

# Undergraduate Research Symposium Poster Presenter Abstracts

## Architecture and Environmental Design

**Name:** Alessandro De Angelis      **Arch 4210 research book**

**Major(s):** Architecture

**Institution:** Bowling Green State University

**Faculty Advisor(s):** Sara Khorshidifard, Architecture & Environmental Design

**Poster #: 1**

I will be discussing the book that we have put together using the students in class Arch 4210.

## Athletic Training Program

**Name:** Adam Paynter

**Major(s):** Athletic

Training/Pre-Physical Therapy

**Institution:** Bowling Green State University

**Faculty Advisor(s):** Elizabeth Walters, Athletic Training Program & Matt Laurent, CSCS

**Poster #: 2**

### **Designing an Overall Health Program for Individuals with Down Syndrome: A clinical Case Study**

**Objective:** To determine if an individualized, twelve week exercise plan and meal guide can initiate positive physiological and psychological changes, and thus increase quality of life for individuals with Down syndrome.

**Medical History:** Obesity, cardiovascular disease, and other vascular diseases are just a few conditions that individuals with Down syndrome are not born with, but commonly take shape after birth due to the complexity of genetic abnormalities associated with the disorder. The subject from this case study was an eighteen year old, moderately physically active female, with Down Syndrome. Before beginning the exercise program, a physician determined that the subject had no prior history of neck instability, heart conditions, or other exercise precautions common in individuals with Down syndrome.

**Treatment:** A food guide was established that included a portion-size guide, healthy substitutions, and visual food guide handouts. The subject participated in a twelve-week exercise program that focused on resistance training three times a week, and endurance exercise twice a week.

**Conclusions:** At the conclusion of the program, the subject will complete multiple post-program assessments. Expected results include an increase in muscle strength, decreased percent body fat, overall increased energy, and overall increased satisfaction with healthy lifestyle choices. The results could advance the research in this area, and possibly offer another resource to other individuals with Down syndrome, or clinicians working with patients with special needs, in order to help them achieve a higher quality of life.

## Biological Sciences

**Name:** Alec Brown

**Major(s):**

Biology/Biochemistry

**Institution:** Bowling Green State University

**Faculty Advisor(s):** Ray Larsen, Biology

**Poster #: 27**

### **Purification of the Bacteriophage $\phi$ 80 cor gene product**

The Escherichia coli ferric hydroxamate uptake receptor FhuA serves as the receptor for ferrichrome-Fe(III) complexes, with TonB protein energizing the active transport of the complex. The FhuA receptor is exploited by a variety of bacteriophages as a conduit into the cell. Interestingly, certain of these phages carry a gene called "Cor", the product of which, when cloned and expressed from a plasmid, blocks transport by FhuA. In the present study, components of the cor gene from the bacteriophage  $\phi$ 80 were used to construct an IPTG-inducible MalE-Cor-His6 fusion protein, which allowed for affinity purification of the Cor protein. At 61 residues in length, purified Cor protein was not readily demonstrable by standard SDS polyacrylamide gel electrophoresis. The purification of Cor protein via maltose-binding and IMAC chromatography as well as visualization of Cor protein by silver staining of samples resolved on Tricine-SDS polyacrylamide gels is described.

## Undergraduate Research Symposium Poster Presenter Abstracts

### Biological Sciences Cont.

**Name:** Mercedes Chumbley  
**Major(s):** Marine Biology  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Helen Michaels, Biology  
**Poster #:** 28

#### **Quality and Quantity:**

#### **Comparisons of sugar concentrations throughout one of the rarest habitat in the Midwest**

Without a thorough understanding of efficient ways to restore habitats for butterflies and other insect pollinators, the risk of them going extinct increases. Considering, pollinators and plants are in a mutually dependent relationship and more than 80% of Earth's angiosperms, flowering plants, are dependent on insect pollination, the loss of natural habitats could lead to a decline in pollinator numbers, including butterflies. One of the largest parts of restoring butterflies includes regulating their habitat. Natural habitats such as tallgrass prairies and oak savannas are important because these habitats supply pollinators with important food sources, and oak savannas in particular are now considered one of the rarest natural vegetation types in the world. To help restore habitats for these insect pollinators, it is essential to know what nectar sources are most beneficial. In knowing that, restoration plans can start implementing more efficient nectaring plants.

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**Name:** Jayna Clemens  
**Major(s):** Biology  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Luis Moreno, Ethnic Studies  
**Poster #:** 29

#### **Healthcare Leadership Institute**

For my Honors Project, I will create a curriculum for a healthcare, leadership program, the Healthcare Leadership Academy. The Healthcare Leadership Academy would be an opportunity for high school sophomores, of low socioeconomic status, to participate in a 28-week long curriculum, primarily intended to help them develop leadership skills, a professional mentorship relationship, and a better understanding of the variety and diversity of professions in the healthcare field. The Healthcare Leadership Academy would also include a weeklong international service trip after the completion of the curriculum. In total, the program would last the duration of one academic year, with the service trip-taking place at the beginning of summer break before they begin their junior year. The international service trip would not only allow them the opportunity to apply their knowledge gained through the program, but it will immerse them in a different culture and healthcare environment. This experience would help them think about healthcare from a global perspective, while inspiring them to continue their career endeavors in healthcare.

