A Letter from the Dean

Welcome to the tenth annual College of Arts & Sciences Undergraduate Research and Creative Activity Symposium at Ashland University! This opportunity for students to present their scholarly and creative work has become a signature event in our college. Following the format of a professional conference, students will present original research, perform theatrical and musical selections, read original creative writing, and exhibit their artwork. CAS undergraduate students continue to make original intellectual and creative contributions to their disciplines early in their careers.

Undergraduate research and creative activity mentored by a faculty member, or in collaboration with a faculty member, enhances the educational experiences of our students. Engaged students present research at professional conferences; author and/or co-author publications in professional journals; compete and perform at state, regional and national levels; and exhibit work in a variety of venues.

Students who participate in undergraduate research and creative activity demonstrate increased persistence in the pursuit of an undergraduate degree, are more apt to pursue a graduate education, and report greater preparation for carrying out research, acquiring information and speaking effectively.

Faculty and students in the College of Arts & Sciences share a joy of learning that frequently translates into life-long professional relationships. We are delighted to share with you highlights of the outstanding work being conducted by our students in departments across the fine and performing arts, humanities, natural science and social science disciplines. Enjoy the day!

All the best,

Dawn R. Weber, Dean
College of Arts & Sciences
Undergraduate Research and Creative Activity Symposium

April 9, 2019
John C. Myers Convocation Center
The College of Arts & Sciences at Ashland

The College of Arts & Sciences is a vibrant academic community at the heart of the university undergraduate experience. Grounded in liberal arts, students prepare for careers in science, business, the arts, education, communication, government and service organizations as well as for professional programs and graduate school.

Ashland University Mission Statement

Ashland University, guided by our Christian heritage, is a comprehensive, private university that provides a transformative learning experience, shaping graduates who work, serve and lead with integrity in their local, national, and global communities.

Undergraduate Research and Creative Activity Symposium Committee

Chair, Dr. Jeff Weidenhamer, Trustees’ Distinguished Professor, Chemistry
Dr. Christopher Burkett, Associate Professor, Political Science
Dr. Christopher Chartier, Associate Professor, Psychology
Dr. Hilary Donatini, Associate Professor, English
Dr. Scott Garlock, Professor, Music
Dr. Wendy Schaller, Associate Professor, Art
Dr. Gordon Swain, Professor, Mathematics
Sara Garska, Administrative Assistant (Program Design and Layout)
Contents

Oral Session I
9:00-10:15 a.m.
Trustees Room
Alexis Lough ................................................................. 8
Jennifer Winkler ......................................................... 9
Brianna Sargent ........................................................... 10
Jennifer Tully ............................................................... 11

Oral Session II
10:30-11:30 a.m.
Trustees Room
Kiana Ziegler ............................................................... 14
Nicholas Bloxsom ......................................................... 15
Jessie Ornelas ............................................................... 16
Emily Nicholls ............................................................. 17

Oral Session III
10:30-11:30 a.m.
Faculty Room
Corianna Borton .......................................................... 20
Shelby Aulger ............................................................... 21
Kaylei Ruffing ............................................................. 22
Kaitlyn Bailey ............................................................. 23
Poster/Exhibition Session I
11:45-12:45 p.m.
Alumni Room

Dana Awlia .......................................................... 26
Lauren Bood .......................................................... 27
Taylor Bunce .......................................................... 28
Ryan Curtis ............................................................. 29
Dominique Drake & Shelby Reutter ......................... 30
Mallorie Harding ..................................................... 31
Maria Kern ............................................................. 32
Bryce McClish & Elizabeth Takacs ......................... 33
Kaitlyn Moore ......................................................... 34
Scarlet Snow .......................................................... 35
Erin Staley .............................................................. 36
Evan Thomae .......................................................... 37
Cait Davis, Sage Haines, Allison Montgomery, Michaela Ping, Madeline Rogowski, Robby Young, & Kiana Ziegler ......................... 38
Victoria Roddy ......................................................... 39

Poster/Exhibition Session II
12:45-1:45 p.m.
Alumni Room

Miranda Bielawski .................................................. 42
Brianna Brdicka ....................................................... 43
Katherine Conley .................................................... 44
Cameron Middis ....................................................... 45
Cillian Donahue ....................................................... 46
Alexis Flagg & Emily Fulk ....................................... 47
Emmaline Kepp ....................................................... 48
Savannah Lewis ....................................................... 49
Kaylei Ruffing & Tiffany Smolinski ......................... 50
Tyler Theaker ........................................................ 51
Jessica Wilson ........................................................ 52
Kiana Ziegler ........................................................ 53
Jennifer Winkler ..................................................... 54
Oral Session IV  
2:00-3:00 p.m.  
Trustees Room  
Abigail Dingus ................................................................. 56  
Audrey Saler ................................................................. 57  
Andrew L. Spies ........................................................... 58  
Naomi Sims ................................................................. 59  

Oral Session V  
2:00-3:00 p.m.  
Faculty Room  
Tyler Easton .................................................................... 62  
Hendrick Stoops ................................................................ 63  
Savannah Lewis ............................................................ 64  
Erin Staley ....................................................................... 65  

Oral Session VI  
3:15-4:15 p.m.  
Trustees Room  
Kaitlin Snider & Chelsea Myers ....................................... 68  
Elizabeth Grim .............................................................. 69  
Kennedy Estridge ............................................................ 70  
Hannah Drake, Natalie Bisignano & Tiffany Pryce .......... 71  

Oral Session VII  
3:15-4:15 p.m.  
Faculty Room  
Kaitlyn Dailey .................................................................. 74  
Eric Watts ....................................................................... 75  
Allyson Lombardo .......................................................... 76  
Emily Martin ................................................................. 77
Oral Session I
9:00-10:15 a.m.
Trustees Room
Effects of Microplastic Exposure on the Freshwater Crustacean, *Daphnia magna*

Alexis Lough

Student’s Major: Forensic Biology
Faculty Sponsors: Dr. Jenna Dolhi Binder & Dr. Patricia Saunders, Biology

Plastic pollution has been a growing global issue since the production and widespread consumption of plastic began more than 60 years ago. Over time, it is shown to be a detriment to all aspects of terrestrial and aquatic organisms. Microplastics are plastic pieces or fibers (less than 5 mm) that contaminate aquatic systems and may impact zooplankton, aquatic animals that naturally ingest food particles of a similar size. Additionally, zooplankton are fed on by fish, so organisms higher in the food web are likely to be indirectly impacted by zooplankton ingestion of microplastics. This study investigated the potential of the model zooplankton, *Daphnia magna*, to ingest microplastic spheres and microfibers through concentration and extended exposure experiments. *D. magna* readily ingested polystyrene spheres that are 50µm in size. Since *D. magna* demonstrated an affinity for sphere ingestion, these organisms were exposed to the more common contaminate, microfibers, to determine if ingestion occurred and if there were impacts on survival and reproduction. *Daphnia* exposure to low levels of microfibers over twenty days showed a reduction in the number of eggs generated in a clutch, reduction in the viability of neonates that gestate to term, and reduction in the overall lifespan of adults and neonates, despite a lack of fiber ingestion.
The Ideal Art Curriculum: Bridging the Gap between School and Community through a Combination of Traditional Craftsmanship and State-of-the-art Technology

Jennifer Winkler

Jennifer Winkler is a 2012 graduate of Ashland University with a BFA in Fine Art and a Bachelor of Science in Art Education with minors in Spanish and art history. Her area of concentration was sculpture, with emphasis in steel fabrication and aluminum casting and minor concentration in painting. Upon graduation, she worked as a newspaper photographer and as a figure painter and muralist for Carousel Works in Mansfield, Ohio, traveling with a crew around the United States painting carousels and murals. Since the fall of 2014, she has been an art teacher at Green Local Schools in Smithville, Ohio, teaching grades 6-12.

The technical experience and background that an art educator brings to the classroom is an essential part of their art curriculum. My previous occupations from muralist to welder to photographer allow me to expand my teaching practices beyond the basics, with my students creating professional-level work from painting to ceramics, glass-blowing, metalsmithing and even computer-assisted laser-cut structures all within a public-school setting. The complex materials we use and the criteria I set create a high expectation level for my students that empowers them with a working knowledge of the subject matter and the freedom to be independent. Because of this, we are able to open up my classroom to the community and my students become the instructors of the same projects they created in class.
Quand La Culture Reste: Le Rhum et Martinique
Brianna Sargent

Student’s Majors: International Political Studies, Political Science, & French
Faculty Sponsor: Dr. Richard Gray, French

This presentation examines the culture of rum in Martinique by explaining why the island continues to produce and sell rum even though rum manufacturing locks the Martinican people into a colonial past of slavery and modern day racism. This is an issue that has seeped into the political and social culture of the island. When the islands were first colonized by the French, sugar cane was the booming crop and largest export. To keep up with demand, the islands, like most of the western hemisphere at the time, introduced chattel slavery to tend to and harvest the crops. The racism that resulted from this slavery and cash crop still permeates the culture today. This paradox will be analyzed through the French political thinkers of Tocqueville and Montesquieu. Tocqueville states that the point of departure is crucial to the lasting culture of a nation meaning that, because the island of Martinique started as a French colony with a strong, racist rum culture, it will remain that way unless direct action is taken to change the influence of the point of departure. Montesquieu states that commerce softens mores. This means that even though the people of Martinique know that racism is wrong, they are willing to allow it because they continue to make money off of the rum industry. These two concepts meld together to create the current rum culture of Martinique that ties it to its colonial past.
Evaluating Theoretical Models
Unpredictability in Field Lead Service Line Scales

Jennifer Tully

Jennifer Tully is a geologist with Pegasus Technical Services Inc. in Cincinnati, Ohio. She aids in the USEPA Office of Research and Development’s (ORD) examination of drinking water pipe corrosion scales and deposits, along with developing sampling plans to investigate the occurrence of lead in drinking water. Jennifer graduated from Ashland University in 2011 with a Bachelor of Science degree in both geology and integrated science education with a minor in biology. She also holds a Masters of Science degree in geology from Miami University (2013).

