many waiters and waitresses. Therefore, it is important to understand the factors that are likely to increase tipping behaviors among patrons. In the current study, positive and negative vignettes were used to measure satisfaction with server, service quality, and tip size. The sample consisted of 300 United States citizens gathered using Amazon Mechanical Turk (MTurk). A one-way ANOVA was run to evaluate the relationship between positive and negative vignettes and server attentiveness, service quality, and tip size. A second one-way ANOVA was run to evaluate whether prior serving experience affected satisfaction with server, server quality, and tip size. Participants who received the positive vignette were more likely to rate their server and service quality as being more satisfactory and leave larger tips. However, patrons with prior server experience did not rate their server and service quality differently compared to patrons without server experience; they did leave statistically larger tip sizes. Therefore, satisfaction with servers and service quality are likely to affect tip sizes left for waiters and waitresses. Thus, servers may be able to manipulate their service quality delivered to patrons to entice a larger tip.

Mentors: Kathryn Holcomb, Department of Psychology, Indiana University–Kokomo

P69. Scent and Mood: Evaluating the Placebo Effect

Rachel Needham1, Nicole Curtis-Davis
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Essential oils sell a scent that advertises the smell leads to a relaxed state. The current study will test this claim. Past research has indicated that some ingredients do lead to some level of relaxation. Some research also indicates no effect or a placebo effect. The smell blend used in the study is advertised to induce relaxation. We are testing whether the actual smell leads to relaxation or if the label which describes the relaxation leads to the mood change. Participants in our study were all exposed to the same smell, but with three different labels. One label is the "sleepyze" group, one group got the "mood-energizer label" and one group got the smell with no information. We were interested how the label affected the moods you might select during the smell evaluation portion of the survey. We also might find that the smell has no impact on mood change. The conclusion of this study will determine if the smell, the placebo effect or the label induces the sense of relaxation.

Mentors: Donna Dahlgren, Department of Psychology, School of Social Science, Indiana University Southeast

P41. Effect of GMOs on National Agricultural Economies and Rural Quality of Life

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The purpose of this study is to evaluate the relationship between the use of GMOs and their impact on agricultural economies and rural quality of life. The term GMO (genetically-modified organisms) is most commonly referred to plants created for human or animal consumption through biological enhancement.

Mentor: James E. Hollenbeck, IU Southeast School of Education

P4. Alpha-Blocking Stress Away: Determining the Effects of Prazosin on Stress Responses in Zebrafish (Danio rerio)

Michael P. O'Daniel, Harold E. Olivey, and Maureen L Petrunich-Rutherford
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The formation and maintenance of Post-Traumatic Stress Disorder (PTSD) symptoms are heavily regulated by adrenergic hormones, such as adrenaline and noradrenaline. Today, there are limited efficacious treatment options for PTSD, although there has been promise found in medications involved in blocking adrenergic hormone receptors. While there have been many studies indicating the efficacy of prazosin (an α-1 adrenergic receptor blocker) in the treatment of PTSD symptoms, no studies have fully elucidated mechanisms behind its efficacy. The use of zebrafish (Danio rerio) has been growing in popularity, in part, due to the homology of the stress response system with mammals. Zebrafish, when exposed to chronic unpredictable stress (CUS), exhibit similar symptoms as humans afflicted by PTSD. Zebrafish when exposed to CUS show an increased trend toward anxiety-like behavior in the novel tank test and a decrease in basal levels of cortisol. Additionally, the zebrafish model will be used to determine underlying mechanistic effects of prazosin on behavioral and biological changes induced by CUS. Specifically, this study will elucidate the effects of prazosin on CUS-induced changes in brain levels of genes involved with regulating stress such as pro-opiomelanocortin (POMC), glucocorticoid receptors (GR), and corticotropin-releasing hormone (CRH).

Mentor: Maureen L. Petrunich-Rutherford

P28. Seeing the unseen for Society's Betterment: Measuring the IoT Privacy and Security

KeeJoh O'Hearon, Michael Mckee, and Nathan McDaniel, and Muhammed Abdullah Canbaz School of Sciences, Indiana University Kokomo

Every second, a large amount of data is exponentially generated through various means, such as web, mobile devices, scientific instruments, computer simulations, and many other methods; and then mined to obtain valuable information. On the other hand, spread of use of the smart devices, more generally the Internet of Things, with no question expanded the complexity tremendously. While industry focused on deploying more devices to the market every day, focus on privacy and security has not received enough attention. Our research is aimed at collecting, mapping, and interpreting data obtained from IoT to find possible policy implementations and privacy protection mechanisms. To this end, we first focus on implementing a structural testing framework for the IoT devices in various fields such as smart households, health and energy. Next, we fake the activities tracked by these devices to see the fractions of data flows and try to identify the patterns. Finally, we implement policies and privacy measures on these patterns to observe the mitigation differences from the previous observations.

Mentors: Muhammed Abdullah Canbaz, School of Sciences, Indiana University Kokomo

P60. It's a Matter of Taste: Edible and Competitive Ability if Native vs. Invasive Plants in Urban Woodlands

Fiyinfoluwa Olaniyi

Biological invasions are the second largest cause of biodiversity loss, biodiversity is known as the variety of life in a certain habitat or ecosystem (Keane and Crawley 2002). An invasive plant is a plant species that enters a new area and outcompetes the natives plant leaving behind its natural enemies such as herbivores behind. By outcompeting the natives, invasive plant species reduce overall plant diversity (Dozier 2001). Native plants are important to both humans and the food web, because they provide many ecosystem services such as health benefits and recreational spaces (Jim 2011). The purpose of this research is to see how well edible vs. inedible native species compete against an invasive plant species. It is important to know what types of native plant can survive being planted in a forest with invasive and herbivores. Two different experiments are being conducted, one is in a greenhouse and one in the field. The greenhouse experiment compares the competitive ability of two natives, calico aster(palatable) and lady fern(unpalatable) against the invasive species purples wintercreeper. The field project studies the competitive ability of the two natives, zig-zag goldenrod (palatable) and the lady fern(unpalatable) against the invasive species English Bluebell. The field experiment looks at how herbivory affects these species and how they compete. We found evidence that suggests competition between the invasive plants and natives in the greenhouse project.