The objectives for the Healthcare Leadership Program include, demonstrating understanding of personal growth and servant leadership through completion of comprehensive assessments, finding their purpose within the healthcare field, understanding the diversity and multitude of career paths within the healthcare field, fostering a mentorship relationship with a professional healthcare mentor, developing skills to effectively network, and leverage resources to have a successful college admissions process.

## Undergraduate Research Symposium Poster Presenter Abstracts

### Biological Sciences Cont.

**Name:** Renee Dollard  
**Major(s):** Department of Biology  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Ronald Woodruff, Biology  
**Poster #:** 30  
**Additional Authors:** Ashley M Evertt, Daniel R. Rochester, Christopher J. Schimmoeller

#### Chemical stress and recombination in *Drosophila melanogaster*

Previous studies conducted by Gowen, Stern, Nee, Singh and Parsons have indicated that rates of recombination in *Drosophila melanogaster* may be influenced by environmental stressors. Increase in the frequency of recombination provides a mechanism by which organisms may be able to quickly generate genetic variation which may promote adult survival. The purpose of this study was to investigate whether chemical stressors impacted the frequency of recombination. Parental generations of *Drosophila melanogaster* were exposed to two stressors: copper sulfate and temperatures of 30°C. The rate of recombination between the singed and white loci were measured in the offspring. While the use of temperature in the experiment acted as a positive control, no significant change was seen between the control group of flies and the flies exposed to 30°C. The reason for lack in significance between the control and temperature treated *D. melanogaster* is unknown. All though, unequal effects of temperature on recombination events across the genome is a possible explanation. Groups of *D. melanogaster* exposed to coppersulfate showed decreased numbers of progeny. Reduced viability of the groups treated with coppersulfate may be linked to the percent recombination. For example, certain recombinants may be sensitive to coppersulfate. Recombination rates may also be related to the effects of nutrition on recombination. For example, it has been observed that treatment of mice with endocrine disrupting chemicals reduces recombination (Vrooman et al., 2015). Future studies may replicate treatments of coppersulfate with higher progeny counts. Future studies may also focus on rates of recombination between different genes to investigate whether or not chemical stressors impact recombination equally throughout the genome.

**Name:** Rachel Drown  
**Major(s):** Biology  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Eileen Underwood, Biology  
**Poster #:** 31

#### Color Variation of *Rhacodactylus auriculatus* in Routine Care

*Rhacodactylus auriculatus* (gargoyle gecko) is a popular gecko species in the pet trade. Color changes have been observed and documented, but the conditions that induce them remain unclear. This study aimed to test the effects of age/development, temperature, and time of a day on color variation.

**Name:** Ashley Everett  
**Major(s):** Biochemistry  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Ron Woodruff, Biology  
**Poster #:** 32  
**Additional Authors:** Renee Elizabeth Dollard, Daniel R. Rochester, Christopher J. Schimmoeller, Michael A. Balinski, R. C. Woodruff

#### Chemical Stress and Recombination in *Drosophila melanogaster*

Environmental stressors, such as temperature and nutritional stressors, are known to influence recombination frequencies. Increases in the frequency of recombination have been observed in *Drosophila melanogaster* when exposed to such conditions, which produces an immediate increase in genetic variation, potentially allowing for survival. In this study, copper sulfate was mixed with the food of *Drosophila melanogaster* and the offspring were tested for an altered recombination frequency for X-chromosome linked markers, determining if exposure to chemical stressors can also influence recombination frequencies. Females heterozygous for X-linked visible mutant markers *w* (white eyes) and *sn3* (small, singed bristles) and males with these same mutant markers on their single X chromosome were treated with 0.1, 0.2, 0.3, and 2.5 mM concentrations of copper sulfate mixed into their instant food. These treatments were compared to a control group that was treated with water. The progeny were scored as either recombinants (red eyes and singed bristles or white eyes and long bristles) or non-recombinants (red eyes and long bristles or white eyes and singed bristles). In addition to the copper sulfate treatments, a high temperature, 30°C treatment, which is known to increase recombination frequency, was used as a positive control. The Fisher exact test was used to compare the frequency of recombination between the *w* and *sn3* interval in the treatments. Although the hypothesis was that the high temperature and copper sulfate treatments would increase the recombination frequency, it was observed that neither copper sulfate nor high temperature significantly changed recombination.