The conventional wisdom of lead-scale solubility has been established over the years by geochemical solubility models, experimental studies, and field sampling using multiple protocols. Since the publication of the US Environmental Protection Agency’s lead and copper rule (1991) public water systems have been required to monitor and control for lead corrosion within their distribution systems. Lead solubility modeling and resulting research has been extensively applied in water treatment guidance documents generally used by public water systems. However, rarely have the mineral phases from scales formed in real-world drinking water lead service lines (LSLs) been compared back to those theoretical predictions. As drinking water distribution systems can be complex and contain many variables not accounted for within the models, a disconnect often arises between the predicted and reality. In this study model predictions were compared with actual LSL scales from a variety of Midwestern systems. When possible, this data was coupled with water lead levels to estimate the efficacy of those scales in reducing lead levels. The results showed that only nine of the 22 systems studied had LSL scales that followed model predictions. The remaining systems had unpredictable scales, some with unknown lead release characteristics demonstrating that predicting scale formation and lead release solely by models cannot be relied on in all cases to protect human health.
Oral Session II
10:30-11:30 a.m.
Trustees Room
A Meditation on the Flesh: Self-Therapy for Managing Chronic Health Conditions

Kiana Ziegler

Student’s Majors: Fine Arts & Commercial Art
Faculty Sponsor: Prof. Keith Dull, Art

I have been diagnosed with chronic health conditions that impact my everyday life. In order to help deal with my thoughts and emotions relating to these chronic health conditions, I paint. My work is a cathartic self-therapy and a meditation on the flesh. Through it, I express the fear and anxiety I experience in relation to my own body and health. The most difficult part about dealing with my health conditions is the idea that I may not be able to bear my own children, an idea that has always been a major part of the future I have imagined for myself. I grieve for this lost future and come to an acceptance of what may lie ahead in the yoni forms on the canvas. Though this work is highly personal, I also wanted the viewer to be able to connect to it, so I created images abstract enough to allow the viewer to take the image wherever they would like. I also want people outside of the female gender to be able to relate to the images in some way despite the feminine nature of the issue explored and the form presented. This is why I did not depict female genitalia directly and used forms that were more complex. The complex forms and textures invite the viewer to look closely at the paintings, encouraging them to move along the curves and bumps of the works, contemplating the wonders and horrors that exist within the body.
The Psychological Science Accelerator: A Distributed Laboratory Network

Nicholas Bloxsom

Student's Majors: Psychology & Criminal Justice
Faculty Sponsor: Dr. Christopher R. Chartier, Psychology

The field of psychology is facing a replication crisis. Many published psychological studies have failed to be successfully replicated (Open Science Collaboration, 2015). In order to improve the replicability and generalizability of psychology, the Psychological Science Accelerator (PSA) was founded at AU. The PSA originated from a blog post calling for a “CERN for psychological science”. The post piqued the interest of many psychologists, and a group of psychologists has teamed up to form what is now the largest research consortium in the social sciences. The PSA is governed by a collection of committees, run by PSA members, which oversee aspects such as study selection, policy making, and results dissemination. Currently, the PSA includes over 380 psychology labs around the world in over 50 countries. Upon study selection, each network lab decides whether or not they want to participate in collecting data to contribute to each large-scale project. Here at AU, students help coordinate all PSA research activities and communicate directly with psychologists all around the world. For example, we help to onboard new labs to the PSA, record data collection demonstration videos to ensure protocols are consistent across all labs, and facilitate translation of experimental materials. Additionally, we collect data for all of the approved studies, thereby contributing to the improvement of psychological science one participant at a time. In this presentation, I will explain the basic policies and procedures of the PSA, particularly highlighting the activities of AU undergraduates.
Mexican director and producer Patricia Riggen released the film *La misma luna / Under the Same Moon* in 2007 with the intention of adding a new perspective on the debate on Mexican immigration into the United States. It immediately became a new Mexican-American classic film in part because of its star-studded cast - actors Kate de Castillo, Adrián Alonso, and Eugenio Derbez interpret the roles of the main three protagonists. Additionally, the film stays true to the spirit of the millions of Mexicans living in the United States, portraying them in a human and positive light while exploring the pain and suffering that they endure due to immigration. Although the film is fictional, the director has stated that it reflects the true experiences of millions of families. My presentation explores the cultural elements throughout the film that contribute to a new perspective on the immigration debate. These cultural elements include the life in both countries, the family, and the languages. While the film was released in 2007, its themes are even more relevant today in our present political climate in 2019. My presentation will be delivered in Spanish, with a handout given to the audience in English.
The Differing Quality of Two Wetland Plant Communities and the Possible Impact on Threatened Marsh Birds

Emily Nicholls

Student’s Major: Biology
Faculty Sponsors: Dr. Patricia Saunders, Dr. Dolly Crawford, & Prof. Merrill Tawse, Biology

This study observes differences in the quality of two marshes’ plant communities at the Black Fork Wetlands Preserve to monitor potential changes due to invasive reed canary grass (RCG). Two threatened bird species (Virginia and sora rails) have been repeatedly observed at a native plant marsh but only for one short period at a RCG-dominated marsh. If this is due to differing plant communities present, understanding the communities at each site may highlight preferred rail habitats. It is expected that the RCG marsh will have less diversity due to excessive dominance and be of lower quality than the native marsh. Transects at both marshes were subsampled for species abundance. The quality of individual species and plant communities was evaluated using plant rankings in the Floristic Quality Assessment Index. Biomass data was collected for native burr-reed, narrowleaf cattail, and bottlebrush sedge along with invasive RCG. Aerial photographs were collected to supplement manual sampling via GIS techniques. Both marshes fluctuated in the amounts and types of vegetation present across the marshes but the RCG marsh had less species richness overall. RCG accounted for over 90% of the plants sampled in most sections at its marsh while burr-reed at the native marsh was between 20-70%. The burr-reed had uneven distribution across the native plant marsh while the RCG at the boardwalk had a steady presence until abruptly dropping near the water. These and other differences may highlight how invasive plants change wetlands and affect the ability for native species to thrive.
Oral Session III
10:30-11:30 a.m.
Faculty Room
Probing the Root Exudation of Harmala Alkaloids from Syrian Rue
Corianna Borton

Student’s Majors: Forensic Chemistry & Forensic Biology
Faculty Sponsor: Dr. Brian K. Mohney, Chemistry

Syrian rue (*Peganum harmala*), native to the Middle East and southern Asia, has a history of use in rituals and folk medicine. It was introduced into the U.S. in the 1930’s and has become invasive in deserts of the southwest. Syrian rue produces six harmala alkaloids that inhibit growth of neighboring plants and negatively impact organisms living near its roots. To better understand the toxicity of these compounds in soil, alkaloids were measured using silicone tube microextraction - a technique that allows for repeated sampling of soil without disturbance. Silicone sequesters lipophilic organic compounds, such as the harmala alkaloids. Compounds are extracted from the silicone and concentrations are measured using high performance liquid chromatography (HPLC). Harmane and harmaline are detected by fluorescence detection at 10 and 1 ng/mL, respectively. The spatial and temporal profiles of the release of harmala alkaloids in the rhizosphere were measured using various planting methods and silicone probe designs. Probes show the spatial profile of harmine ranging from 11-46 ng released in soil. Soil concentrations have been correlated with toxicity of the alkaloids to dicot species. Germination and growth studies have shown that harmaline is more inhibitory than harmine. Amaranth root growth decreased by 41% for 5 μg/mL harmaline and was not affected for 5 μg/mL harmine. Changes were not seen until higher concentrations of harmine: at 100 μg/mL harmine root growth decreased by 53%. Understanding the dynamics and toxicity of alkaloid release will provide insight into the mechanism for the invasive success of Syrian rue.
Defining What is Natural: Gender Issues of Dominance and Control Within Zora Neale Hurston’s Their Eyes Were Watching God

Shelby Aulger

Student’s Major: Integrated Language Arts
Faculty Sponsor: Dr. Sharleen Mondal, English

Zora Neale Hurston’s 1937 novel Their Eyes Were Watching God marks, for many scholars, the end of the Harlem Renaissance. Arriving just seventeen years after suffrage for women was granted by the Nineteenth Amendment, her work directly confronts gender issues of her time. Prior literary consideration has often focused on the novel’s significant exploration of race and gender in terms of infidelity and individuality. This study expands upon that work by analyzing how Hurston confronts patriarchal power structures through her vast symbolism and colorful metaphorical language. The presentation will examine the use of mules, pear trees, and checkers to highlight the status of women in the 1930’s—including stereotypes, domestic roles, and sexuality—as well as the violence and dominance of men. Hurston also often hints at the idea that what is deemed “natural” is in fact, far from what she supposed it to be. This presentation also addresses Hurston’s skillful use of contrast, comparisons to the natural world, and connections to the distribution of power in social conventions and under patriarchy to discuss the idea that what society deems to be natural is often determined by those in power. That determination, as Hurston reveals, was used to mar the natural world as she perceived its original state to be.
The Relationship between Flow and Self-Efficacy
Kaylei Ruffing

Student’s Major: Psychology
Faculty Sponsor: Dr. Diane Bonfiglio, Psychology

Flow is a positive psychological state that produces a sense of optimal performance (Csikszentmihalyi, 1990). Flow tends to happen when a person’s skills are fully engaged in conquering a challenge that is in their scaffolding zone, which forces them to increase their abilities to learn new skills and pursue new goals. Because of flow’s relationship to skill acquisition and goal attainment, we hypothesized that flow would be related to sport-related self-efficacy, or belief in their ability to succeed, in athletes. Participants who self-identified as athletes were randomly assigned to one of three conditions: flow, non-flow, and neutral. In the flow condition, they were prompted to write about a time when they experienced flow; in the non-flow condition, they were prompted to write about a time when things in their sport did not go well; and in the neutral condition, they were prompted to write about the contents of a typical sport practice. Participants then completed a self-efficacy scale and a demographics questionnaire that included questions about sports participation. We expected that participants in the flow condition would report greater sport-related self-efficacy than participants in the non-flow or neutral conditions, but our results did not reveal a statistically significant difference among the groups, F(2, 67) = 1.62, p = 0.21. In further studies, we plan to examine other potential associates of flow and sport-related self-efficacy, such as hours per week spent engaging in sports, with the aim of better understanding the experience of flow in athletes.
Joshua Lawrence Chamberlain (1828-1914) was a Union brigadier general in the American Civil War. He is most known for defending Little Round Top at Gettysburg when he was a colonel, thus preventing the Confederate Army from flanking the Union line. During and after the war, Chamberlain wrote many reflections about the nature of that war, the men who fought it, and America herself. The aim of this project is to understand Chamberlain’s Civil War experience through his own words. The center of this experience was what Chamberlain labeled the “call to noble action.” By understanding the call to noble action, one can better understand the experiences Chamberlain and his men had during the Civil War. Chamberlain believed his men heard this call during the Battle of Little Round Top when they were instructed to hold their position at all costs. In this project, I will analyze Chamberlain’s definition of this call to noble action and the context required for it to sound. Chamberlain also believed that only some men could hear the call to noble action; in the second part of this project, I will explore the kind of character required to hear the call to noble action and its context. I will also discuss whether the call to noble action and the character required to hear it apply today, or are specific to the American Civil War.
Poster/Exhibit Session I
11:45-12:45 p.m.
Alumni Room
Media’s Influence on Islamophobia
Dana Awlia