Mentor: Savannah Bennett

O25. Me31B's Role in mRNA Regulation in Drosophila Ovarian Tissue

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Me31B protein plays a role in RNA regulation in germ cell development by interacting with RNA translation repressor and degrader proteins during egg development. Functional Me31B causes translational repression of germline RNAs like osk, nos, and bcd mRNAs. Recent studies have strongly suggested that Me31B plays a conserved role in post-transcriptional RNA regulation, likely by influencing RNA stability. However, whether Me31B causes the breakdown of germ granule RNAs during egg development is not quite yet clear. In order to investigate this, we performed RT-PCR to quantify representative germline RNAs such as me31B, osk, nos, and bcd mRNA in heterozygous flies: me31BΔ1/+, me31BΔ1/tral1 flies, and me31BΔ1/cup16. We observed significant RNA level decrease in cup homozygous mutants but no significant changes in the RNA level in the trans-heterozygous mutants. We conclude that Me31B and its interacting partner protein Cup functions in stabilizing RNAs in Drosophila germ cells.

Mentor: Ming Gao, Department of Biology, Indiana University Northwest

P58. Seasonal Phenology Associated Polymorphism in the CLOCK Gene

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Every year animals synchronize the timing of their phenology such as migration, reproduction and adjust the period of biological rhythms to match the changing photoperiod. Migratory birds that breed up north breed later in the spring while, the resident birds breed earlier in the year. The CLOCK gene polymorphism has been studied extensively correlating bird phenology such as migration and reproduction. The poly-Q allele polymorphism in the CLOCK gene is consistent in both migrate and resident's birds' phenological traits, which makes it captivating to study how it affects the breeding strategy of resident and migrant sub-populations of the Dark-eyed Junco. We caught resident and migrant Juncos during spring overwintering at Mountain Lake Banding Station (MLBS), Virginia. We plugged 10th primary feather and measured hydrogen isotope using mass-spectrometry to get an estimate of breeding latitude. Blood samples from the wing vein were collected and processed to extract the genomic DNA. The gene-specific PCR was run to amplify the clock gene and the amplified product was sequenced to look at the genetic variation. We hypothesize that migrants breeding far north will show differences in the Clkpoly Q allele length compared to residents that breed and stay on the same ground all year round.

Mentors: Devraj Singh, Department of Biology, Indiana University-Bloomington; Adam M. Fudickar, Department of Biology, Indiana University-Bloomington

P17. Optimization of Electrochemical Reduction of CO2using Gold Nanoparticle Catalysts

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Carbon dioxide, which is known as a greenhouse gas, is necessary to maintain the temperature of the earth atmosphere due to its high heat capacity. Recently, the atmospheric CO2emission has increased because of the rapid industrialization and population growth. The excess amount of CO2induces greenhouse effect, which further causes global warming. Global warming has drawn increasing attention because it causes the natural disasters around the world. Electrochemical CO2reduction aims to utilize CO2 as an abundant carbon source by on verting from CO2to useful carbon products, such as syngas or

liquid fuel. For the efficient electrochemical system, numerous electrocatalysts have been developed. Therefore, proper report of the inherent catalytic activity of the catalysts is becoming more important to evaluate their performances. The inherent catalytic activity of the catalysts can only be compared under the condition without any external factor that can affect its catalysis. In this research, the effect of contamination from metal impurities in the electrolyte and oxidized anode material was investigated. Gold nanoparticles were utilized as the catalysts to covert from CO2to carbon monoxide (CO). Removal of the possible contaminants enhanced stability and selectivity toward electrochemical CO2reduction reaction.

Mentor: Soojin Jeong, Department of Chemistry, IU The College of Arts and Sciences; Xingchen Ye, Department of Chemistry, IU The College of Arts and Sciences

O30. British Policy in the Baltic during the Great Northern War

Ben Parnin
IU Bloomington History Department

The purpose of this research is to explore the reaction and polices of Great Britain in the Baltic during the time period of the Great Northern War. Furthermore, to understand how and why the British policies and attitude in the Baltic changed over the course of the war. This area of research is important because is show the attitude of a non-Baltic state of the on-going politics. This shows other European states viewed the war that was engulfing Northern Europe and how the war was impacting their diplomatic polices and society. Since I was researching The Great Northern War impaction British policy most of my sources came from the British Domestic and Foreign Calendars from the reign of Queen Anne and the reign of King George I. Other sources include newspapers, Acts of Parliament, and merchant letters. What I have learned from my research is that Britain's primary concern about the Great Northern War was economical. When looking at the diplomatic polices Britain enacted in the Baltic region the vast majority are gear towards protecting the trade of vital naval stores. As a result of these finding I conclude the diplomatic polices that Britain employed against Sweden shows how Britain viewed the Baltic as an economical provider of a vital resource that was a necessary resource in their national defense and in maintaining their sea dominance. With limited research on this period of history, my research it gives more insight into how the Great Northern War impacted other societies.

Mentor: Cara Caddoo, Department of Histoy,IU

P52. Correlation Between Sleep Paralysis and Anxiety Disorders

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This research is being done to identify the potential relationship between Sleep Paralysis (SP) and anxiety disorders (Generalized Anxiety Disorder [GAD] and Social Anxiety). This research will serve to bridge the gap in knowledge about this phenomenon that leaves sufferers completely paralyzed upon waking or falling asleep, sometimes accompanied by intense feelings of fear and hallucinations. These goals will be accomplished by way of self-report questionnaire surveys to confirm the presence and intensity of SP and anxiety in participants. Researchers believe that there will be a positive correlation between SP and both anxiety disorders. It is also believed that those in college will have higher rates of SP and anxiety than those in other demographics, and that women will have higher rates of SP and anxiety than men.