## Undergraduate Research Symposium Poster Presenter Abstracts

### Biological Sciences Cont.

**Name:** Andrea Fisher  
**Major(s):** Marine and Aquatic Biology  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Paul Moore, Biology  
**Poster #:** 33  
**Additional Authors:** Kate Lowry

#### **Comparative Homing Behaviors in Two Species of Crayfish, *Fallicambarus Fodiens* and *Orconectes Rusticus***

In terms of homing behaviors, the most well documented examples are vertebrates, such as sea turtles and salmon, and invertebrates, specifically fiddler crabs, desert ants, and crayfish. Crayfish can be considered excellent models for research because of the extensive literature on these organisms combined with their relatively simple nervous systems. Two species of crayfish were used in this study, *Fallicambarus Fodiens* and *Orconectes Rusticus*, due to their roles as primary and tertiary burrowers, respectively, and their relatively high abundance in northern Ohio. The animal's ability to home to an artificial burrow in a controlled laboratory tank were analyzed by digitizing the crayfish's movements, taking into account the individuals walking speed, velocity and heading angle relative to burrows, total distance traveled, and path angles. After the crayfish were placed into the tank and motivated to leave the burrow by the presence of food, both species of crayfish were found to successfully return to the burrow. However, *F. fodiens* had a higher homing success rate than *O. Rusticus*. Walking speeds of the crayfish were shown to almost double, and heading angles were much closer to 0 compared to their outward movements from the burrow in both species. These findings show that *O. rusticus* and *F. fodiens* can home to their burrow without the usage of a visual landmark. *F. fodiens* appeared to find the burrow more easily with straighter return paths. These differences may be explained by the variation in burrow use between primary and tertiary burrowers.

**Name:** William Gyurgyik  
**Major(s):** Biology  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Eileen Underwood, Biology  
**Poster #:** 34

#### **Fertility and Mortality in Corn Snakes with the "Odd" Trait**

This study involves ongoing research on corn snakes (*Pantherophis guttatus guttatus*) carrying the "odd" trait. Our goal was to compare fertility and mortality between "odd" and non-"odd" corn snakes.

**Name:** Chris Hicks  
**Major(s):** Biochemistry  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Alexander Tarnovsky, Chemistry  
**Poster #:** 35  
**Additional Authors:** Darya Budkina, Sergey Matveev

#### **Tracing the Nuclear Dynamics Involved in Carbon-Halogen Bond Cleavage in Real Time**

Understanding which bonds are broken and how this occurs in photochemical reactions is essential to elucidate the reaction's mechanism. This knowledge can be used to tune properties of compounds with the aim to improve their practical applications. Diiodomethane ( $\text{CH}_2\text{I}_2$ ), a naturally occurring organic iodine compound, is of particular interest because it is in the atmosphere and plays a key role in ozone layer depletion. It is proposed that, in solution,  $\text{CH}_2\text{I}_2$  forms a radical pair after absorption of light, which recombines into an isomer with an I-I bond, iso- $\text{CH}_2\text{I}-\text{I}$ . However, it has been shown in the gas-phase that iso- $\text{CH}_2\text{I}-\text{I}$  is formed directly, involving no radicals. Currently, there is no evidence of this process in solution. This process occurs in the gas-phase on a sub-100 fs (1 fs=  $10^{-15}$  s) timescale and a similar timescale is expected in solution, making them very challenging to observe. In the gas-phase, the direct isomer product is short-lived and decays to the radical pair quickly because of the lack of internal energy dissipation. Using a home-built laser system, with pulse durations compressed to  $\sim 45$  fs, ultrafast transient absorption spectroscopy is utilized in our laboratories to resolve isomerization dynamics with 20 fs temporal resolution. Specifically, a 330 nm pump pulse populates the first excited state of the  $\text{CH}_2\text{I}_2$  molecule. Absorption by the  $\text{CH}_2\text{I}$  radical is monitored using the 300 nm probe pulse and, if delayed, presence of an intermediate other than  $\text{CH}_2\text{I}$  is confirmed, providing evidence for the direct isomer as a precursor of the radical.

## Undergraduate Research Symposium Poster Presenter Abstracts

### Biological Sciences Cont.

**Name:** Haley Ingram

**Major(s):** Biology

**Institution:** Bowling Green State University

**Faculty Advisor(s):** Kevin McCluney, Biology

**Poster #:** 36

**Additional Authors:** Melanie Marshall

### **The effects of framing devices on the perception of environmental quality**

#### Background/Methods

Northwestern Ohio is a region heavily reliant on agriculture and industry; as a result, concerns about water and environmental quality are numerous. One of science's greatest challenges is presenting information in an accessible way without misrepresenting findings or supporting incorrect viewpoints. In studying how manipulation affects opinions, scientists can learn the best techniques for presenting information in an interesting and engaging way without, even unintentionally, manipulating the reader's emotions or opinions.

We surveyed residents of NW Ohio, asking for their opinion of the quality of their local environment and what factors they thought might contribute to environmental quality. Each survey contained at random one of four statements, each employing a different framing device, which tested to see which device, if any, was most influential. After this statement, participants were again asked about the quality of their local environment and factors that contributed to it. Surveys were conducted online, through the mail, and in person.