Student’s Major: Psychology
Faculty Sponsor: Dr. Christopher R. Chartier, Psychology

The purpose of this experiment was to study whether people are more likely to have negative judgements of Islam and Muslims after reading about a Muslim terrorist compared to reading about a Christian terrorist. I randomly assigned 75 participants to either a “Muslim terrorist condition” in which they read a news article about a terrorist attack perpetrated by a terrorist who was described as a “devoted Muslim,” or a “Christian terrorist condition” in which they read a news article about a terrorist attack perpetrated by a terrorist who was described as a “devoted Christian.” Participants then completed the 16-item Islamophobia Scale (Lee, Gibbons, Thompson, & Timani, 2009) and a demographic questionnaire. I examined the difference in participants’ judgements about Islam and Muslims between the Muslim terrorist condition and the Christian terrorist condition by conducting an independent samples t-test, which revealed no significant difference between the Muslim terrorist (M = 4.06, SD = 0.86) and the Christian terrorist (M = 4.27, SD = 0.70) conditions, t(62) = -1.073, p = .287. Additionally, there was no significant difference in Islamophobia scores between participants who have friends from different religious backgrounds (M = 4.2, SD = 0.75) and those who do not (M = 3.8, SD = 0.87), F(1,62) = 1.9, p = .165. There was also no significant difference between participants who had knowledge about Islam through a college course (M = 4.3, SD = 0.92) and those who did not (M = 4.1, SD = 0.76), F(1,62) = .5, p = .482.
Determining the effects of water hardness on the toxicity of sodium chloride using the aquatic amphipod *Hyalella azteca*

Lauren Bood

Student’s Major: Toxicology
Faculty Sponsor: Dr. Andrew Trimble, Biology/Toxicology

Sodium chloride (NaCl) is commonly used as a deicing agent throughout Ohio and the midwestern United States. The Ohio Department of Transportation estimates that 300,000-900,000 tons of salt are applied to Ohio roads annually. Runoff from neighborhoods, highways, and other sources could discharge high levels of NaCl into surface waters. A 2010 study by the U.S Geological Survey reported stream chloride concentrations as high as 11,200 mg/L in winter runoff. The Environmental Protection Agency (EPA) threshold for aquatic life is 860 mg/L. Water hardness is defined as the amount of dissolved calcium and magnesium ions in water. Some invertebrates, like the aquatic amphipod *Hyalella azteca*, have been shown to have higher tolerance to dissolved toxicants in hard versus soft water. The objective of the present study was to examine the effects of water hardness on the toxicity of NaCl using the EPA model organism, *H. azteca*. Specifically, 96-h water-only toxicity tests were conducted using *H. azteca* exposed to NaCl at five water hardness levels as defined by the EPA. Results show that *H. azteca* have increased tolerance to NaCl with increasing water hardness. The NaCl median lethal concentrations (LC50s) were 924, 2659, 4107, 5448 and 7137 mg/L for very soft, soft, moderately hard, hard and very hard exposures, respectively. NaCl was significantly more toxic in very soft water compared to moderately hard, hard, and very hard water based on non-overlapping 95% confidence intervals. These results will help water quality managers more accurately predict risk to aquatic organisms from runoff containing NaCl.
Investigation of Metal-Organic Frameworks Incorporating Carboxycoumarin Linkers
Taylor Bunce

Student’s Major: Chemistry
Faculty Sponsor: Dr. Steven Boyer, Chemistry

An important area of cancer research is developing effective drug delivery systems that can stabilize and direct drugs to tumors to maximize treatment and reduce side effects. There are a wide range of drug delivery systems that are being explored in the literature such as organic polymers and inorganic nanoparticles. Polymers are generally much more biocompatible than nanoparticles, but lack the drug loading capacity of nanoparticles. Metal-organic frameworks (MOFs) are another class of materials being studied as potential drug delivery systems. MOFs are materials that connect metal nodes with an organic linker which can potentially form extended, porous structures. The porous structures offer a large surface area for molecules, including drugs, to be stored and undergo controlled release. Once the molecule has been released, MOFs are known to decompose over time in the presence of water making it important to use biocompatible metals and linkers. We have explored the use of carboxycoumarins, molecules that have antibacterial and anti-tumor properties, as potential organic linkers in MOFs. Upon degradation of the MOF, a biocompatible metal such as iron and zinc will be released in addition to a drug. We have begun the synthesis of carboxycoumarin derivatives to be used as organic linkers and the corresponding MOF with iron or zinc as the metal node. Because single crystals of the MOF are required for characterization, several reaction conditions have been explored to grow a crystalline MOF for analysis.
Method Development for the Analysis of E-Cigarette Liquids and Aerosols

Ryan Curtis

Student’s Major: Forensic Chemistry
Faculty Sponsors: Dr. Rebecca Corbin, Chemistry & Dr. Dolly Crawford, Biology

Electronic Cigarettes (E-cigs) were originally marketed as desirable alternatives to traditional tobacco cigarettes and are often portrayed as a quit-smoking aid. Unfortunately, E-cigs have become a popular fad with teenagers, and the health effects of these widely available vaping devices are largely unknown. E-cigs typically contain propylene glycol, glycerin, water, flavorings, and the addictive stimulant nicotine. The aim of this study is to develop methods to investigate the composition of vaping liquids as well as the aerosols produced in individual vaping devices, in addition to E-cig aerosols pumped into an air-tight whole-body exposure chamber. This project began with the evaluation of two instrumental methods: high-performance liquid chromatography (HPLC) and gas chromatography mass spectrometry (GCMS). The nicotine content in standard solutions as well as extracts from traditional cigarettes and vaping liquids was measured successfully with HPLC. GCMS analysis of vanilla, blueberry, unflavored, and tobacco-flavored vape juices revealed informative chromatograms. Propylene glycol and glycerin were detected in each flavor. The blueberry and vanilla showed peaks corresponding to specific flavoring additives. Nicotine was readily detected in the vanilla, blueberry, and tobacco varieties, but not in the unflavored vaping liquid. The development of methods to accurately sample and analyze aerosols collected from the whole-body exposure chamber is currently underway. Preliminary work has used silicone tube microextraction in combination with GCMS. Once optimized, these methods should enable the monitoring of E-cig components throughout the vaping process. A long-term goal of this interdisciplinary research collaboration is to explore the toxicity of E-cig aerosols on living systems using the whole-body exposure chamber.
Investigation of Imaging Agents and Targeting Moieties in Phosphazene Drug Delivery Systems

Dominique Drake & Shelby Reutter

Students’ Majors: Forensic Chemistry (DD); Biology, Toxicology & Environmental Science (SR)
Faculty Sponsor: Dr. Nicholas A. Johnson, Chemistry

In recent years, the development of new pharmaceuticals has garnered much interest and despite the major advances in the field, one of the main challenges remains drug delivery. Many drugs that display high activity are lipophilic (fat-soluble); however, in order to deliver these molecules, they must also be hydrophilic (water-soluble). One way to increase the aqueous solubility of pharmaceuticals is through using cyclic chlorophosphazenes as a drug delivery system. Cyclophosphazenes are a model system for this delivery for several reasons, one being the ease at which the phosphorus atoms of the ring structure can be substituted with a wide variety of side groups. We have synthesized a hydrophilic phosphazene-based system by substituting three equivalents of tetraethyleneglycol monomethyl ether (TEGME) onto the phosphazene trimer ring ([PCl₂N]₃). The final product of the above synthesis contains three additional sites for further modification and substitution. We are currently investigating the efficacy of substituting imaging agents (coumarins) and targeting moieties (triphenylphosphonium cations) to the previously synthesized phosphazene system. Triphenylphosphonium-based compounds have demonstrated effectiveness in targeting mitochondria in cancer cells. By attaching triphenylphosphonium cations to the cyclophosphazene system, the efficacy of the compound may increase while also decreasing toxicity. Coumarins have been widely used in the fields of chemistry, biology, and medicine. Incorporation of coumarins into the phosphazene drug delivery system will afford the ability to track the progress of the drug throughout the body.
Determining the Relationship between Happiness and Mental Toughness

Mallorie Harding

Student’s Major: Biology
Faculty Sponsors: Dr. Curt Ickes & Prof. Peter Mallik, Psychology

Being able to overcome setbacks, cope with poor performance, and use positive responses in unfavorable situations is defined as mental toughness. Mental toughness has been positively correlated with athletic achievement in numerous studies (Cowden, 2016; Crust, 2007; Nicholls, Polman, Levy, & Backhouse, 2009). A positive relationship between mental toughness and psychological wellbeing has also been suggested (Stamp, E., Crust, L., Swann, C., Perry, J., Clough, P., & Marchant, D. (2015). The purpose of the current study is to examine whether a similar relationship exists between mental toughness, as measured by the Mental Toughness Index (Gucciardi, Hanton, Gordone, Mallett, & Tembry, 2015) and subjective happiness, as measured by the Subjective Happiness Scale (Lyubomirsky & Lepper, 1999). The 207 participants were recruited, and participated, through Amazon’s Mechanical Turk (MTurk) online platform. Once agreeing to participate, they were provided a link to all of the above surveys via the SurveyMonkey website. From our sample of 207 individuals, the average mental toughness score was 43.23 (SD=7.73) and the average happiness score was 17.69 (SD=3.95). There was a significant correlation between happiness and mental toughness \( r(206)=0.478 \). Results from the correlations and a subsequent linear regression indicate that mental toughness is a significant predictor of happiness which can account for 22.8% of the variance \( F(1,205)=60.688 \ p<0.001 \). Taking this information into account, one can predict overall happiness by assessing mental toughness, however, since mental toughness does not account for 100% of happiness, it cannot be completely predicted.
Water Quality Monitoring in the Black Fork River, a Tributary in the Ohio River Basin