Mentors: Todd Manson, Department of Psychology, IU Southeast

P33. Tracing and Learning the Cognitive Process of Cybersecurity Analysts

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Department of Informatics, School of Science, Indiana University of Kokomo

Cybersecurity analysts are playing an essential role for helping detect and prevent cyber threats in an organization's network. The responsibility of the analysts is to make sense of the network data to detect potential attacks. The data are generated by various cyber defense technologies which are deployed to monitor the network events, such as logs and alerts. Making sense of the massive data depends a great deal on a manual process which may include heavy workloads and requires highly background knowledge and experience. To better understand analysts' work, we use a tracing software to record an analyst's data analysis operations and develop a method for analyzing the analysts' cognitive processes captured in the traces. 29 traces were collected from 30 professional analysts in an experiment and analyzed with three tasks in mind: (1) identifying the effective data filtering operations and critical hypotheses made by the analysts, (2) reasoning about the strategies used by the analysts in detecting suspicious events, (3) comparing the differences among the analysts regarding the data analysis strategies. We have discovered that the analysts' tendency to err depends on their experience and domain knowledge. Besides, the analysts use various information processing and reasoning strategies. For example, some rely more on intuition while others on deliberation. The results of our trace analysis demonstrate that the traces contain rich Information about the analysts' cognitive process and domain knowledge. It is

feasible to extract useful knowledge from the traces to develop automated systems to assist cybersecurity analysts.

Mentors: Chen Zhong, Department of Informatics, IU Kokomo

P34. A Recommendation System for Facilitating Cyber Security Data Analysis

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A Security Operations Center (SOC) is a department composed of various cybersecurity technologies and security analysts with the goal of monitoring network activities and detecting attacks. Multiple monitoring data sources usually are collected in SOCs, such as firewall logs and Intrusion Detection System (IDS) alerts. With these sources, analysts of all levels of expertise need to conduct data triage analysis to identify potential attacks. Data triage is a process of identifying suspicious network events in the data sources in real time. It is a challenging task for analysts, especially for novices without sufficient expertise. The main challenge comes from the massive volume of data collected from a network of a large scope. Analysts need to make quick decisions based on their experience. Besides this, senior analysts also must take time to help novices rather than handle their own tasks, which may cause issues such as longer response times and anxiety for novices. To assist novice analysts, we developed a recommendation system that traces the data triage operations performed by experts and utilizes traces to make suggestions to novices when they come up with a similar situation. We have collected the traces of experts' data triage operations in a previous experiment. Given these traces, we use graphs to represent the traces and develop a similarity-based algorithm to compare the graphs in order to generate recommendations. We implemented and measured the system output according to the relevance. The results are positive for both automation test and human interaction feedback.

Mentors: Chen Zhong, Department of Informatics, School of Science, Indiana University Kokomo

P3. Vocation, Personality, and Linguistic Expression

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Linguistic study has shown more than the ability to acquire a second language; it has been used to uncover an aspect of the phenotypic expression of personality. Our personality is an assemblage of our environment, our experiences, and our biology. It is within this smattering of ingredients we develop preferences such as vocation and uniquely express ourselves. For this experiment, currently enrolled college students were asked to fill out a personality survey and then asked to construct a story with a distinct beginning, middle, and end referring to a Thematic Apperception Test photograph provided. Analysis will be running to evaluate the correlation between personality and vocation to a variety of linguistic aspects through the Linguistic Inquire Word Count. Additional correlation analysis will look at personality and linguistic expression. Finally, ANOVA will assess the relationship between vocation and personality. In this study, it is anticipated that the correlation between personality and linguistic expression will be found as well as vocation and personality. The novel idea of vocation influencing linguistic expression will be evaluated to be added to the literature on linguistics.

Mentors: Todd Manson, Department of Psychology, School of Social Sciences, Indiana University Southeast.

P59. Effect of Garlic Mustard (an Invasive Plant) on Survival and Mycorrhizal Fungal Abundance in Hydrophyllum appendiculatum (a Native Understory Plant)

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Hydrophyllum appendiculatum, a native understory plant, has declined from 13.9 ± 12.2 plants (mean ± stdev) per 10 m transect in 2003 to 3.7 ± 5.7 plants in 2018 in St. Patrick's County Park, St. Joseph County, Indiana. Alliaria petiolata (garlic mustard) is a common invasive plant in Northern Indiana. We tested two hypotheses regarding whether garlic mustard is contributing to the decline of H. appendiculate (HA). First, we tested whether presence of garlic mustard affects HA survival. First-year HA were grown in the greenhouse under one of three treatments: garlic mustard in pot with HA, 0.001 mM of allyl isothiocyanate (secondary compound from GM) added once per week to pot, or no GM exposure. HA survival was significantly lower with GM present (mean 44%), but there was no difference in survival between allyl isothiocyanate and control treatments (means 68% and 73% respectively; $F_{2,42} = 5.3$, $P = 0.008$). Previous studies have shown that GM can reduce mycorrhizal spore abundance. We compared mycorrhizal abundance in HA roots collected from forests with and without GM. There was no difference in mycorrhizal abundance in HA roots (forest with GM 24.1% ± 19.2% and forest without GM 22.0% ± 25.7% of roots with mycorrhizal hyphae; $T = 0.37$, $df = 60$, $P = 0.71$). These results did not support our predictions, as we expected to see more mycorrhizae in areas without garlic mustard. However, the greenhouse experiment suggests that the presence of garlic mustard could be reducing survival of first-year H. appendiculate.