#### Conclusion/Results:

We found that participants who took the survey online were more likely to change their opinions after reading either the factually -framed statement or the emotionally-framed statement, rather than the normatively-framed statement as the literature suggests. Participants who took the survey in person or via mail were more likely to change their opinion after reading the emotional normative statement. In both trials the normatively-framed statement was the least likely to change participants' opinions.

**Name:** Kaitlin Richard

**Major(s):** Biology

**Institution:** Bowling Green State University

**Faculty Advisor(s):** Kaitlin Richard, Biology

**Poster #:** 37

### **Comparison of commercial gecko food on growth of *Rhacodactylus geckos***

A study was done on the food sources that are available to the public for gecko species in captivity. A specific species was chosen, gargoyle geckos, and their growth over a 14 week period was tracked. Three groups of twelve animals were offered different foods and the results were statistically analyzed.

**Name:** Daniel Rochester

**Major(s):** Biology Pre-Med

**Institution:** Bowling Green State University

**Faculty Advisor(s):** Ron Woodruff, Biology

**Poster #:** 38

**Additional Authors:** Chris Schimmoeller

### **Determining the Presence of a New Species of *Drosophila melanogaster***

One of the toughest questions to answer in science is, What is a species? The definition of what a species is that is most accepted is: a species is a group of organisms that is reproductively isolated from other organisms. The goal of this experiment was to determine if two lines of *Drosophila melanogaster* were two different species, or if they were the same species but with some differences caused by mutations or other factors. We had two strains of *drosophila*; one was a wild type Canton-S (CS) strain, and the other was a possible new species strain with white eyes. Our hypothesis is that the white-eyed "new species" strain is a new species of *Drosophila*. We crossed "new species" virgin females with CS males, and CS virgin females with "new species" males. In both cases progeny was observed, but they died in the late pupil stage. The fact that the two lines were able to reproduce, supports the idea that the two lines are not different species, but the lack of adult offspring suggests they are different species. By comparing our results with results from other studies, we determined that the two lines of *Drosophila melanogaster* were not two different species, but that the "new species" line was the same species, but it had a chromosomal rearrangement. The "new species" line had a compound second chromosome that resulted in the progeny dying in during development.

## Undergraduate Research Symposium Poster Presenter Abstracts

### Biological Sciences Cont.

**Name:** Hannah Scheppler

**Major(s):** Biology

**Institution:** Bowling Green State University

**Faculty Advisor(s):** Juan Bouzat, Biology

**Poster #:** 39

**Additional Authors:** Gabriella Arauco-Shapiro

#### **Characterization of Avian Sexing Marker in *Spheniscus Magellanicus***

Magellanic penguins (*Spheniscus magellanicus*) inhabit areas along the coast of Patagonia, including colonies on both the Atlantic and Pacific.

Phylogenetic studies have used autosomal markers to reveal the metapopulation dynamics of Magellanic penguins. Sex markers can potentially answer additional questions, like the sex of parental introgression within hybrids. Sex markers can also track maternity since the W is only inherited from female parents. Potential hybrids have been speculated along the coasts of Chiloe where Humboldt (*S. humboldti*) and Magellanic penguins both reside.

We chose primers that are typically used to sex avian species. The primers target an intron within the chromodomain-helicase-DNA-binding protein 1 gene.

We extracted DNA from 7 colonies of Magellanic penguins. We then used PCR and cloned the products. In total we used 153 sequences.

Sequences were confirmed by locating the haplotype in another clone, whether from the same individual or other individuals.

The analysis resulted in 5 apparent Z-linked alleles and 3 W-linked alleles. Phylogenetic analyses show distinct grouping of the W and Z sequences (Figure 2).

**Name:** Christopher Schimmoeller

**Major(s):** Biology

**Institution:** Bowling Green State University

**Faculty Advisor(s):** Ron Woodruff, Biology

**Poster #:** 40

**Additional Authors:** Daniel R. Rochester, Lindsay A. Honigford, Michael A. Balinski

#### **Determining the Presence of a New Species of *Drosophila melanogaster***

One of the toughest questions to answer in science is, What is a species? Many people think that they know the answer, but once they start thinking about that question they realize that it is a hard question to answer. The definition of what a species is that is most accepted is that a species is a group or organisms that is reproductively isolated from other organisms. The goal of this experiment was to determine if two lines of *Drosophila melanogaster* were two different species or if they were the same species, but with some differences caused by mutations or other factors. Our hypothesis is that the white-eyed "new species" strain is a new species of *Drosophila*. However, our experiments supported the idea that the two lines were not different species, but had some different characteristics based on a chromosomal rearrangement.

**Name:** Preston Thompson

**Major(s):** Biology Specialization Ecology & Conservation

**Institution:** Bowling Green State University

**Faculty Advisor(s):** Andrew Gregory, School of Earth, Environment & Society

**Poster #:** 41

#### **Measuring Gene Flow Among Existing Prairie Remnants and Native Prairie Restoration Sites at Oak Openings Reserve**

Located in northwest Ohio, the Oak Openings Metro Park is a crown jewel of the Toledo Metro Parks organization. With a plethora of different habitats in close proximity, the region is comprised of a unique system of different landscapes. Thus, making the Oak Openings region a home to a vast amount of animal and plant species, with a high amount of biodiversity, compared to the surrounding landscape.

