

ORAL PRESENTATIONS

Oral Session A

O1. Investigation of the Cold-Regulated Promoter *RD29A* in *Arabidopsis thaliana* and *Glycine max*

Adib Behrouzi, Jennifer Robison, Stephen Randall (IUPUI)

The inability of certain agriculturally important plants to tolerate extreme environmental conditions is a concern for the maintenance and improvement of food production. Previous work shows that the *Arabidopsis thaliana* promoter RD29A is responsive to a variety of abiotic stresses, and the RD29A gene is involved in cold-stress adaptation. An RD29A reporter construct (AtRD29A::GUS/GFP) was constructed and transgenically introduced into *Arabidopsis thaliana*(At) and- *Glycine max* (Gm). Homozygous AtRD29A::GUS/GFP transgenic lines (four At and three Gm) have been identified. Examination of *Arabidopsis* seedlings showed GUS activity in trichomes, roots, and leaf tips. Tissue and organ expression during cold treatment of RD29A::GUS/GFP in a cold-tolerant plant (At) was compared to the cold-intolerant soybean plant (Gm). Lines of At and Gm were examined quantitatively in an assay using the substrate 4-methyl-umbelliferyl- β -D-glucuronide (MUG) with extracts of control (22°C) plants or plants treated for 2 days in the cold (4°C). The GUS assay showed a strong increase in cold-driven RD29A expression of GUS activity in both At and Gm. These data support the hypothesis that RD29A is cold-regulated in both *Arabidopsis* and soybean. This promoter will be a useful tool to help understand how cold tolerance occurs in cold-tolerant plants and may help determine why soybean is not cold tolerant.

Mentor: Stephen Randall, Department of Biology, School of Science, Indiana University-Purdue

O2. Effects of smoke alarm loss in nociceptive neurons of *Drosophila*

Katherine H. Fisher, Stephanie E. Mauthner, W. Daniel Tracey (IU Bloomington)

Drosophila area robust system for studying nociception, defined as the act of sensing and processing painful, noxious stimuli. Larvae exhibit a highly stereotyped behavioral response, resulting in a corkscrew-like rolling behavior, when presented with a noxious stimulus. Our lab is interested in using this behavioral paradigm to identify neural circuits and genes involved in nociception. In a genetic screen, our lab recently identified genes that are enriched in pain sensing neurons, or nociceptors, and that are functionally important for thermal nociception. We identified a previously uncharacterized gene, which we named smoke alarm due to a hypersensitive behavioral response to noxious thermal stimuli upon RNAi knockdown. Analysis of nociceptor morphology revealed hyperbranched dendrites. We hypothesize that a hypersensitive response to painful stimuli is due to the hyperbranched dendrites of the nociceptors. To further characterize smoke alarm, we created a new allele that drives the expression of GFP in cells where smoke alarm is expressed. We detected robust expression in pain sensing neurons, as well as in gentle touch detecting neurons, chordotonal organs, and proprioceptive neurons. We hypothesize that smoke alarm acts to regulate dendrite morphogenesis in pain sensing and other sensory neurons.

Mentor: Stephanie E. Mauthner, W. Daniel Tracey

O3. Developmental and Sex-Specific Differences in Trisomic Dyrk1a Expression in Brain Regions of Ts65Dn Down Syndrome Mice

Abigail J Parker, Megan Stringer, Randall J. Roper, Charles R. Goodlett (IUPUI)

Down syndrome (DS) is caused by the triplication of chromosome 21 (Hsa21) in humans and is the leading genetic cause of intellectual disability. Ts65Dn mice are used as a model of DS and are trisomic for ~50% of homologous genes on Hsa21. Individuals with DS show sex-specific differences in life expectancy, developmental age, and cognitive ability. Mouse models of DS show sex-specific differences in anxiety and composition of some brain structures. Despite observed differences between sexes in both humans with DS and DS mouse models, limited research has been done to determine if differences in protein expression of trisomic genes exists, and none has examined whether trisomic protein expression varies by sex over development. Overexpression of Dyrk1a, a gene triplicated in both individuals with DS and Ts65Dn mice, has been linked to DS cognitive phenotypes, whereas underexpression of Dyrk1a has been linked to other neurological abnormalities. Dyrk1a is associated with DS phenotypes, and has been touted as a target for drug development. We hypothesize that trisomic males and females differentially express Dyrk1a protein during critical periods of neurological development. This study will quantify Dyrk1a protein in the hippocampus, cerebellum and cerebral cortex at postnatal days 6, 12, 15, and 18 in male and female Ts65Dn mice to determine whether Dyrk1a exhibits differential expression between sexes. The results from this study will provide crucial information as to whether there may be important differences between males and females that need to be considered in devising therapies targeting DYRK1A for individuals with DS.

Mentors: Randall J. Roper, Department of Biology, IUPUI; Charles R. Goodlett, Department of Psychology, IUPUI

O4. Reducing sedentary time in Fibromyalgia patients: Study design and protocol

Dania Aqeel, NiCole Keith, Anthony Kaleth, Stephen Fallowfield, Keith Naugle, Matthew Bair, Kelly Naugle (IUPUI)

Fibromyalgia is characterized by widespread musculoskeletal pain and symptoms that include fatigue, sleep, and exacerbation of symptoms with physical exertion. People who have fibromyalgia tend to be sedentary and spend less time in physical activity within all intensities. Prior research supports the ability of exercise to reduce pain, however symptoms of fibromyalgia create obstacles to exercise. A recent study discovered that low levels of sedentary time and high levels of light physical activity were associated with less pain and better physical function in fibromyalgia patients. However, the impact of reducing sedentary behaviors in fibromyalgia patients has yet to be discovered. The purpose of this feasibility study is to design and evaluate a behavioral intervention designed to replace sedentary behavior with light physical activity in veterans with fibromyalgia. Twenty-four veterans with fibromyalgia will be enrolled and will participate in an 8-week intervention designed to reduce sedentary time. Intervention components include education, wearing an activity tracker that synchronizes with a phone app to self-monitor activity, steps, and stationary time, and weekly 30-minute phone meetings with a study coach to set and discuss activity goals. Outcome measures include: 1) accelerometry to objectively measure physical activity, 2) validated questionnaires to measure clinical pain and function, and 3) the 6-minute Walk Test and 30-s Chair Stand Test to measure physical function. This study will be the first step in our long-term goal of determining whether increasing light physical activity and decreasing sedentary activities help decrease symptoms in fibromyalgia patients.

Mentors: Kelly Naugle, Department of Kinesiology, IUPUI School of Physical Education Tourism Management

Oral Session B

O5. Synthesis and Characterization of Nano Sensing Devices

Ibrahim Momoh, Ali Daneshkhah, Agarwal Mangilal (IUPUI)

The concentration of acetone and ethanol in human breath is known to have a correlation with blood glucose levels. In this research program fabrication and experimental procedures for development of nanomaterial-based highly sensitive acetone sensor is investigated. This includes (1) fabrication and development of interdigitated electrodes via lithography process, (2) casting of nanomaterial on the interdigitated electrodes, and (3) testing of the sensor. It is important that the nanomaterial shows alike characteristic over time. The degradation study on a set of already developed sensors will be conducted during the research program. Material sensitivity to acetone will be tested by alternately exposing the material to target vapor and humidified air in a test chamber, and measuring absorption and electrical properties. After all these are done, a hand held device will be created with the sensor, which can be used to collect sensor data via Bluetooth from the sensor. The poster will present the details of fabrication and practical results of the nanocomposite materials, device circuit and sensors.

Mentor: Mangilal Agarwal, School of Engineering and Technology, IUPUI

O6. Identifying Key User Requirements for Campus Food Insecurity Through Participatory Design Workshops

Jiva Capulong (IUPUI)

Food insecurity, the struggle to regularly obtain healthy and affordable food, is an issue that affects a seventh of the US population, including college students. Prior research has shown that food insecurity can persist throughout one's life, including the vulnerable transition from high school to college. In this study, we focus on how technology may help college students with food challenges. We aim to identify key user requirements that would inform future design work in this space. We will conduct participatory design (PD) workshops because they are an effective approach towards identifying potential opportunities for food support technologies for marginalized and vulnerable populations, like food insecure people. In PD, project stakeholders take an active role in the design process. Having their input ensures the end result successfully addresses their needs. In our study, we will recruit self-identified food insecure individuals and those who are interested in food insecurity to be our participants, where they will identify food challenges and create low-fidelity prototype designs that would help address them. We expect that the resulting designs will reveal key user requirements for designing for campus food insecurity. To date, we have conducted two pilot workshops. Next, we will conduct five workshops with four to five participants each over the fall semester. Through this study, we highlight the importance of user input in participatory design to address needs that might have otherwise been overlooked, and what kinds of technological opportunities and areas of intervention may be found when applied to food insecurity research.