Maria Kern

Student’s Majors: Forensic Biology & Toxicology
Faculty Sponsor: Dr. Jenna Dolhi Binder, Biology

Due to intensive agriculture in the surrounding areas, the Black Fork River is subject to nutrient pollution caused by fertilizer runoff. In response, a long-term water quality monitoring program in the Black Fork River began in July 2017. Project goals are to characterize the effects of land use on water quality and to monitor quality of the Black Fork River. The latter goal will both establish a baseline data set that could be used to evaluate land management practices or other watershed improvements and serve as a basis to determine if future improvement efforts are effective. Monitoring nutrients present in water samples could allow for development of concrete conclusions about the relationship between land use and water quality. The baseline data provided will also benefit future research. Nitrate and phosphorus nutrients are measured spectrophotometrically (Hach company kits). Additional physical and chemical parameters, including temperature, dissolved oxygen (mg/L), total dissolved solids (g/L), salinity (ppt), pH, and conductivity (mS/cm), are measured at sample sites using a YSI multiprobe. To date, an inverse relationship between dissolved oxygen and temperature has been found, with the possible exception of low precipitation months. Nitrate and phosphorus concentrations were found to be independent of each other, and while trends varied between years, a peak in both nutrient concentrations occurred in May 2018. This monitoring program fills an important gap, as this recreationally important watershed is not regularly monitored. Further, this program contributes to the overall picture of water quality in the Ohio River watershed and downstream systems.
Price Estimations and Confidence Levels: An Experiment Replicated
Bryce McClish & Elizabeth Takacs

Students’ Major: Psychology
Faculty Sponsor: Dr. Christopher R. Chartier, Psychology

This experiment was a replication of De Neys et al. (2013), which studied the difference in accuracy and confidence of participants when completing a potentially tricky math task compared to a straightforward math task. In the original study, the straightforward task was usually answered correctly, and participants reported more confidence than in the potentially tricky task. This pattern of results showed when participants were incorrect due to subjective judgement, they were aware of it, and uncontent with wrong answers. In the replication, the first question was, “a pencil and eraser cost $1.10, and the pencil costs $1 more than the eraser. How much does the eraser cost?” The “more than” was tricky wording intended to confuse participants in a simplistic math task. The second version of the question omitted “more than” but asked “how much would a banana cost if the total was $2.90 and the magazine costs only $2.00.” We successfully replicated both results. Participants were far less accurate in the “more than” wording condition (16.0%) than in the “cost only” wording condition (97.8%), \( \chi^2 (N = 232) = 164.29, p < .001 \). Participants were less confident in the “more than” wording condition (\( M = 89.7, SD = 22.2 \)) than they were in the “cost only” wording condition, (\( M = 95.1, SD = 16.7 \)), \( t(115) = 3.8, p < .001 \). The experiment by De Neys et al. (2013), was successfully replicated [in both aspects] and results showed that humans are not confident when being subconsciously tricked.
An Examination of News Coverage and Media Framing of Gay Marriage/Marriage Equality
Kaitlyn Moore

Student’s Major: Digital Media Journalism
Faculty Sponsor: Prof. Maggie Cogar, Journalism

In this summative qualitative content analysis, the researcher aims to study framing in journalism as it relates to the news coverage of gay marriage/marriage equality. The author will analyze 150 news articles in the year before, during, and after the June 26, 2015 Obergefell v. Hodge Supreme Court decision which nationally legalized gay marriage by looking at story word choice, image selection, and frequency of coverage. Our consumption of news media affects how information is perceived about the world around us and thus helps shape social constructs. Since the news media plays this vital role in shaping public opinion and the public’s understanding of politics and policies, understanding how the media intentionally and unintentionally frames those issues is important in the larger understanding of media effects. These concepts are the foundation of this interpretive content analysis and should help shed light on how the media framed the issue of gay marriage/marriage equality.
The Relationship Between Internal Body Temperature and Interactive Behavior in Domesticated Felines
Scarlet Snow

Student’s Major: Biology
Faculty Sponsor: Dr. Dolly Crawford, Biology

The long association between humans and domesticated felines has greatly enhanced our knowledge of feline physiology. However, little is known about the interaction between long and short haired cats and their physiology and behavior. In this study, I tested the null hypothesis that there is no relationship between cat hair length, behavior and body temperature. Behavioral, phenotypic and body temperature data were collected from 34 individual cats housed at a local animal sanctuary. A GoPro video camera was used to record 1.5 hours of video. Behavioral data on sleeping, social interaction and vocalization were collected from each video. A FLIR C2 infrared thermographic camera was used to assess temperature readings from the head, body, nose, ears, front limbs, and hind limbs of each animal. Preliminary data analyses were conducted using the R v.3.5.3 statistical environment. Temperature variables were tested for correlation using Pearson’s r correlation test and correlated variables were removed from subsequent analyses. Results demonstrated that long-haired and short-haired cats differ significantly in several behaviors and in body temperature. Short-haired cats tend to radiate more heat from the head \( F(1,12)=3.57, p=0.045 \), are more likely to socialize with other cats \( F(1,21)=9.21, p=0.007 \) and be more vocal \( F(1,26)= 5.13, p=0.032 \) compared to long-haired cats. Overall, results of the preliminary analyses suggest a direct association between cat phenotype, body temperature and behavior. This information can help to further our understanding of feline physiology, and also enhance the care of these animals in captive settings.
Bateman Case Study 2018 Competition: Ashland Has a Heart of Gold
Erin Staley

Student’s Majors: Public Relations & Strategic Communication, Health & Risk Communication
Faculty Sponsor: Prof. Shawn Orr, Communication Studies

The Bateman Case Study Competition is the Public Relations Student Society of America’s national case study competition that provides college students with the opportunity to create and implement a public relations campaign. For 2018, the nonprofit organization, With Purpose, was selected. With Purpose’s goal is to create a world in which kids with cancer have access to safe and effective treatment options. With Purpose wanted teams to create a campaign to support their mission. For this competition our team created The Heart of Gold Campaign which utilized the four steps of the public relations process including conducting research, planning and implementing the campaign, and evaluating the results. The first objective of our campaign was to raise awareness about With Purpose and childhood cancer research through face-to-face communication with at least 150 audience members. To achieve this, we used the strategy of a tabling event stationed in high-traffic locations on campus. Those who stopped at the table had the opportunity to engage with our team in a conversation to learn more about With Purpose. Our second objective was to obtain 300 signatures on a petition, asking the National Cancer Institute to designate a larger percentage of its funds to childhood cancer research. To achieve this we used the strategy of classroom visits to engage with students about With Purpose. We exceeded both objectives by reaching 364 students, faculty, and staff members through face-to-face communication and collected 302 target signatures on our petition.
Utilizing Cyclophosphazenes and Imidazolium Salts as Potential Anti-cancer Agents

Evan Thomae

Student’s Majors: Biochemistry & Psychology
Faculty Sponsor: Dr. Nicholas A. Johnson, Chemistry

The use of imidazolium salts and their derivatives as potential anti-cancer molecules is gaining attention in the medical field. A common limitation of imidazolium salts (and many pharmaceuticals) is the loss of water solubility (hydrophilicity) with increased anti-cancer activity. This loss of solubility results in a decrease in the potential administration; however, these effects can be counteracted by attaching the imidazolium salt to a molecule with high hydrophilicity. Utilizing an inorganic system, mainly phosphazenes, as a drug delivery system can improve the hydrophilicity of the drug molecule. Phosphazenes are easily modifiable and possess great qualities that make them viable candidates for drug delivery systems. Although numerous biomedical applications that involve phosphazenes have been produced, the vast majority have utilized polyphosphazenes. Our research focuses on the use of cyclophosphazenes, which are oligomeric phosphazene rings. Cyclophosphazenes have many similar attributes to polyphosphazenes such as a biodegradable phosphorous-nitrogen structure, ease of substitution, and can be substituted with a wide variety of side groups; however, cyclophosphazenes are much easier to synthesize and are inexpensive synthetic targets. We have synthesized a hydrophilic cyclophosphazene by substituting three equivalents of tetraethyleneglycol monomethyl ether, a polyethylene glycol derivative. By substituting these groups onto the cyclophosphazenes, it creates a water-soluble delivery system that can still be further substituted with imidazolium salts that are highly active anti-cancer agents. Adding imidazolium salts to the cyclophosphazene core creates an amphiphilic system (both water and fat soluble) that can be delivered systemically throughout the body.
Brand Identity and Product Packaging Design
Cait Davis, Sage Haines, Allison Montgomery, Michaela Ping, Madeline Rogowski, Robby Young, & Kiana Ziegler

Students’ Majors: Commercial Art (CD, SH, AM, MP, MR, RY, KZ), Digital Media Production (SH, MP), Fine Arts (KZ), Marketing (MR, RY)
Faculty Sponsor: Prof. Michael Bird, Art

Professional graphic designers are often tasked with branding a company. Branding, as a marketing term, refers to the method of presenting a distinctive identity through consistent design and messaging. In the final course for graphic design majors, students are tasked to create advertisements and packaging designs for products for a brand of our own creation. As this year’s graphic design seniors, we worked to complete the project to showcase in our Senior Exhibition. Though we each worked independently on our own projects, we were all guided by the same criteria and completed the same base projects. First, we researched other brands that create products similar to the ones we wanted to create. Having a base knowledge of the aesthetics and demographics of successful brands helped guide us in making our own decisions. Then we created our company logos and graphics. Our logos had to be versatile, so that we could use them on various package types and stationary. After choosing our brand colors, we made business cards, stationary, advertisements, along with packaging designs for our companies. Finally, we constructed displays to showcase our products. Examples of the products we created are Robby Young’s clothing line, Allison Montgomery’s skin care line, and Sage Haine’s chocolates. Our goal was to create a consistent visual identity for the company, engage those of our target demographic, and entice those consumers to buy our products.
In My Blood
Victoria Roddy