My project is centered on a native prairie known, and currently in the process of being restored. The site is located on a corner of Dorr and Irwin, is formally an agricultural landscape.

Adjacent to the restored prairie is a wild source of Big Blue Stem. The goal of my experiment is to test whether the wild source genes are entering the population of the restored prairie. This scenario would increase genetic diversity within the population of the restored prairie.

In the fall of 2015, the ENVS 3100 taught by Dr. Andrew Gregory, in conjunction with the TMP Native Seed Nursery and TMP staff, collected samples of Big Blue Stem from both the restored prairie and TMP Big Blue Stem cultivar sources.

These random samples of Big Blue Stem will be genetically compared to each other. The reason for this study is to see if the wild source of Big Blue Stem is increasing the genetic diversity of the Big Blue Stem within the native prairie currently undergoing restoration.

## Undergraduate Research Symposium Poster Presenter Abstracts

### Biological Sciences Cont.

**Name:** Emily Warner  
**Major(s):** Biology  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Raymond Larsen, Biology  
**Poster #:** 42

#### **Phage Isolates from Caprine and Pseudo-Camelid Fecal Samples**

To address the ultimate question of how proteins are able to interact with each other we look to the TonB energy transduction system in *Escherichia coli* as a model. Up to this point, studies have been concentrated on characterizing the mechanisms of the model. By taking an alternative approach to studying this model we are able to gain additional insights. The alternative method that lends itself to this research is bacterial viruses (phage) that are able to utilize the TonB system. In these phage, evolution of proteins has allowed for the evasion of the external defensive barrier of the cell by hijacking the large nutrient pathways into the cell. Understanding the interactions between the phage proteins and those of the host cell that ultimately cause the change in the functionality of the host proteins allows for greater understanding of the model as whole. Our initial efforts have used the several phage known to exploit the TonB system. We subsequently isolated a number of new phage from *E. coli* recovered from horses, the characterization of which has allowed us to identify several new phage genes that make proteins that allow the phage to use the TonB system. To further understand this system we need to look at a greater diversity of phage, and have begun to isolate them from other sources. At the beginning of this semester I isolated a new phage in from domestic llama at a small Northwest Ohio farm that houses domestic camelids and caprines. By obtaining more samples we will be able to isolate more phage from the coliforms and from there, using gene sequencing, determine the genes that cause the variation in the ability to utilize the TonB system.

**Name:** Rachel Wilson  
**Major(s):** Biology  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Vipa Phuntumart, Biology  
**Poster #:** 43

#### **The effect of Copper Sulfate on *Saprolegnia salmonis***

This research looked at the effect of Copper Sulfate on *Saprolegnia salmonis*. Copper Sulfate is a component in pesticides and has been used in the United States since 1956. The toxicity comes from copper's ability to bind to proteins in the pathogen which in turn cause damage to the cells and leads to death. *Saprolegnia salmonis* is a type of oomycete, as known as a water mold, which can cause lesions on fish, and is a major problem for fish farms. The application of this research is the many fish farmers have been plagued with "disappearing" fish over the winter months. This is has been attributed to Winterkill, when fish die from lack of oxygen. This phenomenon has been blamed on many causes, but in the case studied the main culprit is *Saprolegnia salmonis*. Currently, the method used to treat Winterkill is a copper sulfate treatment. However, this treatment is based on anecdotal evidence and the research will look at how effective copper sulfate will inhibit the growth of *Saprolegnia salmonis*.

**Name:** Matt Zach  
**Major(s):** Biology, specialization in Ecology and Conservation  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Kevin McCluney, Biology  
**Poster #:** 44

#### **Prey hydration influences wolf spider predation**

The initial funds provided by the spring grant will help conduct evaporative water loss trials. These trials will develop curves of invertebrate evaporation water loss and assist me in designing prey trials that quantify an invertebrate predator's ability to regain water through its prey's level of hydration.

**Name:** Hallie Zimmer  
**Major(s):** Biochemistry and Biology  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Ray Larsen, Biology  
**Poster #:** 45

#### **Bacteriophage EMS9: preliminary genomic description**

EMS9 is a bacteriophage that was recently isolated from an *Escherichia coli* strain present in horse feces. Bacteriophage EMS9 consists of 98,771 base pairs that are organized into 139 predicted open reading frames (ORFs). These predicted genes potentially encode specific bacteriophage proteins. The genomic sequence of bacteriophage EMS9 is arranged into three groups: early, middle, and late genes. Considerable homology between the ORFs of bacteriophage EMS9 and bacteriophages T5 and H8 exists. All of these bacteriophages are believed to use a rare two-step transfer mechanism to invade host cells. This annotation of the genomic sequence of EMS9 will provide a foundation for a further gene-by-gene analysis and comparison to other similar bacteriophages.