Mentor: Lynn Susan Dombrowski, Human-Centered Computing Department, IUPUI

O7. Bridging The Gap: Natural Computation of Neural Systems

Keiland W. Cooper (IU Bloomington)

The brain has been equated to a computer since the first hints of a computing machine arose, yet the debate of the metaphors accuracy remains alive. However, this debate may miss its mark in considering the impact its conclusions could provide to both fields if the premise is held true. Using notions from the study of natural computation subsumed under physics, such as computational resources or complexity theory, and then applying these to neuroscience and cognitive psychology offers novel insights to the complex structure, which can be explored using motifs from empirical experimental results. Bridging the gap between the two fields will open the study of the brain to the rich tools which computer science and complexity theory have provided, and promises to offer novel insights to benefit both fields.

Mentors: Amit Hagar, History and Philosophy of Science, Indiana University Bloomington

O8. Noise-Induced Stabilization of Perturbed Hamiltonian Systems

Anthony Coniglio, Tiffany Kolba, Sarah Sparks, and Daniel Weithers (IU Bloomington)

Noise-induced stabilization is the phenomenon in which the addition of randomness to an unstable deterministic system of ordinary differential equations (ODEs) results in a stable system of stochastic differential equations (SDEs). A Hamiltonian system is a two-dimensional system of ODEs defined by a Hamiltonian function, which is constant along each solution curve. With stability defined as global stochastic boundedness, Hamiltonian systems cannot be stabilized by the addition of noise that is constant in space. Therefore we studied ways to deterministically perturb different Hamiltonian systems in such a way so that the qualitative behavior of solutions is preserved but noise-induced stabilization becomes possible. We provide a systematic framework for methods of perturbing these systems and proving noise-induced stabilization.

Mentor: Tiffany Kolba, Department of Mathematics & Statistics, Valparaiso University

Oral Session C

O9. Lihawu Male Mentoring Camp: Understanding the Long Term Impacts on Attitudes and Perceptions Relating to Male Circumcision, HIV/STI Knowledge, Gender Inequalities and Masculinities in Swaziland

Michelle Ramirez, Sihle Makhanya, Alfred K. Adams, Dennis P. Watson, Vusi Maziya (IUPUI)

With approximately 31% of the adult population (18-49) living with HIV, Swaziland has implemented various strategies to reduce the rapid spread of HIV such as voluntary medical male circumcision (VMMC). Some studies show that Swaziland's patriarchal society perpetuates gender inequalities and toxic masculinities embedded in the cultural, social, political, and economic environments which affect the disparate transmission of HIV in the country. As a way of mitigating these gender inequalities, most programs have focused on women's empowerment consequently leaving men behind. We argue that involving men in HIV prevention interventions will complement programs focusing on women. One such program is the 3-day Lihawu Male Mentoring Camp (LMMC) for young men ages 15-29 that offers a package of biomedical male health services including HIV testing services and VMMC as a primary aim. The second objective of the camp engages participants in goal setting, self-awareness training, cultural observances, gender equality and toxic masculinity conversations, healthy relationships, condom use, and HIV/STI knowledge. Eleven focus groups and four in-depth interviews with 43 participants were conducted to understand the long-term impacts of the LMMC on attendees' attitudes and perceptions towards the camp objectives. A purposeful and convenient sampling of LMMC attendees that opted for circumcision was compared to the control group of routinely circumcised individuals who did not attend camp. The thematic analysis of the data revealed that the camp attendees were more informed and receptive towards themes relating to gender equality, positive masculinities, sexual consent, condom usage, STIs, HIV/AIDS, male circumcision and goal setting unlike the routinely circumcised young men who were more resistant and less knowledgeable about these topics. These findings will inform the LMMC to better meet the needs of its target audience as well as enlighten the design of future research studies, interventions and policies relating to similar topics.

O10. Implications of Expectation Formation in Monetary-Fiscal Policy Interactions

Chase R. Abram (IU Bloomington)

The aim of this paper is to shine light on some of the questions surrounding the role of expectations in monetary-fiscal policy interactions. In macroeconomic price theory, there is an emphasis on the idea that price-level determination is a forward-looking process, and therefore relies upon information regarding future fiscal and monetary variables, which are not determined at the time the price level is determined. The objective at hand is to scrutinize the methods by which these expectations are often assumed to form. Both a discrete and a continuous infinite-horizon representative agent model are presented to allow analysis of some of the typical assumptions made in the monetary-fiscal literature, and what satisfaction or violation of these propositions implies- for price-level determination and policy choice. These models suggest methods, both theoretic and econometric, for evaluating the efficacy of historical policies, and suggest considerations for construction of future policies. These results are of interest to parties involved in policymaking, and thus might be illuminating to central banks or even national governments.

Mentor: Eric Leeper, Department of Economics, Indiana University – Bloomington

O11. Defining Shared Decision-Making in Lung Cancer Screening: A Concept Analysis

Alexxis Randle, Lisa Carter-Harris (IUPUI)

Lung cancer screening is a recent U.S. Preventive Services Task Force recommendation for long-term smokers. In 2015, the Centers for Medicare and Medicaid Services approved coverage for lung cancer screening, but mandated documentation of shared-decision making in order for the service to be reimbursed. Shared decision-making is elusive in practice, and the active ingredients are not fully understood in relation to decision outcomes in a cancer screening decision. Although Medicare has defined the basic components for documentation purposes, understanding the concept of shared-decision making more thoroughly is a current scientific need in order to support patient-provider discussions about lung cancer screening. Therefore, a concept analysis was completed using Rodgers's evolutionary method exploring shared decision-making in lung cancer screening. 1,209 articles were retrieved during the initial search of the literature, and 20 total articles met inclusion criteria and were reviewed. The main attributes identified include: 1) understanding of the disease process and its accompanying risks; 2) weighing risks and benefits associated with screening; 3) collaborative decision process between patient and provider; and 4) incorporating patient values. Patient-provider discussions are increasingly moving toward a shared-decision making model in efforts to increase patient-centered care, and clearly defining the concept of shared decision-making is essential for the state of the science.

Mentor: Lisa Carter-Harris, Indiana University School of Nursing

O12. Persona Theory: Understanding Masculinity Through Old Spice Commercials

Andrew Fields (IU Kokomo)

This presentation will be using theories in communication to analyze Old Spice commercials that featuring Terry Crews and Isaiah Mustafa. Commercials featuring these two actors are known as humorous and creative; Crews is shown as a power-obsessed man, while Mustafa is a sweet-talking man who talks directly to women in his commercials. This presentation seeks to expand on existing literature to analyze how these commercials have been used to promote sales of Old Spice products. To do this, I utilize theories regarding persona. The first and second persona, which analyze the way the presenter of the message intends the audience to perceive the message giver (the first persona) and the way the presenter intends the audience to perceive themselves (the second persona). This is supplemented with concepts in advertising persona, verisimilitude and omniscience. The former allows the commercial to be accepted as lifelike and real, and the latter is the idea that the commercial has all information needed to sell product to the target audience. With these theories, I discover that while these two actors are used to appeal to social concepts of masculinity, they appeal to different types of masculinity; one designed to appeal to the masculine idea of men being powerful, and the other which is designed to appeal to the masculine idea of men being desirable by women. This presentation applies concepts in persona theory, illustrating how the constructed perception of a company in messages can be used, and changed between messages, to sell their product.