Deborah Marr, Department of Biological Sciences, Indiana University South Bend

O8. Development of Antimicrobial Peptides Bactericidal to Multidrug-resistant Gram-negative Bacteria

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Antimicrobial peptides (AMPs) hold promise as alternatives to antibiotics as the world enters a "Post-antibiotic era". These molecules are short chains of amino-acids ranging from 5 to 50, and act as part of the innate immune system in all life forms. One activity of some antimicrobial peptides is to prevent bacterial infections. We seek to engineer AMPs from the cathelicid in class of antimicrobial activity to be especially effective against Gram-negative bacteria, especially drug-resistant Enterobacteriaceae. In this research, I designed and characterized the properties of several variants of the AMPs for efficacy against Gram-negative bacteria and for reduced cytotoxicity in animals. Chemical modifications were added to the peptides to improve their stability. A Minimal Inhibitory Concentration (MIC) was used to quantify the concentrations of peptides needed to kill Gram-positive and Gram-negative bacteria. The peptides were found to have low micromolar MICs against Gram-negative bacteria and several fold higher MICs for Gram-positive bacteria. The peptides have rapid bactericidal activity against Gram-negative bacteria. The most effective peptides were able to kill Klebsiella pneumoniae that are resistant to carbapenems and colistin, two of the last resort antibiotics that are in use. These results are informative for ways to improve the efficacy of these peptides and provide lead molecules to assess efficacy in infected animals.

Mentor: C. Cheng Kao, Department of Molecular & Cellular Biochemistry, College of Arts and Sciences

O12. The Dark Extremities of Opaque Duality: Love, Fantasy, and a thirst for blood as manifested in "The Metamorphosis of the Vampire" by Charles Baudelaire

Sydney Raynor
Indiana University Northwest

Charles Baudelaire changed the face of modern-day poetry. However, his life and work were not without controversy as he had several poems banned. Released in 1945, one of these banned poems, titled "Les Metamorphoses du Vampire", explores the subject of vampires with a rich usage of metaphors and allegories. Although the poem focuses on the grim, macabre creatures of the night, I argue that the vampire of which Baudelaire speaks of is a true depiction of Jeanne Duval. Duval was a beautiful mulatto temptress from Haiti who was Baudelaire's lover for years and was also featured in within much of his written work. Similar to vampires thirst-quenching desire for blood, the relationship between these two was upheld by Duval's alluring enchantment over Baudelaire. Existing in a world of opposition, Baudelaire and Duval's relationship mirrored the duality of a vampire, forever lingering
between life and death.

O23. The Effects of Transcranial Direct Current Stimulation on Conditioned Pain Modulation Response in Healthy Younger Adults

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Transcranial direct current stimulation (tDCS) is a form of non-invasive brain stimulation that can be used to modify cortical excitability. Prior research suggests that tDCS may be a viable intervention to enhance endogenous pain inhibitory capacity, a risk factor for clinical pain. The purpose of this randomized, double blind study was to determine the effects of anodal tdcs of the motor cortex and cerebellum on endogenous pain inhibitory capacity in healthy younger adults. Ten healthy adults aged 18-35 participated in three 1 to 1.5-hour sessions where pain inhibitory capacity was measured before and immediately after 15 minutes of anodal tDCS applied to either the motor cortex, cerebellum, or a sham condition. Pain inhibition was measure with a valid test called conditioned pain modulation (CPM). The repeated measures ANOVA revealed no significant changes in pain inhibition on the CPM test from pre to post any of the tDCS conditions. However, these results are preliminary as data collection is currently continuing for this study. By determining the effectiveness of using tDCS to excite the CPM response there may be uses of this technology for combatting clinical pain conditions characterized by poor pain inhibition.

Mentor: Kelly Naugle

P18. Interactions of Tryptamine with Lipid Vesicles

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In vertebrates, tryptamine, a monoamine with similar structure to serotonin, and synthesized by decarboxylation of the amino acid, tryptophan, modulates serotonin function. As with other trace amines, tryptamine's function is not well understood, but involves Trace Amine-Associated Receptor 1 (TAAR1). From previous work in our laboratory, serotonin has been shown to have greater hydrophobic interaction with dioeoyl phosphatidylserine than with dioeoyl phosphatidylcholine. The same measurement method is used here with tryptamine to measure how this

effect changes without the 5-hydroxyl group of serotonins. Nuclear magnetic resonance (NMR) was used to calibrate a hydrophobicity scale to determine chemical shift changes of tryptamine aromatic protons. Tryptamine binding was measured with the same two different phospholipids used previously to determine affinities and bound orientation. Similar to serotonin, tryptamine shows a preference for phosphatidylserine lipids over phosphatidylcholine lipids.

Mentors: Horia I. Petrache, and Bruce D. Ray

P51. Mindfulness in the Workplace

Krista Rich, Department of Psychology, IU Southeast

Mindfulness has become a hot topic in research within the past few years, and we are now focusing on how mindfulness plays into the workplace. There are prominent research and training programs being conducted that promote leadership mindfulness and its impact on leadership effectiveness, although, measures in the past look at self-rated mindfulness. This study examines the correlation between leadership mindfulness, as rated by the subordinate, and subordinate job satisfaction and intent for turnover. By having participants complete a survey, asking questions on how subordinates perceive their supervisor's mindfulness and their own levels of satisfaction and intent for turnover, we expect to find that levels of perceived mindfulness in leadership will positively correlate with levels of job satisfaction and negatively correlate with turnover intention. This study is unique in looking at the effects that leadership mindfulness has on the subordinate.

Mentors: Todd Manson, Department of Psychology, IU Southeast

O17. Walking Media Zombies: The Effects of Social Media Addiction on Sleep Quality

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This study aimed to discover the relationship between social media use at night, social media addiction, and sleep quality. College students constantly have access to social media sites through apps on their phone. Instant notifications keep them constantly replying and interacting on these sites. Sleep quality is important because it is associated with mental illness and effects the overall well-being of individuals. We expect to find that social media addiction as well as using social media at night will contribute to poor sleep quality. We expect that social media addiction will have more of an impact on sleep quality than all other factors measured. We recruited 100 participants through online surveys posted to Facebook and the Indiana University Southeast Subject Pool. All individuals were above the age of 18 and currently enrolled in college. We used the Pittsburgh Sleep Quality Index to measure overall sleep quality, the Night-time Media Usage scale to measure frequency of social media use before bed and throughout the night, and the Social Media Addiction Scale-Student Form to measure social media addiction. If our hypothesis is supported, then we will better understand the impact that social media use has on college students sleep patterns. If supported, our hypothesis will outline the importance of cutting down social media time, turning off notifications before bed, and limiting time spent on social media before going to sleep.