Student’s Major: Fine Arts
Faculty Sponsor: Prof. Keith Dull, Art

In My Blood is a painting series in which I started to acknowledge my difficult childhood. Growing up, I struggled to handle my mental illness brought on by trauma and used negative coping skills to get by. One of those skills was Maladaptive Daydreaming (MD), a psychiatric condition where a person dissociates by daydreaming addictively. In My Blood is about openly acknowledging childhood issues that I neglected to deal with by dissociating using MD. My work is inspired by surrealism and the concept of Alice in Wonderland because they both explore the subconscious and the idea of a dream world. I integrate symbolism into my work because it is about emotions and mental states, concepts that do not have a physical form. A recurring theme is the Death-Head Hawkmoth, the symbol for MD in my series, because of the dual imagery it presents. While drawing viewers in with its beauty they must remember to watch out for the skull on its back, the symbol of death. In creating this series to openly acknowledge my childhood I am also letting it go. Painting about these issues is very therapeutic for me and I find that as I am working on these paintings I am also working through the difficulties that have hindered me in the past.
Poster/Exhibit Session II
12:45-1:45 p.m.
Alumni Room
Mental toughness can be seen as a person’s ability to overcome difficult or unpleasant problems in a generally positive manner, overcoming setbacks and obstacles that might stand in their way of personal success. Mental toughness has been found to be positively correlated with athletic achievement in numerous studies (Cowden, 2016; Crust, 2007; Nicholls, Polman, Levy, & Backhouse, 2009). The purpose of the current study is to examine whether a similar relationship exists between mental toughness, as measured by the Mental Toughness Index (Gucciardi, Hanton, Gordone, Mallett, & Tembry, 2015) and academic performance, as measured by the grade point average (GPA). A total of 144 college students completed the Mental Toughness Index, and also provided both high school and college grade point averages. Our sample had an average High School GPA of 3.46 (SD=0.44), an average College GPA of 3.24 (SD=0.47), and an average mental toughness score of 44.32 (SD=5.69). The results indicate a positive correlation between Mental Toughness and High School GPA ($r(142) = 0.20$, $p<.05$). The correlational data and a subsequent linear regression indicate that 3.9% of variance in High School GPA can be accounted for by Mental Toughness, with $F (1,142) = 5.792$, $p = 0.017$, and $r^2 = .039$. However, there was not a significant correlation between Mental Toughness Index scores and College GPA, ($r(142)=.16$, $p=.059$). This study’s findings indicate that mental toughness is related to high school academic performance, as measured by grade point average.
The Effects of PTU Treatment on Zebrafish Embryo Development

Brianna Brdicka

Student’s Major: Toxicology
Faculty Sponsor: Dr. Mason Posner, Biology

Phenylthiourea (PTU) is a compound commonly used in zebrafish research to block melanin production in embryos during development, rendering them transparent. This transparency allows for observation of their development as they grow. Published studies have found that dosing at 0.2 mM, the typical PTU dose concentration, and higher concentrations results in reduced eye size and impaired thyroid function. To determine if the typical dose concentration of PTU alters gene expression, two genes were selected: *id3*, which is expressed in the eye tissue, and *tpo*, which codes for the production of thyroid peroxidase. We dosed twelve zebrafish embryos for four days post fertilization (dpf) in each of the different concentrations of PTU: 0.15 mM, 0.3 mM, 0.6 mM, as well as a water control. Forty-eight embryos received daily PTU dose changes (changed), while another 48 embryos remained in the same PTU dose (unchanged). We used quantitative RT-PCR (qRT PCR) to measure gene expression levels of *id3*, *tpo*, and the reference gene ef1. One replicate of dosing has been completed, and we found that there was statistically significantly delayed hatching in the 0.6 mM PTU changed and unchanged embryos and 0.3 mM changed embryos compared to control embryos with no PTU exposure (Yates Corrected X2 Test; p value < 0.001). Two more replicates of dosing will be completed, and the gene expression levels between the different concentrations will be statistically compared. Our results suggest that zebrafish researchers utilizing PTU treatments should consider the chemical’s possible effects on embryo physiology.
Exploring the Relationship between Mental Toughness and Social Support
Katherine Conley

Student’s Major: Psychology
Faculty Sponsors: Dr. Curt Ickes & Prof. Peter Mallik, Psychology

Mental toughness is often defined as a set of positive attributes that allows someone to cope effectively with failure and challenges. These attributes include such things as resilience, confidence, effective emotional control, and commitment. Mental toughness has been positively correlated with such things as athletic achievement (Cowden, 2016; Crust, 2007; Nicholls, Polman, Levy, & Backhouse, 2009), psychological wellbeing (Stamp, Crust, Swann, Perry, Clough, & Marchant (2015), and physical activity (Gerber, Kalak, Lemola, Clough, et. al., 2012). The purpose of the current study is to examine whether a similar relationship exists between mental toughness, as measured by the Mental Toughness Index (Gucciardi, Hanton, Gordone, Mallett, & Tembry, 2015) and one’s perceived level of social support as measured by the Duke-UNC Functional Social Support Questionnaire (Broadhead, Gehlbach, de Gruy, & Kaplan, 1988). I recruited 107 undergraduate participants to complete both surveys. The average Mental Toughness score was 42.99 (SD=6.36) and the average Social Support score was 53.73 (SD=9.64). Correlational data indicates a significant positive relationship between Social Support and Mental Toughness $r(107)=0.491 \ p<0.001$. A subsequent linear regression indicates that 24.2% of the variance in Mental Toughness can be accounted for by Social Support $F(1,105)=33.435 \ p<0.001$. This indicates that one can predict meaningful variance in Mental Toughness by having information about one’s Social Support.
Design and Construction of an E-cigarette Inhalation Chamber

Cameron Middis

Student's Majors: Physics & Mathematics
Faculty sponsor: Dr. Rodney Michael, Physics

An inhalation chamber was designed and built with the objective of creating a system that can deliver E-cigarette vapor into an airtight chamber in consistent concentrations. This will allow for a biological study concerning the effects of E-cigarettes on mice. A delivery system was built with an adjustable timer so that different levels of E-cigarette vapor concentration can be achieved while also allowing for computerization upgrades without changing the exposure chamber. The main chamber is built large enough so a separate, smaller, container housing the mice can be placed inside. The smaller container allows the mice to be exposed to the vapor while providing a clean and simple method for handing the mice. A fan inside the exposure chamber is utilized for mixing the air with the E-cigarette vapor in a uniform fashion throughout the exposure process. This has the added benefit of preventing any settling of particulates from the vapor. Additionally, a syringe access point is included on the chamber wall so samples of the air/vapor mixture can be extracted and tested for chemical composition and concentration. The development and use of this chamber is a multi-discipline research project spanning the Departments of Chemistry/Geology/Physics and the Department of Biology/Toxicology. The engineering and construction of the chamber was performed as a Physics research project. Chemistry research students are able to extract samples from the chamber for chemical analysis. The information provided by this chemical analysis will assist Biology research students in their studies of E-cigarettes on biological systems.
Using Passive Sampling as a Method for Pesticide Analysis
Cillian Donahue

Student’s Majors: Forensic Biology & Toxicology
Faculty Sponsors: Dr. Jeffrey Weidenhamer, Chemistry & Dr. Andrew Trimble, Biology/Toxicology

Trace pesticide analyses can be difficult and costly due to the extensive time required for processing, and large solvent volumes required. Therefore, a simpler method for pesticide detection using passive sampling could be of much benefit. Passive sampling is based on the idea that various chemical pollutants can be accumulated onto a collecting device and be quickly extracted with small quantities of solvent for further analysis. The objective of this study was to use probes constructed with silicone as a passive sampling device that could be inserted into wet sediments and extract the probes to detect pesticides. Pesticides of interest include those currently in use as well as legacy pesticides which are no longer used but persist in sediment. In a preliminary analysis with the legacy pesticide DDE, the chemical was spiked onto wet sand samples at concentrations of 10 parts per billion and 30 parts per billion. Silicone probes were inserted into each sample for a one-week period. Following a hexane extraction of pesticides from the probes, DDE was detected using a gas chromatograph equipped with an electron capture detected which is sensitive to halogenated compounds. In addition, there is a positive correlation between the concentration of pesticides in the sediment and the amount of pesticide extracted from the probes. These results verify that it is possible to collect pesticides on silicone tubing and extract them for further analyses. Further projects using this methodology will include looking at an array of pesticides in various sediments and analyzing real world samples from the Black Fork Wetlands.
Microplastic Quantification in the Black Fork and Clear Fork Rivers
Alexis Flagg & Emily Fulk

Students’ Majors: Forensic Biology & Toxicology (AF), Environmental Science & Biology (EF)
Faculty Sponsor: Dr. Jenna Dolhi Binder, Biology

As usage of plastic grew in the United States during the 1940s and 50s, the impact of pollution on the environment was soon recognized. Many of the plastics in the ocean can be seen, like the Great Pacific Garbage Patch, but many plastics aren’t as easily seen. A microplastic can be defined as being 5mm in diameter or less, and can be found in the form of fibers, fragments, pellets, film or foam. Our study focused on quantifying microplastics at select sites in the Black Fork River and the Clear Fork River, tributaries in the Ohio River basin that flow into the Mississippi River. Water samples from these rivers, which feed local recreational lakes (Charles Mill Lake and Pleasant Hill Lake, respectively), were obtained to quantify and classify microplastics using a dissection microscope. Further we sampled zooplankton to determine if they are consuming these plastics in the wild. We hypothesized that there would be more plastics found downstream of recreational reservoirs than upstream, due to the human impact on the lakes. We found that the Black Fork River contained more microplastics within its waterway than the Clear Fork River. Additionally, there were more microplastics upstream of the lakes than downstream. Fibers were the most abundant microplastic type found.
Identification of Novel Transcription Factor Genes Involved in Lens Development Using Genome Editing