Mentors: Christopher Darr, Department of Communication and Performing Arts, Indiana University of Kokomo; Erin F. Doss, Department of Communication and Performing Arts, Indiana University of Kokomo

Oral Session D

O13. Cracking the Social Media and Depression Code

Chalee Lightsy, John'Nesha Graves (IU Southeast)

The purpose of this study is to assess the relationship between social media use and depression among young and emerging adults. Over the years the number of individuals using social media has increased, in turn the number of individuals experiencing depression has increased also. Concerns have arisen about whether social media has caused depression, or whether depressed individuals tend to use social media more often. In this regard we hypothesized young adults who were more active on social media would experience greater incidences of depressive symptoms when compared to less active peers. About 100 participants were gathered online through the Indiana University Southeast subject pool. They were asked to provide demographic information and complete two surveys via Qualtrics. They were given the Beck Depression Inventory to assess their level of depression, as well as a social media inventory to assess level of social media use. We created this inventory with questions such as 'On average, how much time do you spend on social media daily?'. They were able to choose from four different responses like: 0-30 mins, 31-59 mins, 1-3 hrs, or over 3 hours'. We expect to find a correlation between social media use and depression such that as social media use increases so too will depressive symptoms.

Mentor: Deborah Finkel, Department of Psychology, Indiana University Southeast

O14. A test of the reward-contrast hypothesis

Stefan J. Dalecki, Panoz-Brown, D.E., and Crystal, J.D. (IU Bloomington)

Source memory, a facet of episodic memory, is the memory of the origin of information. Whereas source memory in rats is sustained for at least a week, spatial memory degraded after approximately a day. Different forgetting functions may suggest that two memory systems (source memory and spatial memory) are dissociated. However, in previous work, the two tasks used baiting conditions consisting of chocolate and chow flavors; notably, the source memory task used the relatively better flavor. Thus, according to the reward-contrast hypothesis, when chocolate and chow were presented within the same context (i.e., within a single radial maze trial), the chocolate location was more memorable than the chow location because of contrast. We tested the reward-contrast hypothesis using baiting configurations designed to produce reward-contrast. The reward-contrast hypothesis predicts that under these conditions, spatial memory will survive a 24-h retention interval. We documented elimination of spatial memory performance after a 24-h retention interval using a reward-contrast baiting pattern. These data suggest that reward contrast does not explain our earlier findings that source memory survives unusually long retention intervals.

Mentor: Jonathon Crystal, Department of Psychological and Brain Sciences, IU College of Arts and Sciences; IU Bloomington

O15. Fracking in the United States

Genesis R. Blair (IU Southeast)

Hydraulic fracturing, also known as fracking, is a type of oil and natural gas extraction. Fracking involves the injection of liquid at high pressures into rocks that contain oil and natural gas to force open fissures in the rocks to release the oil and natural gas for extraction. What is the known and hypothetical costs of fracking in the United States in the quest towards energy independence?

Mentor: James Hollenbeck, Department of Education, IUS School of Education

O16. Association between the Big Five Personality Traits and Facebook Usage

Courtney Morgan, Taylor Fedders, Tatum Tedtman (IU Southeast)

In this study, we explored the impact of the Big Five personality traits on Facebook usage. The Big- Five personality traits include openness, extroversion, agreeableness, conscientiousness, and neuroticism. We will be examining the aspects of Facebook usage including the frequency of posting, time spent on Facebook, impulsiveness of posts, user's main purpose for using Facebook, and security concerns. We collected data from psychology students at Indiana University southeast (IUS), and from Facebook users. We presented the participants with the Big Five Inventory (BFI) survey, and an original social media survey created by the researchers. Using the Big Five Inventory (BFI) survey, and an original social media survey, created by the researchers. We suspect the content of what college students post on Facebook depends more on their scores for agreeable- ness, neuroticism, and extroversion; than on their scores on openness and conscientiousness.

Mentor: Dr. Deborah Finkel

O17. The Substance of Personality: Alcohol and Marijuana as Possible Predictors of Personality

Jonathan Sturgill and Brandi Kaelin (IU Southeast)

This study will show if there is any connection between marijuana or alcohol use and personality, specifically sensation seeking behaviors. We would like to see if sensation-seeking behaviors could be a predictor to whether or not a person is at risk for heavier usage of either alcohol or marijuana. To do this, data was collected from students in introductory psychology classes and graduate students from Indiana University Southeast. The participants were given a brief demographic section, the Sensation Seeking Scale, and then either the Alcohol Expectancy Questionnaire or the Marijuana Expectancy Questionnaire. What we expect to find is that higher sensation seeking will predict higher alcohol expectancy as well as lower sensation seeking will predict higher marijuana expectancy. It is the authors' hope that this study will contribute to the field by showing how alcohol and marijuana use can predict personality and substance use in college students.

Mentor: Deborah Finkel, Department of Psychology, IU Southeast

Oral Session E

O18. Decolonizing Methodologies and Allyship: Language, Power, Identity

Varshini Balaji (IUPUI)

This study explores the relationship between power, identity, and Discourse with a focus on how colonization and imperialism has established a dominant discourse of the “East” that harbors and continues to perpetuate deep-rooted prejudice and stereotypes. This study also attempts to recognize the impact of the dominance and prevalence of the English language on policy making, politics, and education systems in India. Much of the data in this study was gathered in the form of an anonymous survey sent to Indian American students, Indian international students, and Indian students with international exposure in universities around the world. By studying secondary research in tandem with primary data, this study proves to be consistent with existing research about language and power in identifying that the English language is an important predictor of financial access and success in the Indian society. This study shows how colonization continues to manifest in different forms and aims to contribute to decolonial work. It contributes to the creation of alternative discourses that unpack issues of power, oppression, and Allyship in a decolonial lens.

Mentor: Dr. Marilee Brooks-Gillies, Department of English, Indiana University School of Liberal Arts at IUPUI

O19. Unrecognized Violence: Ideations of Physical Harm in La jongleuse

Adam B. Smith (IU Bloomington)

Recent critics have taken up the work of the Decadent author Rachilde as exemplary of the performativity of gender and sexuality *avant la lettre*, and analysis of the author’s fin-de-siècle novel, *La jongleuse* (The Juggler), has closely traced the agency exhibited by the protagonist, Eliante Donalger, in her sexual transgressions and perversity. However, there is an absence in the critical literature on this novel in regards to the threat of violence that the character of Léon Reille projects throughout the narrative. Drawing on Michel Foucault’s *Surveiller et Punir* (Discipline and Punish) and Anne McClintock’s *Imperial Leather: Race, Gender, and Sexuality in the Colonial Contest*, I propose that this threat imposes limits on the extra-normative life that Eliante attempts to create. Further, I propose that the agentiality critics have ascribed to the suicide that closes the novel is not derived from its semiotic impenetrability but from the fact that it is an act that directly resists the threat of violence. Eliante’s suicide responds to the violence and reasserts her agency to choose (or not) her extra-normative life.

Mentor: Margaret Gray, Department of French & Italian, IU College of Arts & Sciences, Bloomington

O20. Nicotinoid Clothianidin: Isolation and Detection within Local Honey Matrixes to Elucidate Environmental Impact in NWI Regions

Himali Patel and Ian Taschner (IU Northwest)

Colony collapse disorder (CCD) is a global issue associated with a drastic loss in honeybee population and among other things, has been attributed from the overuse of pesticides. Clothianidin, a common insecticide in the neonicotinoid family, structurally resembles that of nicotine, and has been shown to act like endocrine disrupting chemicals (EDCs) in newly emerged bees. Clothianidin was chosen due to its persistence and mobility in the environment and use in agricultural ecosystems in NWI. To address the contamination of clothianidin concentrations found in honey, development of an extraction and detection method was investigated. Honey, obtained from various apiaries in Northwest Indiana (NWI) was used in the study and clothianidin was extracted using an environmentally benign technique known as QuEChERs method. After extraction, the isolated pesticide was introduced to tandem liquid chromatography-mass spectrometry-mass spectrometry, which provided both qualitative and quantitative pesticide profiles. Through this research, detection of clothianidin in NWI honey samples will raise awareness on the overuse of neonicotinoids including its persistence and accumulation in the environment and highlight the emerging problem of colony collapse disorder and the decline of honeybees in our local community.