Mentors: 1Dr. Deborah Finkel

O13. Representations of Women, Sexuality, and Mental Illness in Literature and Feminist Theory by Women

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Women Studies, IUPUC

Women are valued for their bodies in our society, and this valuation leads to sexuality being judged, choices being taken away, and mental illness increasingly becoming part of an embodied female experience. It is important to conduct and learn from research in women's studies and literature so we can become aware and mindful of the fact that what our society and culture endorse is damaging to female bodies. This presentation will consider the idea of perfection within feminist criticism and contemporary literature, and it will examine gendered expectations women are supposed to meet. For example, with respect to Sylvia Plath, these expectations were enmeshed with facets of her identity, especially concerning the roles of wife, mother, individual, and author; she was expected to meet gendered expectations concerning these roles while also meeting feminine beauty standards and finding fulfillment in a gendered script. Authors of contemporary literature and feminist criticism treat and interrogate female embodied experience and mental illness, and this presentation will consider disordered eating in the pursuit of perfection. Seeing and valuing women for their bodies goes deeper than sexualizing them; it starts a vicious spiral of judgment and hatred, forcing women into believing that what society thinks is exactly how women should perceive themselves. As literary texts demonstrate and feminist critics argue, gendered scripts are exacting, despite the fact that gender is socially constructed. Every woman is different and unique, but women also experience many painful commonalities, which the art of our culture shows us.

Mentors: Julie Goodspeed-Chadwick

P37. The Lack of Potable Water in Africa: Damaging Society and the Economy

Courtney M. Roberts
Department of Education, IU Southeast School of Education

This study focuses on the loss of economic growth and the damaging effects unsafe water causes for the African population. This study will identify the reasons behind the lack of potable water in Africa that is causing illness and poor sanitation throughout the continent. There are nearly one billion people that do not have access to clean and safe water in Africa. The increase in poverty in Africa is also due to the scarce access to potable water that is safe for every person. From here, the data that is acquired from the economic loss and struggling society will provide concrete results that will showcase the importance of potable water in Africa, that will not only benefit the economy but will also benefit society.

Mentors: James E. Hollenbeck, IU Southeast School of Education

P35. Using a Visualized Map for Capturing the Analytical Reasoning Process of Cyber Security Analysts

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Cyber Security Operations Centers (CSOCs) have been widely built inside organizations to continuously monitor the network activity to achieve cyber situational awareness. Cyber security analysts play a critical role in CSOCs for intrusion detection and incident response. These analysts are tasked with poring over massive network monitoring data collected by various cyber defense technologies, such as Intrusion Detection System alerts and firewall logs. This data typically comes in various forms of modality. To achieve awareness of the potential attacks and to have an effective real-time response, cyber security analysts need to work in teams and must be able to quickly exchange their findings and divide tasks among each other. Currently this is done mostly manually, which is inefficient and negatively impacts response and decision-making times. To this end, we propose a hybrid, scalable, and distributed cyber-analysis collaboration support system that can capture and visualize the analytical reasoning process of analysts in real-time. The system consists of the human analysts, the Analytical Reasoning Process Capture system (ARPC), and clients working as intermediaries between cyber analysts and cloud services, capturing analysts' actions, observations, and hypotheses. The core of the system is a visualized map that facilitates analysts' communication and task division. Our current work involves adding a search feature, creating a more intuitive node labeling system, and adding colors to represent priority levels. A case study has been conducted that showed the proposed system has been effective in supporting collaboration among cyber analysts in terms of information sharing and task division.

Mentors: Chen Zhonga nd Awny Alnusair, Department of Informatics & Computer Science, IU Kokomo

P25. The Crypto Question: Are Cryptocurrencies Good Investments?

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1School of Business, Indiana University Kokomo

Cryptocurrencies are the new talking point in finance. Some people believe that cryptocurrencies are the way of the future. Nevertheless, others, such as Warren Buffet, think that they are a trend and will soon die out. This project uses various methodologies to determine if cryptocurrencies are good investments. The historical price information of10 cryptocurrencies and 5 indices is collected from Yahoo Finance. A regression analysis is performed to examine if there are any factors that affect cryptocurrency prices and returns. These methods allow us to observe various relationships between the risk of cryptocurrency investing versus the safety of index investing. Cryptocurrencies have significantly higher mean returns than the indices; meanwhile, cryptocurrencies also have drastic risk compared with the indices. The high variance indicates that investing in cryptocurrencies potentially leads to significant gains but also significant losses. Cryptocurrencies do yield an opportunity for an active investor to obtain possible gains. This information can be used to determine if an investor wants to take on the risk of cryptocurrency and realize larger gains in a shorter amount of time. All the cryptocurrencies exhibit higher average returns and volatility than the stock market indexes, which appeals to risk-taking investors. We also show that major fundamental variables are less likely to affect the returns of cryptocurrencies except for the S&P 500 index returns and the exchange rates between U.S. dollars and Euros.

Mentors: Xiaoqiong Wang, School of Business, Indiana University Kokomo, Kokomo, IN

O16. Sleep and Cognition

Katherine R. Shircliff,
Department of Psychology, Indiana University Southeast and Devan N. Case, Department of Psychology, Indiana University Southeast

The current study aims to measure the effect of sleep deprivation on change blindness. Sleep quality was measured through a Pittsburgh Sleep Quality Index (PSQI), and change blindness was measured through a Flicker Dot Probe task. In accordance with previous literature, the researchers expect sleep deprivation to have strong negative effects on change detection accuracy and latency. This research hopes to further the understanding of the role that sleep plays in cognitive functioning and provide further

examination on a topic that currently lacks research. Determining the relationship between sleep quality and cognitive functioning is crucial within the context of a restless society.