Emmaline Kepp

Student's Major: Biology
Faculty Sponsor: Dr. Mason Posner, Biology

Cataracts, the leading cause of blindness worldwide, form when proteins aggregate in the lens. Multiple proteins are thought to prevent cataracts, however, the importance of proper lens development in connection to cataracts is relatively unstudied. The goal of our study was to investigate the role that transcription factor (TF) genes play in epithelial to fiber cell differentiation (the final step of lens development), by utilizing the gene editing technique of CRISPR/Cas9 in zebrafish. CRISPR allows us to disable the function of specific genes, while microscopy techniques allow us to observe if the loss of these genes results in cataract production in the zebrafish lens. We used published gene expression data from our collaborator Ales Cvekl to select six TF genes upregulated in lens fiber cells. The CRISPR technique was performed by microinjecting components into zebrafish embryos, and the DNA from these embryos was extracted. Polymerase chain reactions allowed us to amplify specific regions of the genes of interest in extracted DNA. Amplified samples were sequenced to determine if CRISPR had mutated the target gene. Thus far, a single confirmed mutation has been found in the gene id2a. Zebrafish with this mutation are being raised and will be bred to produce a population lacking this gene. These offspring will be viewed by microscopy to determine whether gene loss leads to cataracts. The collection and future publications of such data will help further the understanding of the causes of protein aggregation leading to cataracts, and better equip scientists to tackle the prevention of this disease.
Cochrane (2010) stated that music arouses emotion, which allows music to capture emotional experience. Can music-induced mood impact memory for emotional stimuli? My hypothesis was that participants in a happy mood would remember more positive words, and those in a sad mood would remember more negative words. Participants listened to music that induced a happy or sad mood (Mitterschiffthaler et al., 2007), while those in the neutral group (control) did the task in silence. For the mood groups, music was playing when they walked into the laboratory and was present during the entire experiment. Participants were presented with 36 total words, randomly presented for 3 seconds, with 12 from each of three mood categories. After word presentation, participants were given two minutes to recall as many words as possible. A two-way ANOVA demonstrated that there was a significant difference in the number of words recalled among the groups \( F(2,69)= 4.30, p< .01 \). Tukey tests showed that the happy group recalled fewer words than control \( (p < .01) \). There was also a significant effect of word type \( F(2,138)= 30.77, p<.001 \) in that the neutral words were recalled less often than positive or negative words \( (p<.05) \). Furthermore, there was no interaction between the two variables \( F(4,138)= .95, p>.05 \). My hypothesis was not supported in this experiment, but my results did show that emotional words were better remembered than neutral words and those in a happy mood remembered fewer words than control.
Reduced Framing Biases when Presenting Decisions in Foreign Languages

Kaylei Ruffing & Tiffany Smolinski

Students’ Majors: Psychology (KR), Psychology, Spanish & French (TS)
Faculty Sponsor: Dr. Christopher R. Chartier, Psychology

A classic psychological finding, known as the framing effect, is that people make riskier decisions when propositions are presented in terms of losses instead of gains. This effect is often measured by responses to the “Asian Disease” problem (Kahneman & Tversky, 1979), in which participants are asked a hypothetical question about using an experimental drug. Outcomes are either framed as resulting in saving lives or losing lives. Keysar, Hayakawa, and Gyu An (2012), found a reduced framing effect in a foreign language compared to one’s native language. Their study investigated Japanese, Korean, and French. We sought to replicate and extend their findings, and recruited Spanish and French students from classes at Ashland University. We distributed randomized surveys that included the “Asian Disease” problem presented in gain and loss frames in English, Spanish, and French. Overall, we found the typical framing effect when collapsing across all languages, $\chi^2(1, N = 288) = 30.295, p = <.001$. The effect was quite strong in English, $\chi^2 (1, N = 144) = 17.527, p= <.001$. In Spanish and French (combined), the effect was still present, but substantially weaker, $\chi^2(1, N =144) = 12.761, p = <.01$. These results suggest that the framing effect is not lost, but simply diminished, when one switches to a foreign language. We successfully replicated the basic pattern of results in Keysar, Hayakawa, and Gyu An (2012) and further extended their findings to a new sample and to new languages. These results have implications for how risky propositions are presented to patients.
Comparison of Toxic Metals in Feathers of Virginia and Sora Rails from the Black Fork Wetlands and Winous Point Hunting Club in Sandusky Bay

Tyler Theaker

Student’s Majors: Environmental Science & Biology
Faculty Sponsor: Prof. Merrill Tawse, Biology

The Sora and Virginia Rails are species of birds that are listed as “Species of Concern” by the Ohio Department of Natural Resources (ODNR) mostly due to habitat loss. They inhabit emergent wetland plant communities such as that of Ashland University’s Black Fork Wetlands, where they nest and forage for food. Our concern is that they may pick up lead shot or toxins from agricultural wastes accumulated in the substrate of Black Fork Wetlands as they forage. These toxins could also be leading to their decline. The presence of lead and other elemental toxins can be detected in feathers through atomic spectroscopy. In this study, we are comparing seven feather samples from AU Preserve birds to nine feather samples collected from the Winous Point Hunting Club of Lake Erie’s Sandusky Bay. Winous Point Hunting Club has been much more heavily hunted than the Black Fork Wetlands, and is probably much more affected by agricultural activities. Feathers have been shown to provide a good measure of a bird’s lead exposure. We conducted acoustic surveys to determine the presence of Rails, and where to set up Cloverleaf traps. Once the birds were caught we banded them, and tagged some with radio transmitters to determine exact movements within the wetlands. Feathers were clipped from breast, back, tail and wings. Following digestion of samples with nitric acid, samples are being analyzed by emission spectroscopy to determine whether birds at Winous Point have higher levels of lead exposure.
Impact of Suggestion and Time on Eyewitness Testimony
Jessica Wilson

Student’s Majors: Psychology & Criminal Justice
Faculty Sponsor: Dr. Mitchell Metzger, Psychology

Eyewitness memory is not always accurate, but jurors often rely on eyewitness testimony potentially leading to false convictions. Many factors have been shown to influence eyewitness memory. The goal of this study was to investigate the effect of a time delay combined with exposing participants to different types of words after witnessing an event. A video of a street mugging (in which no weapon was used), two types of word lists (one with names of weapons and one without weapon names), and a ten item questionnaire to measure memory for the mugging video were used. I hypothesized that if participants watched the video and then viewed a word list that contained the names of weapons, they would be more likely to remember seeing a weapon in the video. Additionally, I also hypothesized that a time delay would increase the influence of the weapon list. A $2 \times 2$ between subjects ANOVA indicated that there was no main effect of list type on memory recall ($F(1,55) = .025, p > .05$), nor a main effect of delay ($F(1,55) = 3.763, p = .058$). Also, the interaction (list type $\times$ delay) was not significant ($F(1,55) = .021, p > .05$). The results indicated that the manipulation of list type or delay did not impact participant’s eyewitness memory. Perhaps a longer delay between the video and memory testing would impact participant recall of event details.
A Meditation on the Flesh: Self-Therapy for Managing Chronic Health Conditions

Kiana Ziegler

Student’s Majors: Fine Arts & Commercial Art
Faculty Sponsor: Prof. Keith Dull, Art

I have been diagnosed with chronic health conditions that impact my everyday life. In order to help deal with my thoughts and emotions relating to these chronic health conditions, I paint. My work is a cathartic self-therapy and a meditation on the flesh. Through it, I express the fear and anxiety I experience in relation to my own body and health. The most difficult part about dealing with my health conditions is the idea that I may not be able to bear my own children, an idea that has always been a major part of the future I have imagined for myself. I grieve for this lost future and come to an acceptance of what may lie ahead in the yoni forms on the canvas. Though this work is highly personal, I also wanted the viewer to be able to connect to it, so I created images abstract enough to allow the viewer to take the image wherever they would like. I also want people outside of the female gender to be able to relate to the images in some way despite the feminine nature of the issue explored and the form presented. This is why I did not depict female genitalia directly and used forms that were more complex. The complex forms and textures invite the viewer to look closely at the paintings, encouraging them to move along the curves and bumps of the works, contemplating the wonders and horrors that exist within the body.
The Ideal Art Curriculum: Bridging the Gap between School and Community through a Combination of Traditional Craftsmanship and State-of-the-art Technology
Jennifer Winkler

Jennifer Winkler is a 2012 graduate of Ashland University with a BFA in Fine Art and a Bachelor of Science in Art Education with minors in Spanish and art history. Her area of concentration was sculpture, with emphasis in steel fabrication and aluminum casting and minor concentration in painting. Upon graduation, she worked as a newspaper photographer and as a figure painter and muralist for Carousel Works in Mansfield, Ohio, traveling with a crew around the United States painting carousels and murals. Since the fall of 2014, she has been an art teacher at Green Local Schools in Smithville, Ohio, teaching grades 6-12.

The technical experience and background that an art educator brings to the classroom is an essential part of their art curriculum. My previous occupations from muralist to welder to photographer allow me to expand my teaching practices beyond the basics, with my students creating professional-level work from painting to ceramics, glass-blowing, metalsmithing and even computer-assisted laser-cut structures all within a public-school setting. The complex materials we use and the criteria I set create a high expectation level for my students that empowers them with a working knowledge of the subject matter and the freedom to be independent. Because of this, we are able to open up my classroom to the community and my students become the instructors of the same projects they created in class.
Oral Session IV
2:00-3:00 p.m.
Trustees Room
Density-Dependent Growth Responses of *Arabidopsis* to Copper Toxicity

Abigail Dingus

Student’s Majors: Biology & Biochemistry
Faculty Sponsors: Dr. Jeffrey Weidenhamer, Chemistry & Dr. Soren Brauner, Biology

Plant growth responses to toxic copper concentrations are density-dependent. Copper toxicity is reduced at high plant densities for reasons that are not clear. One possible mechanism is the release of citrate from roots in response to excess copper. Citrate binds metals, and thus pooled exudates at high plant densities could reduce copper uptake. This hypothesis was tested using *Arabidopsis thaliana* cultivars that either produce (wild type) or do not produce (mutant) citrate in response to metals in soil. An ecotype native to serpentine soils (Santa Clara) was included for comparison. Cultivars were grown at four densities. Copper treatments were applied at rates of 75, 125, and 175 micrograms copper per gram of soil. Plants were harvested, dried, and biomass was measured. Plant material was analyzed for copper. For each cultivar, the amount of copper removed from the soil increased with plant density. At each density, the Santa Clara ecotype was the most efficient in copper extraction. Toxicity of copper was reduced at higher plant densities, but the role of citrate is not clear. For both mutant genotypes, the concentrations of copper per gram biomass were more than double those of wild type plants. This supports the original hypothesis. However, the greater copper uptake by the mutant varieties did not result in greater toxicity. These findings are relevant to phytoremediation of soils and to ecotoxicological testing, which typically does not take plant densities into account. More research is needed to understand the mechanism behind density-dependent effects.
The Impact of Brand Perceptions on Consumer Behavior
Audrey Saler