Mentors: Ian Taschner, Department of Chemistry/Biochemistry/Physics/Astronomy, College of Arts and Sciences, IU Northwest; Tia Walker, Department of Chemistry/ Biochemistry/ Physics/

O21. The Magic and Mysticism in the Created World of Yayoi Kusama and Niki De Saint Phalle

Olivia Doyon (IU Southeast)

Niki de Saint Phalle and Yayoi Kusama are female artists who in their careers have made an extraordinary breadth of work, each of them starting in the second half of the twentieth-century and spanning into contemporary times. Kusama coming from Japan and de Saint Phalle from France, these two female artists have lead much different lives but both explored similar planes of modern existence. Though their works deal with different subjects and display different visual motifs, they both possess an overarching ability to create their own fantastical worlds through their installations and sculptural works. Through the lense of feminism, this paper will uncover how these created playful, otherworldly and magical spaces evoke a liberating space for women.

Mentor: Barbara Kutis

O22. Bees: An Excursion into Literary Style, Making Money with Academic Creative Writing, and Research as a Fundamental Component of Novel Writing

Levi Dunn (IU Southeast)

This research works to combine fields such as: agriculture, decline of the honeybee, ancient history, modern social dynamics, domesticity, multiple modes of writing, modern science, antediluvian folklore, philosophy and metaphysics spanning centuries, and their use in developing a unique style of literary creative writing theory. Creative writers will want to attend this presentation, not only due to the techniques, concepts, and content that they will surely be interested in but also to learn how this opportunity has allowed the presenter to receive monetary compensation for his creative writing.

Mentor: Dr. Dement-Farmer

Oral Session F

O23. Sports in a Third World Country. More than just a sport?

Cameron Clark (IU Southeast)

What is the importance of the sports in the third world? Sports here in America stand for so much. Sports are used for recreation, stress relief, and even for social gathering. The purpose of this case study is to navigate through the sports world in a third world country. This will delve into other impoverished countries and reveal what sports are played elsewhere and the impact it has on the people and the state.

Mentor: Dr. James E. Hollenbeck, Department of Science Education, Indiana University Southeast

O24. Auto Immune Predispositions: Are Genetic or Environmental Factors to blame?

Wendy Headrick (IU Southeast)

This presentation will identify various Autoimmune Diseases or Deficiency's that are commonly diagnosed along with the factors that support a predisposition to these ailments as either environmental, genetic, historical or a combination. The research will focus on Crohns Disease and other Autoimmune Diseases like Multiple Sclerosis, Diabetes (Type 1), and Rheumatoid Arthritis to support predisposition claims. This investigation will research known predispositions and linkages associated with one disease versus another, and will also indicate what technology advances have been made to detect them within a timely manner to date.

Mentor: James Hollenbeck, Science and Technology in World History/Education, Indiana University Southeast

O25. The Impact of Institution Characteristics on Initial Job Placement in US Economics PhD programs

Li Liu (IU Bloomington)

This research investigates how doctoral students attending different programs will have different outcome for the initial job placement. Using the placement data of 110 US economics doctoral programs from 2010 to 2017, this paper shows that the placement quality in academia doesn't correlate the program ranking. The result from the logistic regression model is that programs characteristics such as student supports, cohort size and office space would be beneficial for students to get better positions. Also, the paper gives an analysis of how the rising demand for economists from private sectors would potentially influence the students' career choice and programs' training emphasis. These results would provide PhD applicants with better understanding of where they attend graduate school may change their career prospect.

Advisor: Juan Carlos Escanciano, Department of Economics, College of Arts & Science, IU Bloomington

O26. A Review of the BRICS Countries and How They Could Shake Up the World Economy

Don E. McCraig Jr., Darrell E. Brown (IUPUI)

The purpose of this research is to discover if the BRICS theory, which states that the BRICS countries (Brazil, Russia, India, China, and South Africa) will be the largest economies in the world by the year 2050, is still an accurate prediction after internal and external factors have created economic instability throughout each of the BRICS country. This research is a prediction of where the power balance will be in the next 33 years. These countries make up half of the world's population, and their combined GDP is roughly \$16.6 trillion, which is 22% of the world's GDP. If even one of these countries' economies is experiencing instability, it has a ripple effect to many places around the world. This can already be seen with China's GDP drop from 7.3% to 6.9% in 2014-15. With this change in their GDP, China began to buy fewer commodities, which effected countries such as Brazil and many countries in Africa, which they are still feeling the effects of to this day. Brazil is facing political/social instability on top of having their worst recession in over three decades. Russia went into recession in 2014, which has reduced their GDP by 3.7% on top of experiencing political tension with other countries around the world, and South Africa is being affected by lowered commodity prices as well, which is expected to lower their GDP growth rate. Out of all the BRICS countries, India is the only one that has a steady growth rate and is predicted to meet the expectations the BRICS theory coined in 2001. This research is still ongoing because of the nature of the subject, so a formal answer to the hypothesis hasn't been formulated yet, but through data analysis, a review of the current literature analysis, and the expertise of different experts in the field so far, it doesn't appear that the BRICS countries will be the largest economics in the world by the year 2050.

Mentor: Darrell E. Brown, Department of Management, Kelley School of Business, IUPUI

O27. Private Equity and Its Effects on Retailers

Jacey Stuckey (IUPUI)

This research seeks to determine if the degree to which the amount of debt may have contributed to popular retailers filing for bankruptcy, after being acquired by private equity firms. Toys R's Us, Circuit City, and Sports Authority are all major corporations that have two things in common. They have filed for bankruptcy and they are owned by private equity firms. There is more to this issue than customer loss. The financial statements tell a clearer story of what is happening. In buyouts, private equity companies acquire companies with debt and equity to increase returns for the investors, popularly using a method called the 60/40 Portfolio. The 60/40 Portfolio is when 60% of the company is acquired through equity and 40% debt. To determine the reasons these firms file for bankruptcy, analyzation of the financial statements for 2010-2015 is needed to establish growth patterns and identify significant changes. This is evaluated by changes in financial ratios like the profit margin, net income, debt to equity, current ratio, debt ratio, and return on equity. When companies are acquired, their work forces are often downsized, meaning layoffs, change in employee benefits, and store closure can also result. In conclusion, buyouts have had detrimental effects on common retailers. With the massive amounts of debt accumulated through operations, financing, and the initial buyout, companies struggle with their debt repayments, in addition to their other obligations. Thus, filing for bankruptcy and closing operations seems like the best decision for these once profitable and popular retailers.

Mentor: Peggy Daniels Lee

Oral Session G

O28. Probing for Lorentz Symmetry Violation in Electrons Using Trapped Yb+Ions

Noah Schlossberger (IU Bloomington)

Violations of local Lorentz invariance (LLI) are predicted by many physical theories beyond the standard model, which attempt to unify gravity with other fundamental forces. Using an analogue of the Michelson-Morley test with trapped Ca⁺ ions [Nature 517, 592–595 (2015)], the current bound for LLI of electrons is less than 1 part in 10¹⁸. By instead performing the measurements with Yb⁺ ions, which exhibit enhanced sensitivity to LLI breaking effects and much longer measurement times, we can push the bounds lower by 5 orders of magnitude. In this presentation, I outline an experimental configuration for such an experiment, laying out a measurement algorithm, addressing experimental concerns, and discussing necessary hardware. The experiment is specifically designed to utilize the existing iron trap apparatus in place at the Richerme lab at Indiana University Bloomington.

Mentor: Phil Richerme, Department of Physics, IU Bloomington

O29. Progress Towards the Total Synthesis of Ophiorrhisine A

Nicholas D. Miljevic, Ian Taschner (IU Northwest)

Ophiorrhisine A, a new macrocyclic peptide alkaloid, was isolated from the *Ophiorrhiza nutans* species distributed throughout Japan and Thailand. These plants are well known to produce diverse natural products including terpenoids, peptides, and alkaloids, which have displayed promise as potent antitumor agents. An achiral approach to the total synthesis of Ophiorrhisine A has been proposed through a twelve step convergent route. Starting with tyrosine, phenylalanine and methyl cinnamate, production of advanced intermediates proposed in the synthetic design of Ophiorrhisine A have been obtained stereoselectively in excellent yields. Synthetic progress to date has afforded an acyclic peptide, which, upon closure and amide coupling, would furnish the final macrocyclic natural product, Ophiorrhisine A.