# Undergraduate Research Symposium Poster Presenter Abstracts

## Chemistry

**Name:** Jacob Chesnick

**Major(s):** Chemistry

**Institution:** Bowling Green State University

**Faculty Advisor(s):** Jeremy K. Klosterman, Chemistry

**Poster #:** 46

### Towards Organic Photoacids for Metal-Organic Materials

We present the synthesis of 5-bromo-8-iodo-naphth-2-ol, a key building block that, upon further structural elaboration with carboxylic acids, will enable the assembly of metal-organic structures, via binding of metal ions, containing photoresponsive organic ligands. Naphthol is a known photo-acid which, upon irradiation, reaches an excited energy state; this excited state is characterized increased disassociation of the naphtholic proton. Within the porous confines of metal-organic frameworks, release of a single proton can drastically alter the local pH to reach superacidic conditions ( $\text{pH} > 0$ ) upon application of a light trigger.

**Name:** Elizabeth Crowther

**Major(s):** Chemistry & Environmental Science

**Institution:** Bowling Green State University

**Faculty Advisor(s):** W. Robert Midden, Chemistry

**Poster #:** 47

**Additional Authors:** Nicholas Bischoff; Gabrielle German; Ann Howard; Ashley Lochtefeld; Natalie Miller; Ethan Peters; Richard Williams

### Performance Appraisal of a Novel Manure Treatment Process at Laboratory Scale

The aim of this project is to develop a manure treatment process that removes excess water from CAFO manure while sequestering nutrients needed for optimal crop growth, converting it into a slow-release fertilizer. Dilute CAFO manure, often containing up to ninety-five percent water, is costly to transport and sell relative to its fertilizer value. This may lead to over-fertilizing of fields, causing large amounts of nutrient runoff. The excess phosphate and nitrate in this runoff can lead to the growth of harmful algal blooms in waterways. Converting the manure into a solid dry fertilizer allows for a near twenty-fold decrease in the cost of its transportation and storage. In this process, the addition of a cationic polymer and a coagulant provide solid-liquid separation, allowing for the removal of excess water. The polymer also binds to phosphate and nitrate in the manure, and over time releases these nutrients to be available for crops. A variety of polymers have been tested to determine which maximizes coagulation and promotes effective filtration of the manure solids. Treated and raw manure are then mixed with soil, and lab scale rain simulations are performed to compare the rates of release of ortho-phosphate, nitrate + nitrite, and ammonia. The optimal treatment is one that would be cost-effective and would minimize nutrient runoff while releasing nutrients at a steady rate to be absorbed by crops.

**Name:** Elizabeth Crowther

**Major(s):** Chemistry & Environmental Science

**Institution:** Bowling Green State University

**Faculty Advisor(s):** W. Robert Midden, Chemistry

**Poster #:** 48

**Additional Authors:** Nicholas Bischoff; Gabrielle German; Ann Howard; Ashley Lochtefeld; Natalie Miller; Ethan Peters; Richard Williams

### Analysis of Baseline Soil Nutrients at the OSU Northwest Agricultural Research Station

The aim of this research is to obtain baseline nutrient levels of eight soil plots at the Ohio State University Northwest Agricultural Research Station for the purpose of performing future tests with confident data readability. Groundwater and surface rain runoff have been collected and analyzed for dissolved ortho-phosphate, nitrate + nitrite, and ammonia, as well as total phosphorus and nitrogen. These background nutrient levels will allow us to create a profile of the plots prior to the addition of treated or raw manure. Manure is treated with a cationic polymer and a coagulant to reduce the amount of excess water and to sequester nutrients needed for optimal crop growth. Once the most optimal treatment is determined, the treated manure will be applied to a number of these plots. Nutrient levels released from these plots when it rains will be compared to those released from control plots and plots treated with raw manure. Collecting baseline soil nutrient data is crucial to characterizing these soil plots and determining the true levels of nutrients released from the applied treated and raw manure.

**Name:** David Darr

**Major(s):** Chemistry

**Institution:** Bowling Green State University

**Faculty Advisor(s):** Jeremy K. Klosterman, Chemistry

**Poster #:** 49

### Synthesis of Highly-Twisted Aromatic Ligands for MOFs

Bifluorenylidene is an intriguing compound due to the unusual conformations that exists on its central double bond. Altering the steric profile, by adding methyls or changing ring sizes, can alter the conformation about the central alkene and the extent of conjugation. Alternatively, one could lock the molecule into a more planar geometry by tethering the two halves within a rigid framework. Here we report the synthetic progress towards making 3,3',6,6'-tetracarboxylatebifluorenylidene (1). Conversion to a tetra carboxylate bifluorenylidene would be suitable for the formation of metal-organic frameworks, allowing for such molecular tethering.