Mentors: Donna Dahlgren, Department of Psychology, Indiana University Southeast

P66. Measuring Emotional Responses to YouTube Videos

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1Department of Psychology, School of Social Sciences, Indiana University Southeast

Prior research has shown that interactions with nature and animals can have a positive effect on human emotions. Daily life is often stressful and can have a negative impact upon one's emotions, however due to busy schedules, one does not always have the ability to go outside or interact with an animal. In this study, we examine the effect that videos can have upon emotional states in students and Facebook users. Using YouTube videos and a survey that included adjectives describing emotional states, we are able to analyze how particular types of videos effected the emotional states of our participants. It is expected that we will find that videos containing natural scenes and animals will have a positive effect, while a countdown will have a neutral or negative effect upon a participant's emotions. The implications of these results could assist in the determination of different methods of stress reduction through the use of technology and videos.

Mentors: Donna Dahlgren, Department of Psychology, School of Social Sciences, Indiana University Southeast

P46. Gender differences in sexual attitudes

Jacob Smith, Savannah Horn
Psychology Indiana University Southeast

The purpose of our study is to analyze the non-binary gender differences in sexual attitudes among young adults. The study compares sexual attitudes of individuals varying in sexual orientation, gender identity and biological sex. To assess the differences, we used an online survey that asked 25 questions pertaining to sexuality. We hypothesize that there will be gender differences in sexual attitudes across the gender spectrum. This study provides a unique view into the norms and attitudes of varying genders as society's acceptance of non-binary genders increases.

Mentors: Donna Dahlgren, Department of Psychology, Indiana University Southeast

O38. Identifying GC rich and GC poor regions in understanding the organization of Alu-elements in the genome.

Mr. Tony Smith

By physical constraints on the base composition of the DNA, the sum of the G/C content and A/T content adds up to be 100 percent of the genome. The abundance of G and C nucleotides in the genome relative to the A and T nucleotides has long been observed and recognized even in the pre-human genome era. Ideally, regions in the genome that contain more of G/C as opposed to A/T are referred to as GC rich regions. Regions in the genome that contain more of A/T nucleotides as opposed to G/C nucleotides are referred to as GC poor regions. Ideally, GC poor regions are the AT rich regions of the genome. However, measuring the base composition percent of regions in the genome is mostly dependent on the sliding window size. Identifying GC rich and GC poor regions help in understanding the organization of the genome and so in this research project we have used data on GC rich retro transposons (Alus) as our sliding window to then help characterize the chromosomes to get a better understanding of GC rich (islands) within each human chromosome.

Mentor: Dr. Sridhar Ramachandran

O9. Studying the Genes that Affect Me31B's Expression in Drosophila Germ Cells

Dhruv Solanki1, Neal Govani1, and Ming Gao
1Biology Department, Indiana University Northwest

Me31B is an essential protein for germ cell development in Drosophila melanogaster (fruit fly). Me31B proteins function at particular locations in the germline cells like the perinuclear region of nurse cells and the posterior end of oocytes. Our previous proteomics studies show that Me31B interacts with two germline proteins, Cup and Tral, so we hypothesize that Me31B protein's localization to its proper subcellular location depends on Cup or Tral. To test this, we used gene mutation, or RNAi, to generate cup and tral mutant fly ovaries. The ovaries were immunostained with anti-Me31B antibody to visualize the expression and localization of Me31B. The results showed likely defective Me31B localization in cup and tral mutant ovaries when compared to the wild-type. Western blots were conducted with the cup and tral mutant ovaries to quantify Me31B and Tral protein levels. We observed lower amounts of Me31B and Tral proteins in both cup and tremulants. These results indicate that Cup and Tral have an effect on the expression and likely the localization of Me31B. In future experiments, we plan on studying the mechanisms of how these proteins affect Me31B expression. These experiments will shed light on how Me31B is regulated by these proteins and the importance of this regulation in germ cell development.

Mentor: Ming Gao, Biology Department, Indiana University Northwest

P36. Agriculture improvements
Demetrius Stanton

The plow is the reason why settlement of the American-Canadian prairies where settled. I will trace the advancement of civilization by the type of plow that they utilized. Covering the advancements, the plow made possible and other areas it increased the growth and forward progress of America, especially in those times.

O27. Eisenhower's Best Mistake: Earl Warren and the Civil Rights Activism of the Warren Court
Alexandra N. Stepp
Department of History, IU Southeast School of Social Sciences

This paper explores how Chief Justice of the Supreme Court Earl Warren's early exposure to poverty, political efficacy, and the plight of minorities not only caused him to give liberal support to the cases of the Civil Rights Movement but also the leadership skills he gained through political office helped him to persuade his fellow justices to do the same, effectively making the Warren Court the largest source of governmental aid to the movement. While most historiography focuses on the impact of Congress on the Civil Rights Movement, an examination of the existing scholarly works on the Civil Rights Movement and the Warren Court, the case rulings of the Warren Court in relation to the movement, and the writings of Earl Warren demonstrate how the Supreme Court had a more consistent and apparent positive impact on aiding the goals of the movement, at least partly due to Warren's influence. Such findings not only demonstrate the underemphasized importance of the Supreme Court on the movement, but they also reveal how the Supreme Court can be shaped by a single individual and how the Supreme Court can be utilized to further democratic principles.

Mentor: Elizabeth Gritter, Department of History, IU Southeast School of Social Sciences

P67. Collegiate Athlete Survey
Annie M. Thomas, Glenn A. Giles
Indiana Southeast Department of Psychology

This study focuses on academic success, stress levels, and social support in current and former collegiate athletes. The objective of the study is to examine differences between male and female collegiate athletes. Indiana University Southeast athletes were surveyed via Facebook and through the assistant athletic director. Both former and current athletes participated. Participants completed the perceived stress scale, a social support questionnaire, and questions about their academic success. Three separate hypotheses tested were: H1: Female collegiate athletes will have higher academic success. H2: Females will have higher stress levels than males. H3Male athletes will have a higher social support. Implications of these data for college will be discussed.