Student’s Majors: Marketing & Business Management
Faculty Sponsor: Dr. Rebecca Schmeller, Business Management

A company’s brand can either help lead it to success, or contribute to its failure. When a business introduces new products into the market, there are many decisions that must be made on how to brand that item. One of these decisions is whether to attach the existing brand name to the product, known as family branding, or to introduce the new product under its own brand name, known as individual branding. The study conducted included a survey of 122 participants, asking about brand loyalty towards different products, as well as the premium they would be willing to pay for their favorite brands. The survey was conducted under the hypothesis that the level of brand loyalty depends on the type of product as well as the monetary cost to the consumer for the products. This survey was also able to reveal whether or not certain products held a significant difference in the brand loyalty for males and females. An experiment testing whether or not the perceptions of a brand are extended onto new products offered under the same brand name was also conducted with 66 participants by having subjects sample different products from what they thought were different companies and asking their opinions on the products and the brands. This experiment revealed that new products can have an impact on the perception of a brand and, conversely, the brand can have an impact on the perception of the product.
The Cleveland Browns: Obstacles to Creating a Culture of Excellence

Andrew L. Spies

Student's Major: Business Administration
Faculty Sponsor: Dr. Jeffrey Sikkenga, Political Science

This project aims to understand how great organizations cultivate excellence within themselves. To understand the question a professional sports organization was studied that had a championship culture for twenty years. In professional sports excellence is defined by the organization's ability to win championships. This organization went from having the greatest leader and the greatest reputation to having no identifiable leaders and being dysfunctional. In an extremely competitive industry they have arguably the most dedicated customers. The company brand is identifiable all over the world, and even when they are the worst in their industry their customers stay faithful and hope for a revival. This company can teach us how to create a culture of excellence within an organization because they had it, and then they lost it. And now they need to find a way to do it again. If we study how they started and we understand how they lost their ability to cultivate excellence we can learn from the way that they rise again. The organization studied was the Cleveland Browns football team. The Browns had a great founder, Paul Brown, the father of modern football. Since the Browns fired Paul Brown they have not been able to reestablish the culture that led to eight championships in their first nineteen years as an organization. This project examines what they had that led to their culture of excellence, what they lost that has contributed to their recent failure, and if they can recreate a culture of excellence.
The Relationship of Artificial Intelligence and Humanity: *Andy*, the Analysis of a Screenplay

Naomi Sims

Student’s Majors: Political Science & Creative Writing
Faculty Sponsor: Dr. Maura Grady, English

Artificial Intelligence (AI) was once an idea only found in science-fiction. True AI, or Artificial Intelligence that is sentient, self-aware, and possesses a will, has not manifested yet but research suggests that the technology is fast approaching. The script explores the relationship between humanity and AI and the political implications of true AI in human communities. The screenplay follows the story of Andy, the world’s most advanced Android (the Android Y-Series), as he struggles to navigate relationships, exercise his autonomy, and embrace his humanity while working for a space tourism company where he is part of the mission team that is sending a spaceship full of tourists to catch a ride on Halley’s Comet. I chose to explore this topic through film as opposed to more formal academic mediums because film provokes thought and introspection by placing the viewer in the shoes of a character. Generally, AI is portrayed in very negative and terrifying ways in film. While that is one possibility, I am exploring the option of an AI that is not driven to destroy humanity but wants to be human. What would that look like? What rights should they have? How should we treat them? These are some philosophical, moral, and political questions I seek to answer by creating a fictional world and exploring what those relationships could look like. The oral presentation will consist of a synopsis of the screenplay and discussion of the process and research that informed the creative decisions taken in the script.
Oral Session V
2:00-3:00 p.m.
Faculty Room
Malicious Matriarchy: Exploring the Feminine Symbolism in *Como agua para chocolate*
Tyler Easton

Student’s Majors: Spanish & International Business
Faculty Sponsor: Dr. Jennifer Rathbun, Spanish

On November 20, 1910 the Mexican Revolution broke out as a result of Porfirio Díaz’s thirty-five year rule over the country. The armed struggle lasted for over a decade and it permeated every single aspect of life including Mexican literary production. As a result of the conflict, a new literary genre emerged - the novel of the Mexican Revolution. Initially these novels were written exclusively by male authors but the 1980s saw an emergence of female authors writing themselves into the narrative of the Mexican Revolution. In 1989 Laura Esquivel published her critically acclaimed novel *Como agua para chocolate* that was adapted for film in 1992. This essay unmasks the hidden symbolism associated with love, traditions, culture, magic, and food and their relationships with the female protagonists in the film. The main protagonist Tita, continuously struggles with her mother, Mamá Elena. However, there are specific symbols that certain characters exemplify. For example, the dangerous, ugly, and cruel fire that burns the birth certificate of Gertrudis is a manifestation of Mamá Elena’s control over her daughters. Despite the weight of matriarchal traditions held by authoritative figures like Mamá Elena, Tita is able to use food as an expression of her deepest emotions. Recognizing each symbol present in the film is integral to understanding the situations women experienced during the Mexican Revolution. The presentation of this essay will be in Spanish with a handout given to the audience in English.
Power, Politics, & Public: The Sublime & Depraved Uses of Zeppelins in Germany
Hendrick Stoops

Student’s Major: Political Science
Faculty Sponsor: Dr. René Paddags, Political Science

This study examines the political influences of and on Zeppelins, particularly in the Weimar and Nazi eras, in order to better understand their importance to the German people and government. In order to examine the topics contained within this scope, the study relies on primary documents, written by individuals who experienced the affairs of the airships at a close distance and those who acted, on both sides, as the arbiters thereof. In addition, material from the Luftschiffbau Zeppelin Archive is employed. By engaging with these varied texts, the sociopolitical movements of Zeppelins are explained through an examination of three ships in particular, each of which embodied the tensions and ambitions of its time, from the post-Versailles era, to the Weimar and Nazi governments: (a) the LZ-126 “Los Angeles” (post-Versailles); (b) the LZ-127 “Graf Zeppelin” (Weimar resurgence); and (c) the LZ-129 “Hindenburg” (Nazi Era & propaganda). In highlighting the links between the Zeppelins and sociopolitical identity, this study confirms that, while the story of German airships is generally reduced to its most basic and tragic elements, the endeavors of the Zeppelins offers a unique lens through which to view the ambitions and cataclysms of the early 20th century. Their careers represented to some a vision for peace and international commerce and to others an opportunity for political power and the projection of superiority both in the homeland and abroad. During the era of the large rigid airships, in their position as social, political, and ideological symbols, Zeppelins represented a powerful, indelible force in German politics and society.
To Which World Regions Does the Valence-Dominance Model of Social Perception Apply?

Savannah Lewis

Student’s Major: Psychology
Faculty Sponsor: Dr. Christopher R. Chartier, Psychology

The Psychological Science Accelerator (PSA) is a research consortium with the goal of making psychology more reliable and generalizable. The PSA has over 300 labs in over 50 countries who collaborate on shared studies. The PSA accepts submissions from researchers all around the world, selects the most interesting, and then conducts the selected studies in a set of the labs from the network (between 50 and 2000 labs per study). The first PSA study attempts to replicate Oosterhof and Todorov’s (2008) influential Valence-Dominance model of social perception. They had participants rate many faces on one of thirteen traits commonly used in person perception research (e.g., meanness, caringness, intelligence). Using factor analysis, they found that two overarching dimensions, Valence (intention to harm) and Dominance (ability to harm), drive social judgements on these traits. Our study will use these same methods in a large and diverse sample. Here, I report preliminary data from the 385 participants in the USA and Canada, but the full study will include over 10,000 participants in over 40 countries. So far, factor loadings are similar to those found by Oosterhof and Todorov. For example, trustworthiness and attractiveness ratings load highly on the Valence dimension and meanness and aggressiveness ratings load highly on the Dominance dimension. The full study will provide the largest ever test of the Valence-Dominance model, the largest data set in the history of face perception research, and involve more participating institutions than in any collaborative study in the history of psychological science.
Breaking the Barriers of Mental Health through Graphic Medicine: An Analysis of Ellen Forney’s *Marbles*
Erin Staley

Student’s Majors: Public Relations & Strategic Communication, Health & Risk Communication
Faculty Sponsors: Dr. Deleasa Randall-Griffiths & Dr. Daniel O’Rourke, Communication Studies

Medical illustration is a tool of the health profession used to educate doctors, nurses, and patients about the body and its infirmities. Even today, when technology can provide exact images of organs and their functions or dysfunctions, medical offices are adorned with colorful posters to offer patients a view of what a diagnosis means and how a procedure may correct the problem. But what if these illustrations could do more? What if they help break through the barriers between patients’ and practitioners’ perceptions of mental health? A group of medical professionals, artists, scholars, and writers created a movement called “Graphic Medicine” that combines images and narratives to tell the stories of patients. Graphic medicine mediums such as comic books can offer an interplay of words and images to offer a personal and powerful narrative of how it feels to be sick. In this presentation, I analyze Forney’s award winning book: *Marbles: Mania, Depression, Michelangelo and Me: A Graphic Memoir*. Forney is a graphic artist who was diagnosed with bipolar disorder. In her book, she tells the story of her diagnosis and her fears that treatment/medication might dull her artistic creativeness and alter her personality. During this presentation, I will discuss how graphic medicine offers a new means of expression for patients that can open different channels of communication between a patient and physician. I will analyze excerpts from *Marbles* to show how drawings and words can help a patient reclaim their own medical narrative.
Oral Session VI
3:15-4:15 p.m.
Trustees Room
Ingestion of or skin contact with heavy metals, particularly lead and cadmium, can cause detrimental health effects. Lead causes damage to the developing brain at extremely low concentrations. No safe level of exposure has been identified. Toxic effects of cadmium exposure include bone and kidney damage. The objective of this study was to assess potential metal exposures from decorated glassware. Lead and cadmium are commonly used in pigments for glassware decorations. Decorations on fifty glassware items were screened for heavy metals using a portable x-ray fluorescence spectrometer. Of 178 analyses performed on thirteen different colors on the glassware, lead ranged from no-detect to 290,000 ppm (median 68,000 ppm); 154 analyses were greater than no-detect. Cadmium ranged from no-detect to 26,000 ppm (median 1,800 ppm); 152 analyses were greater than no-detect. Wipe tests were digested, then analyzed by Inductively Coupled Plasma Spectrometry (ICP) for 107 glassware items to estimate how much lead and cadmium could be picked up through handling. Forty-one items yielded more than 10 micrograms of lead, and 15 items released more than 50 micrograms. Twelve glassware items yielded more than 5 micrograms of cadmium. Glassware decorated in the lip contact area (less than 20 millimeters from the rim) were extracted by placing the glass upside down in 4% acetic acid. Three of ten samples tested by ICP released concentrations of lead that exceeded 10 milligrams per liter. These results show that decorated glassware is a potentially significant source of heavy metal exposure, which should be thoroughly evaluated.
Feminismo en *Como agua para chocolate*  
Elizabeth Grim  