## Undergraduate Research Symposium Poster Presenter Abstracts

### Chemistry Cont.

**Name:** Laura Skebba  
**Major(s):** Chemistry  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Jeremy Klosterman, Chemistry  
**Poster #:** 51

#### **Improved Synthesis of Naphthol-based Photoacids for Controlling the pH at the Surface of Nanoparticles**

The reduction of water is pH sensitive and proceeds faster under acidic (low pH) conditions. Photoacids offer a site-specific trigger where the pH of the local environment is lowered upon photo irradiation. Here we present synthetic progress towards a naphthol-based photoacid that can be covalently attached to the surface of a nanoparticle catalyst for the photoreduction of water. We coupled a protected thiol-propyl linker to 8-amino-2-naphthol through EDC and HOBt catalyzed amide bond formation. After deprotection of the thiol, the N-(7-hydroxynaphthalen-1-yl)-3-mercaptoopropanamide photoacid will be ready to attach to the nanoparticle surface. The overall goal of this project is to make the water splitting process energetically cost efficient. If successful, solar powered hydrogen production from water should become more efficient and a great renewable energy source could become much more readily available.

**Name:** William Sberna  
**Major(s):** Radiological Technology  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Subha Nagarajan, Chemistry  
**Poster #:** 52

#### **An investigation of the anti-microbial activity of curcumin and polymerized green tea extracts.**

Antimicrobial resistance is a well-recognized growing global threat. With a growing increase in antibiotic resistant infections, there is an imminent need to develop new class of effective antimicrobials. Among the different classes of naturally occurring compounds, green tea catechins and curcumin have been investigated widely for their anti-microbial activity. Four major catechins found in green tea – epicatechin, epicatechin-3-gallate (ECG), epigallocatechin (EGC), and epigallocatechin-3-gallate (EGCG) have been shown to exhibit good anti-microbial activity through a variety of mechanisms. While green tea has shown to exhibit promising anti-bacterial activity, the variability in the composition of green tea, and low solubility of EGCG in water is still a concern. Curcumin, a naturally occurring compound from turmeric has been known to exhibit good synergistic activity with green tea catechins. The use of curcumin in anti-bacterial applications has been severely limited because of its poor solubility in water (11ng/ml). This leads to very poor absorption in the body, fast metabolism, and quick systemic elimination. To overcome some of the limitations of naturally occurring catechins, these compounds were polymerized using environmentally benign methods involving use of naturally occurring enzymes as catalysts. The anti-bacterial activity of these compounds against both gram positive and gram negative bacteria was evaluated using disk diffusion and minimum inhibitory concentration (MIC) assays. A significant challenge was to determine reaction conditions and solvents which did not affect the MIC. Preliminary results on the anti-microbial activity of these compounds will be presented.

### Communication

**Name:** Drew Ashby-King  
**Major(s):** Communication  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Lisa Hanasono, Communication  
**Poster #:** 3

#### **#BG4Unity: Testing the effectiveness of a social media advocacy workshop**

Social media is not only a form of communication that surrounds one's personal life, but it has also become a platform for expressing opinions and advocating for social change. Using #BG4Unity, an anti-hate social media campaign, as a foundation I developed a workshop that aims to educate participants on the value of diversity and to increase their social media activism skills. This study found that the workshop increased participant's attitudes toward diversity, social media activism skills, and that those who attended the workshop had increased attitudes toward diversity and social media activism skills compared to those who did not attend the workshop.

## Undergraduate Research Symposium Poster Presenter Abstracts

### Communication Cont.

**Name:** Krystal Ingman  
**Major(s):** Communication  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Ewart Skinner, Telecommunication  
**Poster #: 4**

#### **The Creation, Sharing, and Promotion of Japanese Media and Popular Culture on Tumblr: Exposure to Internationality in Early Adulthood**

New media technologies enable people all around the globe to be exposed to a larger variety of cultural products. Social media networking and blogging sites like Facebook, YouTube, Twitter, WordPress and Tumblr, have offered users easy access to media from different cultures. Images and symbols inspired by Japanese culture is just one example of cultural products that are gaining popularity among the Internet users. This research presents a study of people who regularly create, share, comment or otherwise engage with the cultural products related to Japanese media and entertainment such as anime, manga, and other art on the micro blogging site of Tumblr. Generally, the users who are interested in engaging with such content are young people all around the globe. It can be argued they are part of growing "global youth culture." The goal of this study is to examine what kinds of Japanese inspired digital texts and symbols are being created and shared by this kind of user and to examine in what ways this kind of media is contributing to constructing a shared sense of belonging to global youth culture and articulating their identities. This research argues that regular exposure to content from other cultures may have a positive effect on young people's interest in different cultures and thus form more fluid cultural identities that are open to global collaboration and cooperation.

**Name:** Kelsey Lortz  
**Major(s):** Creative Writing, Scientific and Technical Communication  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Jerry Schnepf, Visual Communication Technology  
**Poster #: 5**

#### **Digital Poetry: Writing for the Electronic Medium**

More than plain text on a screen, digital poetry is a performance and an engagement with a user/reader through text, images, videos audio, animation, and/or game-like structures. As our technology has advanced, so has this genre evolved, now including a spectrum of sub-genres like multimedia and interactive poetry. To explore the capabilities and value of digital poetry, I created six digital poems that capture part of the spectrum. Four I adapted from poems I've written previously. Two I wrote and designed for the screen simultaneously. Then I reflected on the process for both, considering how the experience might have any ramifications on my traditional writing process and more ways to integrate an art form like poetry with other disciplines.