Mentor: Dr. Donna Dahlgren, Indiana Southeast University Department of Psychology

P29. Renewable Energy's Present and Future Outlook
Elysa Thompson1
1Department of Mechanical and Energy Engineering

Today's technology is continually adapting and overcoming its previous limitations –including renewable technology. The author has built an understanding of today's renewable technology to build and construct a forecast of the role that renewables will play in tomorrow's society. An understanding is being developed by the author of the current green technologies with the purpose to then informthe audience of where America stands in the global perspective of renewable technology. Also, inform of the different kinds of technologies and the perspective developments and integration of these technologies throughout the world are addressed. A discussion of how to better integrate energy efficiency using renewable technology coupled with other methods such as auditing of one's energy usage are too addressed. The author strives to present the history, growth, and outlook of energy not only in America but globally to further break down the trends and future renewable technology.

Mentors: Ali Razban, Department of Mechanical and Energy Engineering

P65. Reactions to Being Confronted About Prejudice
Karen Torres, Kathryn M. Kroeper,
Department of Psychology, Indiana University-Bloomington, IU School of Arts and Sciences

Studies done by researchers in the past suggest that people who are confronted about their prejudicial actions are less likely to stereotype in the future. Scholars know little about people's reactions to being confronted and because this has only been shown in a few studies, more evidence is needed before confrontation can be recommended as a prejudice reduction strategy. Many studies have also indicated that many "would-be" confronters who witness prejudice are reluctant to confront perpetrators for fear of the possible negative social costs. People fear how perpetrators will react: what will the perpetrator say? What will they think of the confronter? The present study was designed to investigate how people react when they are confronted about their prejudicial actions. Students from a Midwestern university were invited to the lab ostensibly to interact with a partner on a decision-making task. In reality they worked alongside a computer which later confronted them about their prejudicial answers. Once the task was completed the participants were given the option of leaving a written

response for their "partner". After coding the written responses for different types of reactions, we concluded that only a small fraction of respondents showed emotion, such as guilt in their responses. Therefore, more evidence is still needed in order to recommend confrontation as a prejudice reduction strategy.

Mentors: Kathryn M. Kroeper, Elinam Ladzekpo, Mary Murphy, Department of Psychology, Indiana University-Bloomington, IU School of Arts and Sciences

P3. Effect of Garlic Mustard (an Invasive Plant) on Survival and Mycorrhizal Fungal Abundance in Hydrophyllum appendiculatum (a Native Understory Plant)

Heidi Porod1, **Catherine Vaerewyck1**, Deborah Marr1
1Department of Biological Sciences, Indiana University South Bend

Hydrophyllum appendiculatum, a native understory plant, has declined from 13.9 ± 12.2 plants (mean ± stdev) per 10 m transect in 2003 to 3.7 ± 5.7 plants in 2018 in St. Patrick's County Park, St. Joseph County, Indiana. Alliaria petiolata (garlic mustard) is a common invasive plantin Northern Indiana. We tested two hypotheses regarding whether garlic mustard is contributing to the decline of H. appendiculatum (HA). First, we tested whether presence of garlic mustard affects HA survival. First-year HA were grown in the greenhouse under one of three treatments: garlic mustard in pot with HA, 0.001 mM of allyl isothiocyanate (secondary compound from GM) added once per week to pot, or no GM exposure. HA survival was significantly lower with GM present (mean 44%), but there was no difference in survival between allyl isothiocyanate and control treatments (means 68% and 73% respectively; $F_{2,42}= 5.3$, $P = 0.008$). Previous studies have shown that GM can reduce mycorrhizal spore abundance. We compared mycorrhizal abundance in HA roots collected from forests with and without GM. There was no difference in mycorrhizal abundance in HA roots (forest with GM 24.1% ± 19.2% and forest without GM 22.0% ± 25.7% of roots with mycorrhizal hyphae; $T = 0.37$, $df = 60$, $P = 0.71$). These results did not support our predictions, as we expected to see more mycorrhizae in areas without garlic mustard. However, the greenhouse experiment suggests that the presence of garlic mustard could be reducing survival of first-year H. appendiculatum.

Mentors: Deborah Marr, Department of Biological Sciences, Indiana University South Bend

O22. Short-term pharmacologic inhibition of RAGE suppresses bone turnover and muscle atrophy in aging

Sinai Valdez1, Hannah M. Davis1, Lilian I. Plotkin1
1Department of Anatomy & Cell Biology, Indiana University School of Science

Osteocytes, cells embedded in the bone matrix, are key in regulating bone turnover by controlling the function of bone-forming (osteoblast) and resorbing (osteoclast) cells (Burr & Allen Basic Bone Biology, 2014). Research from previous work indicates a specific gap junction protein called connexin43 was observed to be an important component of the signaling pathway controlling osteocyte survival (Bivi et al, JBMR 2012). Further, aging decreases connexin43 and deletion of this protein was found to mimic the skeletal phenotype of old mice (Davis et al Aging Cells, 2017). Based on these findings we sought to further examine link between osteocyte apoptosis and osteoclast differentiation. Previous studies have shown that high mobility group box 1 protein (HMGB1), a pro-inflammatory cytokine that activates the receptor for advanced glycation end products (RAGE), is released by dying osteocytes and mediates osteoclast recruitment/differentiation (Plotkin Nat. Rev. Endocrinol, 2016). In order to address the role of these molecules in the skeleton, we injected mice with a small molecule RAGE inhibitor in order to prevent HMGB1-RAGE activation. The data collected so far further confirms the role of RAGE signaling in osteoclast differentiation as evidenced by the decreases in osteoclast number/ bone surface in animals treated with the RAGE inhibitor. Based on preliminary data suggesting that the RAGE inhibitor may also be affecting skeletal muscle in aging. I will be looking at muscle histology and measuring the cross-sectional area (CSA) of the muscle fibers and the CSA of specific muscle fiber-types. These measurements will allow us to examine whether aging and/or treatment with the RAGE inhibitor changes the size or distribution of muscle fiber-types. Allowing us to better understand if the RAGE inhibitor is in fact affecting muscle atrophy in aging in addition to the effects that it had on bone (osteoclast number). Through these studies we hope to further understand the molecular signals that link osteocyte apoptosis and osteoclasts recruitment/ differentiation in aging.