Mentor: Ian Taschner, Department of Chemistry/Biochemistry/Physics/Astronomy, College of Arts and Sciences, IU Northwest

O30. Assessing Concentration Levels of Imidacloprid in NWI Honey Samples

Alex Solivais (IU Northwest)

Imidacloprid is a widely used pesticide that has been shown to affect honeybee behavior, increase bee mortality rates, and negatively impact colony health. Imidacloprid belongs to a class of pesticides known as neonicotinoids: Neurotoxins that specifically target insects. This study will evaluate the concentration of imidacloprid found in the honey of local hives. This will provide additional evidence for neonicotinoid contamination within apiaries and hives in Northwest Indiana. Imidacloprid will be isolated from a honey matrix using QuEChERS method. This extraction method is environmentally friendly and can be performed using small solvent volumes. The extracted imidacloprid will be quantified through tandem liquid chromatograph-mass spectroscopy. The increasing evidence of neonicotinoid presence in honey raises concerns. By providing beekeepers and apiary owners pesticide profiles for their honey, they will be better equipped to handle the challenges, such as Colony Collapse Disorder, facing them today.

Mentor: Dr. Ian Taschner, Department of Chemistry/Biochemistry/Physics/Astronomy, College of Arts and Sciences, IU Northwest

O31. Predicting for Fun and Hopefully Profit

Justin Butler (IU Southeast)

Data powers everything that we do. Data science has become a research rich field of data analysis. Predictive analysis –the technology that learns from data to predict future behaviors is a vital technology in data science. The aim of this project is to be able to accurately predict future prices of items traded in an online gaming market. We use a gaming market because the prices are not affected by extreme market factors that affect the real-world stock markets. We utilize gradient descent algorithm to develop our predictive model. Finally, we present a comparative analysis of our model.

Mentor: Suranga D Hettiarachchi, Department of Computer Science, IU Southeast

O32. Quantifying the Relationship between Ozone and Meteorology during the Arctic Spring

Meeta V. Cesler-Maloney (IU Southeast), John W. Halfacre, Paul B. Shepson, Peter K. Peterson, William R. Simpson, Bo Li, Jan W. Bottenheim, Stoyka Netcheva, Donald K. Perovich, Patricia A. Matrai

Surface-level ozone in the Arctic has been observed to decrease to near zero levels during spring by photochemical reactions between ozone and halogen radicals. However, the extent to which observed ozone variability results from chemistry or advection of ozone-poor air remains inadequately understood. In this study, the relationship between meteorology and surface-level ozone depletion over the Arctic Ocean was explored quantitatively using linear and nonlinear regression models. Three sets of O-Buoy-based, Arctic Ocean measurements from April of 2011, 2012 and 2014 were analyzed to quantify the effects of temperature, relative humidity, wind speed, and atmospheric pressure on ozone mole fractions. Linear regression models showed good explanatory power between ozone and meteorology during periods of ozone decrease, with $R^2 \geq 0.6$ for each variable. For periods of ozone increase, only temperature ($R^2 = 0.75$) and relative humidity ($R^2 = 0.71$) showed good predictive power across observation sites. In addition, data from five non-linear models, including all meteorological variables, correctly predicted ozone measurements $< 2 \text{ nmol mol}^{-1}$ for more than 70% of observations in 2011 and 80% in 2012. These results show a significant relationship between observed ozone concentrations in the Arctic and meteorology, consistent with an Arctic Ocean atmosphere that is stable and widely ozone-depleted, though no variable appears to singularly explain the observed ozone depletion. Further analysis on O-Buoy data is necessary to better understand the relative contributions of meteorology and chemistry to observed ozone variation.

Mentor: John W. Halfacre, Indiana University Southeast, Department of Chemistry, IU Southeast

Oral Session H

O33. Trenches, Nukes, and the Forgotten Helicopter

Dakota Hendrick (IU Southeast)

Throughout the course of history humans have used monumental technological advances to define and classify specific wars, and eras. For example, World War I and trench warfare, The atomic bomb and World War II, and lastly chemical warfare and the Vietnam War. However, while these technological discoveries are paramount to the evolution of warfare, they often overshadow the importance and dependability of other technological discoveries. Helicopters are long forgotten tools in warfare that are often overlooked by individuals. The purpose of this research is to explore both primary and secondary sources that thoroughly discuss the importance and unique qualities of tasks performed by helicopters. I plan on interrogating these sources gathering information to speak on the versatility of helicopters in combat, retrieval missions, and resource transportation into warzones. Some military personnel would suggest that there are specific missions that could only be performed and completed by helicopters; therefore, my working conclusion is that helicopters are worthy of admiration and respect. Warfare has been forever changed by the discovery of the helicopter. I believe that there should be more time spent discussing the significance of the task performed by helicopters in all modes of warfare, whether it be combat, transportation, or sheer adaptability.

Advisor: James Hollenbeck, School of Education, IU Southeast

O34. Mother Jones did not die on the cross so you that could 'spout this mess to me: Appalachian Migration Patterns and the Industrial Expansion (1880-1914)

Brandon Zellers (IU Southeast)

This research and presentation illuminates the broader system of oppression and exploitation of Appalachian land, as well as the people who have inhabited these sacred lands through the lens of the migration patterns concerning Appalachian labor between the years 1880-1914. The history of the Appalachian region is criminally underrepresented in American curricula, contrary to the importance of exported Appalachian coal during the industrial revolution. This time in our nation's history forever changed the political realities of every single American. This comparative research study examines the town of Cades Cove, TN, a small Appalachian community that was ripped away from its inhabitants via eminent domain, and other Appalachian towns whose primary sources indicate extraordinary patterns of wealth distribution and land ownership. By better understanding Appalachian migration patterns that began during the antebellum period and extended through the industrial revolution (1880-1914), this research seeks to construct a foundation of discernment concerning the political realities of the Appalachian body politic and to illustrate some of the historical inequalities of the Appalachian economy. I hypothesize that Appalachia has always been a region characterized by its sense of communal struggle against outside economic interests.

Mentor: Quinn Dauer, Department of History, IU Southeast

O35. College Students' Perspective of Debt as Risk

Colton Wade (IU Southeast)

College students are unprepared for the financial decisions awaiting them at the start of their college career and by the time they are out, many have acquired a fair amount of debt. This unpreparedness can lead to bad financial behaviors, increased stress, and less studying. The present research study looked to measure how much students view debt as a risk and other contributing demographics to both risk and debt aversion. Using an online survey, participant's risk tolerance scores were compared to their debt aversion scores. Demographic information was also tested against both risk tolerance and debt aversion scores. The following research proposal hopes to contribute to new policies or serve as a stepping stone towards a more useful tool for professionals to use to guide future college students through a financially healthy college journey.

Mentor: Deborah Finkel, Department of Psychology, IU Southeast

O36. Coloring Mandalas as a Coping Mechanism for Anxiety in Men and Women.

Danielle Marr, Rachel Hamilton (IU Southeast)

The current study looked at anxiety differences between males and females and coloring as a coping mechanism. Curry and Kasser (2005) found that coloring mandalas reduced anxiety but did not examine gender differences. The current study looked at the effect of coloring on genders to fill the research gap. For participants, at least 25 female and 25 male participants are needed from the freshman psychology subject pool. The State-Trait Anxiety Inventory (STAI) will be used to test the participants' anxiety levels in that moment before and after the study (Spielberger, 1970). A sheet of multiplication problems and long division were used to induce anxiety. The mandala used was found in the Curry and Kasser (2005) study. We expect to find results that are similar to the hypothesis, that females will have less anxiety than males. If the results support the hypothesis, then the study will have closed the information gap on coloring and gender.

Mentor: Deborah Finkel, Department of Psychology, IU Southeast

O37. "What God Hath Wrought": The internet and Social media; the potential issues for U.S. Society.

Aric Miller (IU Southeast)

Although information and communication are generally perceived as positive in society, the Internet and social media have contributed to social division among citizens which has become potentially harmful to the value systems of the United States' society; without regulation, quality education for the citizens, and stricter accountability for online users, social issues surrounding the internet and social media will only continue to worsen.