Student’s Major: Spanish Education  
Faculty Sponsor: Dr. Jennifer Rathbun, Spanish  

Mexican author Laura Esquivel’s debut novel, *Como agua para chocolate / Like Water for Chocolate*, became an instant international success in 1989. The book arose from a movement in the 1980s when Mexican female authors first began to publish female voices and experiences during the Mexican Revolution of 1910. Due to its success, the novel was adapted into a movie in 1992, which became, at that moment, the highest grossing Mexican national film ever and it sparked a new contemporary Golden Age in Mexican cinematography. The work, while centered primarily upon love, explores feminism and female roles exposing women’s strengths during a time of extreme violence and upheaval in the nation. Each one of the main characters, Mamá Elena, Gertrudis, Nacha, Pedro, Dr. John Brown, and Tita are analyzed throughout this essay as each play a vital role in displaying different forms of feminism. Mamá Elena is in the role of leader and protector of her family. Gertrudis is the independent and free spirited woman. Nacha takes on the role of caregiver and teacher. Pedro and Dr. John Brown show their desire to treat women equally and with respect. The main character, Tita, exemplifies feminism through her desire to live her life as she wishes. My presentation analyzes the feminist perspectives in the film and it will be delivered in Spanish, with a summary handout provided in English, in order to fully capture and reveal the intended influence of feminism in *Como agua para chocolate / Like Water for Chocolate*. 
Prisoners’ Rights are Human Rights
Kennedy Estridge

Student’s Majors: Business Management & Entrepreneurship
Faculty Sponsor: Dr. Maura Grady, English

After the terrors of the Holocaust the United Nations set forth a list of basic human rights that each human being would be entitled to. However, in America there are a group of human beings that have had their rights taken away for decades. Incarcerated individuals across the nation have had basic human rights taken from them. The Prisoners’ Rights Movement began in 1949 when a federal court applied the cruel and unusual clause of the Eighth amendment to a prison environment. This movement was founded on the beliefs that prisoners should still be treated as humans throughout their incarceration. Due to the lack of attention prisoners were getting, riots and revolts sprouted throughout prisons all over the United States. The prisoners of Attica Correctional Facility wrote a list of demands the facility had to meet in order for them to stop their riot. Incarcerated individuals have attempted to use the United States Constitution to regain rights that have been taken. Many lawsuits have been pushed aside due to the fact that prisoners have no status in society. The negative stigma put on prisoners by society will never change if citizens don’t change themselves. Drawing from scholarship in the field of American History, and testimonials from prisoners and advocates for prisoners, this presentation will respond to, and build upon, the scholarship in favor of legislating widespread and universal rights for incarcerated individuals.
Replication and Generalization of Conrad & Scheve’s 2017 study, “The Good, the Bad and the Male.”

Hannah Drake, Natalie Bisignano, & Tiffany Pryce

Students’ Major: Psychology
Faculty Sponsor: Dr. Diane Bonfiglio, Psychology

Conrad and Scheve (2017) examined endorsement of gender stereotypical beliefs regarding word valence in German-speaking participants. Participants were presented with a list containing three categories of words: neutral words, words that men view more positively than do women, and words that women view more positively than do men. Participants were asked to rate each word’s valence, and predict how other same-sex people in general would rate the word. Conrad and Scheve found that women’s self-ratings aligned with their predictions of how women in general would rate the words, whereas men’s self-ratings were less positive than their predictions of how men in general would rate the words. They suggested that male participants were attempting to distance their own ratings from the stereotypically male ratings. Our study sought to replicate that finding using an English-speaking sample. Eighteen male participants rated English words identified using an established, norm-referenced word database as neutral, more positive for men, or more positive for women. We conducted a t-test to determine whether participants’ self-ratings were less positive than their predictions of how men in general would rate the words. While we noticed a trend in the predicted direction, our results were not statistically significant, \( t(17) = 1.402, p = 0.089 \). However, our results are limited by small sample size. Our tests with seventy-four female participants also did not reveal a statistically significant difference, \( p(73) = 1.30, p = 0.099 \), which is in line with Conrad and Scheve’s findings that women do not reject own-gender stereotypes.
Oral Session VII
3:15-4:15 p.m.
Faculty Room
Connecting with the Saints: A Protestant’s Pilgrimage into the World of Relics

Kaitlyn Dailey

Student’s Majors: Health & Risk Communication, Public Relations & Strategic Communication, & Religion
Faculty Sponsor: Dr. Peter Slade, Religion

My research project seeks to understand the Roman Catholic practice of the veneration of relics. While Protestants consider the veneration of relics as being blasphemous, this is a central spiritual practice for Roman Catholics. Through my research, I hope to reconcile the two beliefs and determine if there is an appropriate place for this practice in Protestant piety. The methodology of the research project includes the study of the history and theology of the veneration of relics, as well as the popular piety of the Roman Catholic Church, and the writings of the Protestant Reformers Martin Luther and John Calvin. In addition, I conducted ethnographic research as a Protestant participant observer in Rome, Italy; Wittenberg, Germany through the Ashland University sponsored study away programs; and Maria Stein, Ohio. I took a narrative approach to writing the thesis by combining journal reflections from the trips, my personal emotions, and the theological justification to these experiences. The conclusion of the research project finds that there is much for a Protestant to learn and appreciate in the practice of the veneration of relics; however there can be no reconciliation between the Roman Catholic Church and the Protestant beliefs until more people have personally encountered the veneration of relics.
“I Think I’m Feeling Quite Ill”; a Chance Music Piece by Eric Watts

Eric Watts

Student’s Majors: Music & Computer Science
Faculty Sponsor: Dr. Scott Garlock, Music

Aleatoric music, or “chance music,” is a compositional technique in which one or several of the musical elements are decided by some form of randomization, leading to each performance being truly unique. Typically in music, the composer writes exactly what is to happen at any given time, meaning any performance of it is largely the same. Chance composers deconstruct this by giving much more freedom to the performers, which can be done in several ways. For example, in Jason Treuting’s “Nine Numbers” series for percussion, the player decides what musical figures to play based on a completed Sudoku puzzle chosen by the player. In this presentation I will be giving a performance of my own chance music piece (titled “I Think I’m Feeling Quite Ill,” featuring myself on trombone and Branden Barber on trumpet), in which the players randomly choose lines from a set of musical figures to play in any combination and order. Additionally, I will give a brief history of chance music, discuss what kinds of randomness and compositional decisions went into my piece, and explain how certain effects and figures were achieved.

Branden Barber will join Eric for the performance of this piece.
Examination of Using Light as a Baiting Technique for Adult and Larval Ambystomid Salamanders

Allyson Lombardo

Student’s Majors: Biology, Environmental Science, & Toxicology
Faculty Sponsor: Prof. Merrill Tawse, Biology

This study examined whether light could be used as a baiting technique to increase trapping success for adult and larval Ambystomid salamanders of the tiger, Jefferson, smallmouth, and spotted varieties. Sampling sites were located in Ashland and Richland counties behind Minnich Manufacturing and at Malabar Farms. Salamander/minnow style traps were set with varying arrangements based on the pools’ size and shape with alternating traps with or without light. Traps were placed in early February during breeding season to capture adult from May to June for larvae. Traps were set overnight, and the number of salamanders, were identified, sexed and recorded in the morning. Because of the difficulties identifying larva, those caught at Malabar Farms could not be accurately separated, while greater differences in appearance allowed the tiger and smallmouth larvae at Minnich to be determined. Adult tiger salamanders were caught in equal numbers in the traps with and without light, while adult smallmouth salamanders were caught in greater numbers in traps without light. No conclusions could be drawn about the Jefferson salamanders as the lights did not remain lit during the trial, so more data is being collected this year. Too few smallmouth larvae were captured to draw any conclusions. Tiger larvae were caught in equal numbers in traps with or without light. Larval salamanders at Malabar Farms were caught in larger numbers in traps with light. Therefore, light responses may differ based on species with larval salamanders caught in greater proportions in traps with light compared to the adults.
An Analysis of the Effect of Early Season Winning Percentage on Final Regular Season Winning Percentage
Emily Martin

Student’s Majors: Mathematics & Actuarial Science
Faculty Sponsor: Dr. Christopher Swanson, Mathematics

Mathematicians are actively trying to quantify many aspects of one of America’s favorite pastimes, sports, through various types of analysis. In this project, we will be answering the question, “How does early season winning percentage affect final regular season winning percentage?” focusing on theoretical probability. This question is an example of a conditional probability, the probability that an event occurs given another event occurs. We break down our general question into three different cases. First, we look at the case of a team having a constant probability of winning each game. Then we look at the case of a team having two different probabilities of winning each game, one for its first part of the season and one for its second part. Finally, we look at our most general case of a team having a different probability of winning each game. While these results can be generally applied to any sport and any league, after exploring our question with theoretical probabilities, we compare our theoretical results to statistics from the 1978 to 2017 seasons of the NFL. In this presentation, we will walk through the example of an NFL team that wins at least two of its first three games of a season to calculate the probability of it winning ten of its sixteen total regular season games.