Mentors: Lilian I. Plotkin Department of Anatomy & Cell Biology, IU School of Medicine, IUPUI

P22. The Textile Industry and Its Impact on the Second Industrial Revolution

Julia Verdouw
IUS School of Education

The textile industry developed quickly in America and had great benefits and effects on the country, especially during the second industrial revolution. The second industrial revolution occurred from 1870 through 1914. The production and technological advancements at this time happened at a rapid speed, and this is evident in the textile industry. Although the textile industry did not move as quickly as other industries such as the ones for coal and iron, it did make great advancements and became more efficient.

Mentors: IUS, School of Education

O33. Victims or Perpetrators: How Former Hitler Youths Work Through Their Childhoods under Nazi Rule

Emily Vetne1
1Department of History, Indiana University Bloomington

This project focuses on Hitler Youth and Bund Deutscher Mädel members as adults in a post-Nazi world: how they've internalized their state-prescribed childhoods, whether their Vaterland-centric actions still affect them, and ultimately, whether they believe themselves to have been complicit, or innocent. I am particularly interested in both diaries and memoirs, because of the former's immediacy and the latter's perceptive. For this project I analyzed multiple different memoirs, one by a Hitler Youth member and others by Bund Deutscher Mädel. I argue that these adults are split on the issue of guilt: some view themselves to be Hitler's victims (albeit victims of stolen childhoods, not life) and some view themselves as complicit in war crimes. Many factors, including emigration from Germany, level of education, therapy, and possibly gender play into the self-perception of guilt. This research highlights the lingering effects of Nazi Germany on unconventional actors: those in the grey areas between perpetration and victimhood.

Mentor: Mark Roseman, Department of History, Indiana University Bloomington

P73. Childhood Abuse and Behaviors in Adulthood

Jasmine M. Vonderheide1 and Kelsey M. Fortner1
1Department of Psychology, School of Social Sciences, IU Southeast

Dope, coke, crank, drank, whatever one might call it, the abuse of drugs and alcohol in America increases at rapid rates every year. While drug and alcohol abuse rates are increasing, so are childhood abuse rates. An estimated 22 million Americans abuse substances yearly and an estimated 3.2 million children are investigated in child protection agencies. Research on childhood abuse and substance abuse is large, but research on the two in correlation are not as closely studied. Research shows that women are more likely to report childhood abuse, but research does not show whether men or women are more likely to report substance use in adulthood. Our study will look at childhood abuse as a risk factor for future substance abuse as well as gender differences in substance abuse. Distribution of a survey will allow for data collection on childhood abuse and substance abuse. For the study, we hypothesized that there will be a positive correlation between childhood abuse and substance abuse. We also hypothesized that women who have been abused as children will be more likely to abuse substances in adulthood. In conclusion, with the results we plan to bring to light the issue of both childhood abuse and substance use, and express early intervention strategies for those in child protective services to lower the rates of childhood abuse, therefore lowering rates of substance abuse.

Mentor: Todd Manson, Department of Psychology, School of Social Science, IU Southeast

P14. Photoelectrochemical and Optical Studies on Photoactive Interface of SnS2, SnS Occluded in Poly 2,2 Bithiophene (PBTh)

Jordan Wenger1, Kasem K. Kasem1
1Indiana University-Kokomo, School of Sciences

Inorganic/Organic Interface (IOI) assemblies Of SnS2/PBTh, and SnS/ PBTh were created using occlusion electrodeposition method on an FTO glass electrode. TheI/O/I assemblies were subjected to photoelectrochemical investigation in aqueous acetate electrolytes. We studied the changes in the photocurrent generation as an indicator for this assembly's ability to cause the photoinduced charge separation. Further electrochemical impedance spectroscopy (EIS) studies were used to investigate changes in electrical properties, such as dielectric constants and electrical conductivity. The optical parameters such as the optical conductivity (σ opt.), optical absorption coefficient (α), refractive index (n), real dielectric constants (εr), and imaginary dielectric constants (εi) were also investigated. Results show that SnS is much less photoactive than SnS2. Guided by the properties of PBTh, some changes in the energy band structure occurred due to occlusion of SnS2and SnS in PBTh films.

Mentors: Kasem K. Kasem, Department of Chemistry, Indiana University-Kokomo

026. Methods of Communication in the United States and its Impact from 1800 to Present

Taylor Renee Whitehead
Indiana University Southeast

The purpose of this research is to look at the ways that people in America have communicated with each other, by focusing on the impact that the technology has created. The impact of this technology has given us more ways to communicate, with more people, and has impacted the way society works. Starting with1800 and continuing through the current years, I will present to readers in order to show how the technology improved over time in order to aid communication in America. This research is important because knowing how communication has evolved makes us more appreciative of how far America has come in such advancements.

Mentors: James E. Hollenbeck, IUS School of Education

015. Development of the Railroad System and the Effects on the Social and Economic Structure of the United States

Laura A. Zoeller
Indiana University Southeast, School of Education

The purpose of this research is to examine the positive social and economic effects the railroad system had on the United States. My research will draw from primary sources including books and journal articles. The research will show that the technologicaladvancement and expansion of the railroad system in the United Statesled to the development of cities and advancements in trade which strengthenedthe country both economically and socially.

Mentor: Doctor James Hollenbeck, Indiana School of Education