Mentor: James Hollenbeck, School of Education, IU Southeast

Oral Session I

O38. Corticosterone Regulation of PDE10A Expression in Male and Female Rats

Juan M. Sanchez, Shannon L. Roy, Sean Gainey; Marian L. Logrip (IUPUI)

Stressful experiences can result in high alcohol drinking and dependence. Identifying pathways that control alcohol consumption can facilitate medication development to improve treatment options. Past studies show a relationship between stress-induced drinking and an increase in phosphodiesterase 10A (Pde10a) gene expression in male rats. However, the cause of this phenomenon is not known. This experiment studied whether repeated increases in corticosterone are the mechanism that causes elevation in Pde10a gene expression in the amygdala and prefrontal cortex. To mimic the physiological effects of repeated stress, male and female Wistar rats (n=12/ group) were subjected to one corticosterone injection (5mg/kg) or its vehicle control per day for 3 consecutive days. Brain regions of interest were collected 24 hours later for mRNA and protein expression analysis. No differences were found in Pde10a mRNA levels in the basolateral amygdala between the corticosterone treated and control female rats. However, the male controls had higher Pde10a compared to treated male rats, whose mRNA Pde10a levels were as low as in female rats. In the BLA there were no significant effects of corticosterone on PDE10A protein expression. However, there was a significant reduction of phosphorylated ERK (pERK) in both sexes after corticosterone. In the CeA, corticosterone decreased both PDE10A and pERK protein expression compared to the control group in both sexes. No significant effect on PDE10A protein expression was seen in the ilPFC. However, corticosterone treatment decreased pERK in males but not females. These findings show sex differences in corticosterone regulation of two parallel signaling pathways.

Mentor: Marian L. Logrip, Department of Psychology, School of Science, IUPUI

O39. Assessment of TLR-2 expression in salivary epithelial cells for early identification of periodontitis.

Alison Lindsay and Mythily Srinivasan (IUPUI)

Periodontitis is one of the most common inflammatory diseases in humans that cause destruction of the tooth supporting tissues and ultimately tooth loss. It is estimated that 15%-20% of adults in the United States suffer from severe form of periodontitis. Furthermore, periodontal inflammation is a significant risk factor for systemic pathologies including cardiovascular disease, diabetes and arthritis. Currently available methods of diagnosing periodontitis accurately measure the accumulated tissue damage but provide little information on disease activity. Surface epithelial cells of the gingiva, buccal mucosa, tongue and palate host periodontal pathogens intracellularly. Microbial invasion can increase proliferation and/or reduce apoptosis leading to rapid turnover and epithelial exfoliation. As the first cells in contact with oral bacteria, epithelial cells express toll like receptors (TLR)-2 and TLR-4 that mediate response to periodontal pathogens. These cells reach saliva by exfoliation. We hypothesized epithelial cells in saliva could provide a solution to the puzzle that connects persistence of periodontal pathogens, re-infection and tissue destruction. To test the hypothesis we compared the pool of epithelial cells in the archived unstimulated whole saliva samples collected from individuals with gingivitis or chronic periodontitis after obtaining informed consent. The expression of TLR-2 and TLR-4 was measured by real time polymerase chain reaction. Our results show that the number of epithelial cells was increased and the TLR-2 expression was lower in periodontitis saliva. In conclusion, epithelial cells in saliva could represent valid biospecimen for detection of periodontitis.

Mentor: Mythily Srinivasan, Associate Professor, Department of Oral Pathology, Medicine and Radiology, School of Dentistry, IUPUI

O40. Using a mathematical model of sepsis to predict survivability conditions for an infection

Elefteria C. Onwuaduegbo, Julia Arciero, Jared Barber (IUPUI)

Sepsis is a life-threatening illness resulting from an overwhelming immune response to an infection. While the immune response (inflammation) is a necessary response to an infection, it can also cause significant damage to normal tissues and cells in the body. The complex balance between helpful and harmful inflammation can either lead to clearance of an infection or sustained inflammation. To understand this complex interplay between inflammation and infection, a mathematical model of a bacterial infection is developed. Model parameters are determined from experiments in which large amounts of bacteria are injected into rats. The model uses a system of five ordinary differential equations that tracks levels of bacteria, pro-inflammatory and anti-inflammatory immune cells, and inflammatory damage. Analyzing the steady states and dynamics of the model allows for the determination of ranges of parameter values that produce qualitatively different behaviors including healthy, septic death (high levels of bacteria present), and aseptic death (bacterial clearance but a highly inflamed state) outcomes. The results of this study will improve the understanding of conditions in vivo that lead to sepsis or survivability of an infection.

Mentors: Jared Barber and Julia Arciero, Department of Mathematical Sciences, School of Science, IUPUI.

O41. Detecting Antibiotic-Resistant Bacteria in the Human Microbiome

Harleen K. Aujla and Jenny C. Fisher (IU Northwest)

The extensive use of antibiotics has led to the emergence of antibiotic-resistant bacteria. Antibiotic resistant pathogens are of the greatest concern, but some commensal (harmless) bacteria can acquire antibiotic resistance through random mutations or by sharing the genes that confer resistance. Sewage collects commensal bacteria that are shed from the human gut through feces, and therefore, the bacteria in sanitary sewers can be used to analyze the human-associated bacteria community at the population level. The bacteria in sewage can also be used to examine their resistance to certain antibiotics. We grew sewage samples on fecal coliform (FC) medium and added antibiotics to the medium to select for antibiotic resistant bacteria. Enteric bacteria showed resistance to several antibiotics including ampicillin (>100 %), tetracycline (~10 %), fosfomycin (~10%), and ciprofloxacin (~4 %), while most were sensitive to meropenem (>99 %). We performed a polymerase chain reaction (PCR) assay on fosfomycin-resistant bacterial isolates to detect the presence of *fosA* gene that provides resistance to fosfomycin. The *fosA* gene inhibits the activity of the antibiotic by encoding an enzyme that adds a functional group to fosfomycin. Some isolates showed a positive result indicating the presence of *fosA* gene in their genome, while others were considered to obtain a different pathway that conferred them resistance to fosfomycin.

Mentor: Jenny C. Fisher, Department of Biology, College of Arts and Sciences, IU Northwest

O42. Using Chloroquine to Inhibit Autophagy and Increase Pancreatic Cancer Radiation Sensitivity

Joseph W. Boone, Helen Chin-Sinex, Marc S. Mendonca (IUPUI)

Pancreatic cancer (PDAC) is the third leading cause of cancer deaths in the United States. With a 5-year survival rate of 9%, PDAC needs novel approaches to improve therapeutic outcome. The low survival rates of PDAC are attributed to detection at advanced stage and very high chemo and radiation resistance. Our recent data suggest that simultaneous inhibition of the pro-survival NF- κ B signaling pathway and Warburg cancer metabolism (oxidative glycolysis) can sensitize pancreatic cancer to radiation-induced cell killing. Interestingly, inhibiting these two pathways appears to also alter and perhaps inhibit autophagy. Autophagy is a process utilized by cancer cells to recycle damaged organelles and proteins to supply basic building blocks such as amino acids, fatty acids, nucleotides to support rapid pancreatic cancer cell growth. We hypothesized that inhibition of NF- κ B and Warburg metabolism inhibited autophagy and sensitize PDAC cells to radiation-induced cell killing. Chloroquine (CQ) a drug commonly used for treating malaria has been shown to inhibit autophagy in cancer cells. In this current study, we are investigating whether inhibition of autophagy with CQ could alter pancreatic cancer sensitivity to radiation-induced cell killing in the AsPc-1 pancreatic cancer cell line.

Mentors: Helen Chin-Sinex, Department of Radiation Oncology, IU School of Medicine; Marc S. Mendonca, Department of Radiation Oncology, Department of Medical and Molecular Genetics, IU School of Medicine

Oral Session J

O43. Emotional Intelligence and Being Raised in a Household with an Individual with a Disability

Loren Burke and Bailey Couch (IU Southeast)

The following research was done to look at the emotional intelligence of people who were raised in the same household as individuals with cognitive and physical disabilities. The Schutte Self-Report Emotional Intelligence Test (SSEIT) was used to measure emotional intelligence. Participants were asked a series of questions about their family structure in relation to individuals with disabilities in a one-time online survey. The expected outcome is that participants raised with individuals with any type of disability will have a higher emotional intelligence than those raised without an individual with disability. Within disability types, it is expected that participants raised with an individual with cognitive disabilities will have the highest emotional intelligence, those with both emotional and physical disabilities will have the second highest emotional intelligence, followed by those raised with physical disabilities. The hope of the results of this research is to provide support for the idea that there are positive outcomes to being raised around individuals with differing needs. As this is a growing population, it is imperative that the medical community and other supports are aware of ways to better help and provide aid to families of individuals with any type of disability.

Mentor: Deborah Finkel, Department of Psychology, IU Southeast

O44. Effects of Anxiety on Academic Performance, Measured In College Students

Ashley Brown, Brianna Carlquist, Allison Sliter (IU Southeast)

In this study academic performance and anxiety were the variables of interest. Previous studies have only looked at the link between test anxiety and GPA. For our study we will look at different levels of academic performance such as class attendance, class participation, campus engagement, completion time, as well as GPA, in addition we are looking at trait anxiety instead of test anxiety. It is hypothesized that women with medium levels of trait anxiety will have better academic performance than women with low or high anxiety. It is also hypothesized that anxiety level will not have an impact on academic performance on men. Being college students, this study was of interest to us because it is more common than not to have anxiety in college and we know a lot of college students that possess this personality trait. We expect to find data that supports our hypothesis.

Mentor: Deborah Finkel, Department of Psychology, IU Southeast

O45. A Qualitative Study of Student Engagement with Online Courses: Strategies and Practices

Alice Dickey, Derrick Hutton-Kinsey, **Paloma Maldonado**, Mackenzie Schoon (IU Northwest)

While ubiquitous, online classes are a relatively new phenomena in post-secondary schooling. Research on student engagement in online environments is growing rapidly, however much of this work is quantitative. This study uses a qualitative design to assess differences in student engagement in online courses in the Canvas learning system. We conducted 40 formal interviews with fellow students that are currently enrolled in at least one online course. All interviews were recorded, transcribed and analyzed for content. We draw on this data set to provide a rich description of practical activities and strategies students employ in the online learning environment. We also unpack participants' native concepts like "busywork" and "outside resources" to critique assumptions about education online. We hope insights from this research can contribute to the ongoing conversation on student engagement and pedagogy for learning management systems.

Mentor: Kevin L. McElmurry, Department of Anthropology and Sociology, College of Arts and Sciences, IU Northwest

O46. The Influence of Religiosity on Sexual Behaviors and Attitudes

Emily Fleming and Lindsay Begley (IU Southeast)

This study examined correlations between religious activity and sexual behaviors and activity, as well as permissive attitudes. In our more modern society, people are more outspoken about sexuality. Therefore, the study was conducted to find if religiosity still had a strong effect on college students' sexual behaviors and attitudes. An online survey, consisting of four questionnaires, was used to determine the correlations between religious activity and sexual behaviors and activity. The results showed that the participants with high levels of religious participation engaged in less sexual activity than the participants with low to medium levels of religious participation. The results also showed that men with high levels of religious participation had the least permissive attitudes towards sexual behavior and activities. The results provided evidence that religious participation still has a significant influence on college students' sexual behaviors and attitudes. While western society has become more progressive in its cultural attitudes towards sexuality, religion is still a predominate factor in the way in which individuals express their sexuality.

Mentor: Deborah Finkel, Department of Psychology, IU Southeast

O47. Efficacy of Antidepressant Medication

Reuben Nehrt (IU Southeast)

SSRI's or antidepressants are now one of the top drugs millions of Americans take to treat their depression and anxiety. An important question is, why are so many people reporting depression and in need of medication? Important, yes, but not the concern for this project. I am concerned with the efficacy of these drugs. How are they tested? So far, I have found SSRI (Selective Serotonin Reuptake Inhibitors) drugs are tested against placebos. I found this fascinating considering a placebo is a simulated medication or treatment relying only on the 'placebo effect' or the phenomena that some patients' symptoms are alleviated by an 'fake 'treatment. Some studies suggest that placebos are nearly as effective as antidepressants whenever the depression or anxiety is mild. If the SSRI medication is slightly better than a placebo, then how would the drugs compare against regular exercise? Exercise releases the same neurotransmitters that antidepressant medications do, only it is achieved naturally without the added side effects.

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

Oral Session K

O48. Analysis of Me31B Protein localization During Egg Development Through RNAi

Hunter DeHaan, Brittney Armstrong, Carlie Cruse, Ming Gao (IU Northwest)

In *Drosophila* (fruit fly), Me31B is an essential protein for the development of the egg. Me31B functions in germ granules, specialized ribonucleoprotein complexes involved in RNA post-transcriptional regulation. To further understand composition and assembly mechanism of the Me31B containing germ granules, we conducted an *in vivo* interactome analysis of Me31B. In the interactome, we identified many germline proteins including conserved germ granule protein Tudor (Tud), Vasa (Vas), and Aubergine (Aub). We hypothesized that these Me31B-interacting proteins may recruit Me31B to the germ granule. Therefore, we first examined the localization pattern of Me31B and the three core germ plasm proteins. We found that Me31B likely co-localized with these proteins in the nuage granules of the nurse cells and the germ plasm granules of the oocytes. We further analyzed Me31B's localization in *vas* and *tud* mutants. Surprisingly, Me31B's recruitment to the germ granules was not affected in the absence of Vas or Tud. We concluded that Me31B interacts with germ granule protein Tud, Vas, Aub; however Vas and Tud are not required for Me31B's localization to the germ granules. Using RNA interference (RNAi), a gene knock down technique, we are currently analyzing other candidate genes to screen for the ones that affect Me31B's recruitment to germ granules.

Mentor: Ming Gao, Biology Department, IU Northwest

O49. Identifying The Me31B Complex Components In Germ Granules

Aidan McCambridge, Hunter DeHaan, Ming Gao (IU Northwest)

Me31B protein, an ATP-dependent RNA helicase, is an essential protein for germ cell development. In *Drosophila Melanogaster* (fruit fly) model system, Me31B complex with other RNAs and proteins to form germ granules that determines germ cell formation. By understanding how Me31B interacts with other molecules in these granules, a deeper understanding of how Me31B affects the germ granules' functions can be discovered. To analyze this interactome, an *in vivo*- proteomics analysis was conducted on Me31B-GFP (Green fluorescent protein) expressing fly ovaries. We chemically cross-linked and isolated the Me31B complexes from the ovaries, and the complex components were identified by mass spectrometry. We found four groups of proteins: RNA regulation proteins, glycolytic enzymes, cytoskeleton/motor proteins, and germ plasm components. This interactome supports Me31B's function as a translational repressor and a key germ plasm protein. Future research is planned for a proteomics study of the Me31B interactome in *Drosophila* embryos. This embryo Me31B interactome will be compared to that of the ovaries. By comparing these studies, the dynamics of Me31B germ granules can be uncovered in different developmental stages from egg development to early embryo development.

Mentor: Ming Gao, Biology Department, IU Northwest

O50. Isolating, Purifying, and Genetically Identifying Novel Bacteriophages from Southern Indiana Water Samples

Angela Sabo (IU Southeast)

Bacteriophages (phages) are viruses that infect and kill bacteria. Recently, phage biology and genomics have become an area of immense interest due to emerging information about host-virus interactions and the striking potential of phage therapy as an alternative to antibiotics. In order to help characterize phages and understand how they interact with their hosts, we are building a collection of newly isolated phages that infect *Caulobacter* and *Asticcacaulis* species to further study phage diversity and host specificity. Water samples collected from Southern Indiana were filtered through 0.2 µm filters to isolate the phages. Host bacterial cultures were plated using a soft agar overlay and the sample filtrate was spotted onto each bacterial lawn to test for phage activity. Phages were purified from positive samples by a five-fold reinfection process. High titer stocks were prepared to enable further analysis using TEM imaging, DNA extractions, and restriction enzyme digests. Currently, TEM images of eighteen out of twenty phages have been obtained, showing all to have flexible non-contractile tails characteristic of the siphoviridae family. DNA extractions, using a modified Promega Wizard DNA Clean Up System, and restriction enzyme digestions, using a set of five enzymes, are ongoing as we prepare for genome sequencing, annotation, and analysis. Current results suggest that nearly all independently isolated phages are unique. Adding genome data from this set of novel *Caulobacter* and *Asticcacaulis* phages to other phages already described in the literature will build on our understanding of phage diversity, with potential insight into host specificity.

Mentor: Pamela Connerly, Department of Biology, IU Southeast

O51. Type II Diabetes and Obesity Resulting from Irregular Sleep Cycles

Ishani Sharma (IU Northwest)

In today's society, the prevalence of Type II Diabetes Mellitus and obesity has seen a sharp increase, especially among adolescents. Numerous hormonal and other physiological changes occur throughout the day and are especially apparent when compared between periods of sleep and wakefulness. This includes reduced heart rate, blood pressure, sympathetic nervous activity, and glucose metabolism; and an increase in vagal tone. Several hormones contribute to blood sugar levels including insulin, growth hormone, and cortisol. In a healthy individual, the body's ability to metabolize glucose fluctuates through out he day, following a circadian-like pattern. The body's glucose tolerance follows insulin secretion patterns. As insulin levels rise during the day, so does the glucose tolerance, and when insulin levels are at a minimum in the middle of the night, so is glucose tolerance. Likewise, cortisol, which increases blood sugar levels is reduced during sleep whereas growth hormone peaks at night. This study used a literature-based approach to examine the correlation of Type II Diabetes Mellitus and obesity with irregular sleep cycles. Data from published clinical trials indicate that individuals who receive less sleep than recommended have an increased risk of Type II Diabetes Mellitus due to hormone imbalances. Hormonal alterations also caused increased appetite, which lead to an increased risk of obesity and diabetes. This suggests that there is a direct correlation between sleep imbalance with Type II Diabetes Mellitus and obesity, and the data indicates that the two diseases are comorbidities.

Mentor: Michael S. LaPointe, Department of Biology, IU Northwest

O52. Studying the Interaction Mechanism Between Germline Proteins Me31B and Tudor

Dhruv Solanki, Hunter DeHaan, Ming Gao (IU Northwest)

Me31B is an essential protein for germ cell development. Me31B is an ATP dependent RNA helicase that plays a part in translational repression of RNAs during egg development. In egg development, Me31B associates with another essential germ cell protein, Tudor, and this interaction is believed to be crucial for germ cell formation. However, the interaction mechanism is not known. Our previous study showed that Me31B likely interacts with Tudor through symmetrically dimethylated arginine (sDMA) residues. To find which sDMA(s) are mediating the interaction, we utilized a site directed mutagenesis method to mutate the six arginine codons of me31B gene to lysine codons. Then, the mutant me31B genes were introduced to S2 cell expression system to produce mutant Me31B proteins. Currently, we are using a sDMA recognizing antibody to check for the presence of sDMA in the mutant Me31B proteins. In future projects, we plan to test the interaction of the Me31B mutant proteins and Tudor in a binding assay. These experiments will shed light on the interaction mechanism between Me31B and Tudor proteins and help us understand the importance of this interaction for egg development.

Mentor: Ming Gao, Department of Biology, IU Northwest

Oral Session L

O53. Visualizing the Visceral: Works by Rachael Bailey

Rachael L. Bailey (IU Southeast)

Human beings are emotive creatures—it is in our very nature and essence. Culture and society, however, stigmatizes emotional experiences such as stress, depression, and anxiety. This inhibits the individual expression, and thus handling, of such emotions, which leads to harmful and often self-destructive results. As an IU Southeast Undergraduate Student Fellowship recipient, I approached this issue from a creative and artistic perspective. I sought to represent the experiences of stress, anxiety, and depression as external expressions and internal narratives. My goal was to start a conversation of these emotional states—to show individuals that these conditions and experiences are more than simply human; they are normal and can be a beautiful part of life. Utilizing both realistic rendering and expressive marks and media, I created works meant to evoke an emotive response within the viewer, to create something familiar and visceral. I used images of the body as well as objects, placed next to abstract marks and materials to create a unified narrative of what one feels within the body as well as what is expressed to the world. I exhibited these works as an invited solo exhibitor at Silica Ceramic Studio and Gallery in Jeffersonville, IN, as well as at IU Southeast—thus, reaching a broad audience in the area. Witnessing and hearing viewer’s reactions enforced that these experiences need to be talked about and represented in a realistic way.

Mentor: Emily Sheehan, Department of Drawing, IU School of Arts and Letters, IU Southeast

O54. The Role of Inmate-Centered Prison Theatre Arts Programs in Community Development

Anna Guse (IU Bloomington)

In recent years, prisons have increasingly established inmate-centered theatre arts programs. Such programs are established to develop the interpersonal and intrapersonal relationship skills of the inmates, and evidence has shown that exposure to the arts while in prison reduces the rate of recidivism among former inmates. A study by Larry Brewster displays evidence of improved “life effectiveness attitudes” and “greater participation in academic and vocation programs” among inmates who had participated in an arts program while imprisoned. Still, the arguments of scholars like Brewster focus on arts programs as a whole, and little research has been done to identify the impact of inmate-centered prison theatre programs specifically. My paper addresses the social impact of inmate-centered prison theatre programs, with an emphasis on its purpose in community development. I will examine several successful theatre arts integration programs in prisons and discuss their means of accomplishing these goals, while gathering individual and collective stories and data of prisoners (both current and former) relating to the impact of theatre in their lives. I argue that theatre in prison is an inherently collaborative act that allows for the development of communities, intersectionality among former divisions of race or gang formation, and an increased sense of individual worth. In conclusion, this paper examines how theatre serves to break down the stigma of inmates as hardened, flawed criminals, and allows them to explore their personal lives and relationships in an environment that is notoriously impersonal, shedding new light on theatre’s role in community development.

Mentor: Eleanor Owicki, Department of Theatre, Drama, and Contemporary Dance, College of Arts and Sciences, IU Bloomington

O55. Looking Longer

Kathryn Combs (IU Southeast)

Looking Longer is a creative project that combined eye tracking and heat map software, both commercial applications, with art to create unique screen prints that show the viewer where a volunteer was looking within the original piece. Fifteen volunteers watched a slideshow of artworks, advancing to the next piece at their leisure while a webcam recorded the path of their eye movement. This path was translated to a heat map that visually represents where the volunteer looked and for how long using clouds of color in a cool to warm scale where blue is a quick look and orange or red is an intense stare. The heat maps were then layered over the original artwork and converted to a four color CMYK screen print. Screen prints were chosen because of their long history with mass production and because of the ability to use transparent base in the ink to control the vibrancy and opacity of the colors in the image. The final product of the project was seven screen prints, each named for the person whose eye path is represented in the artwork.

Mentor: Susanna Crum, School of Arts and Letters, IU Southeast

O56. Woman displayed in everyday activities

Hallie Martin (IU Southeast)

This paper focuses on the French Impressionists and discusses how Claude Monet, Edgar Degas, Edouard Manet, and Gustave Caillebotte represented women in their work. To develop this argument, I will discuss the history of impressionism, its relation to realism, and modern France. By concentrating on scenes of women in their everyday lives, I will show how these artists conveyed the lives of women. I will discuss realism, and how this differed from the past. I will also discuss modern France, and the woman living during the time. I will argue that the French Impressionist painted women of different classes in everyday scenes.

O57. The Positive Influence of the Writing Fellows Program on Professor, Fellow, and Students.

Levi Dunn (IU Southeast)

This presentation discusses the benefit of IU Southeast's new Fellows program devised and implemented by the university's writing center. The presenter works in tandem with a professor and is used to compliment the teacher: providing understanding and approachability in an effort to increase retention. Due to his being the only fellow of three who is assigned to a professor outside of the program's two architects he believes that his information is both valuable and by comparison with a second fellow, unbiased. He will discuss his duties, the struggles to improve the program, and both the benefits and flaws of the program while suggesting improvement options. The main focus of the presentation is to dissect the experience and display the mostly positive impact the program has had on those who are affected by it most: the professor, the student, and the writing fellow.

Mentor: Professor Leigh Ann Meyer, Writing Center Director and Associate, IU Southeast