**Name:** Valerie Skorupski  
**Major(s):** Communication  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Lisa Hanasono, Communication  
**Poster #: 6**

#### **Social Media and Civic Engagement**

Social media is a trending phenomena that researchers are still studying. Drawing from the dual-process theory, this poster explains social media and civic engagement. We looked closely at why some social media messages were more persuasive and impactful than others in reference to anti-discrimination. We predicted that certain factors would apply to the crafter's ability (i.e. knowledge about the discrimination and social media efficacy) as well as motivational factors (i.e. perceptions about the severity of the discrimination as well as the relevance of the discrimination to the crafter) that these would affect the quality and impact of these anti-hate messages. Our results support the dual-process approach providing evidence of ability and motivational factors. Motivational factors were found to be more impactful to anti-discriminatory message crafting. We had conducted this research using 480 adults living in North West Ohio with diverse classifications. Participants completed questionnaires to measure their (a) social media advocacy effectiveness, (b) knowledge about discrimination, (c) social media activism efficacy, (d) problem severity, and (e) problem relevance. Most of our predictions were supported, however there were some unexpected results. As we thought, all of our motivation and ability factors proved to be statistically significant, but upon further inspection it was surprisingly found that knowledge of the discrimination was not statistically significant to predict the effectiveness of the message. Instead, social media efficacy, severity, and relevance showed to be closely tied to message effectiveness and impact. We also found that people with higher perceived skills in social media efficacy, severity, and relevance had a positive correlation to one's effectiveness at crafting anti-hate, anti-discriminatory messages on social media sites.

## Undergraduate Research Symposium Poster Presenter Abstracts

### Communication Cont.

**Name:** Jessica Smorul  
**Major(s):** Communication  
**Institution:** Bowling Green State University, Firelands Campus  
**Faculty Advisor(s):** Ray Schuck, Humanities  
**Poster #:** 7

#### **"What's Best For Business - An Ethnographic Study of the WWE Universe"**

I am conducting an ethnographic study of WWE fans, specifically those who are most heavily invested. These fans are known in the industry as "smarks" or "smarts". The smarts are slightly more invested and knowledgeable, and often times more critical of the program. Smark and Smart Fans are incredibly aware that the show has a script and matches are pre-determined. The wrestlers are incredibly in-shape and athletic, fans don't diminish those traits. However, it is through character development and believable story-telling devices that a Superstar earns the respect and admiration of those fans. Although athletic ability is definitely significant and respected, ultimately a wrestler is deemed "good" when he or she displays the ability to engage the audience via "cutting promos" and his or her ability to make his opponents look better in matches as well. Through interviews and fan observation, I wish to better understand this fan culture through highlighting the language of the fans, common fan practices, and most specifically the ways in which these fans influence the show's production and direction of the storyline.

This ethnography of WWE fan culture will specifically focus on intercommunication by the fans by way of Henry Jenkins' participatory culture and the concept of collective cultural intelligence. I will refer to the WWE shows as a performance, not as an athletic contest. The WWE Universe is diverse, but in general they operate under the same unofficial guidelines from across the globe. In the WWE, collective intelligence can be applicable to both character narratives and real life biographies. Smarks and smarts share their opinion and bond via the depth of their knowledge and the similarities of their personal fantasy bookings. Fan interaction with each other is a very significant aspect of the WWE, as it often leads to what Jenkins refers to as "grassroots efforts to save programs or protest unpopular developments." This is where the WWE differs from any other televised programming, be it sport or drama. Soap opera fans will never influence writers enough to dramatically alter the story, nor can a sports fan alter the result of a competition. I will highlight specific WWE events in which this concept is demonstrated.

**Name:** Amanda Spangenberg  
**Major(s):** Communication Sciences and Disorders  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Colleen Fitzgerald, Communication Sciences & Disorders  
**Poster #:** 8

#### **Promoting Quality Input: The Influence of Copula in Child-Directed Speech on Toddlers' Subject-Copula Combinations**

It is well established in the language acquisition literature that parents' input to children plays a significant role in their grammatical development (Newport, Gleitman, & Gleitman, 1977). Parents' use of copula (i.e., is, am, are, was, were) has been shown to predict children's subsequent use of copula (Proctor-Williams, et al., 2001). However, less attention has been paid to a phenomenon known as limited scope formulae. Limited scope formulae include rote, stereotypical phrases such as "What's that," "It's a," and "That's a" (Braine, 1976). This study examined the two research questions, 1) How do parents vary in their use of limited scope formulae? and 2) How does parents' use of limited scope formulae affect children's future subject-copula combinations? Data from transcripts of 11 parents interacting with their typically developing, monolingual English-speaking children were collected and coded. Parent utterances were analyzed when children were 23 months old and child utterances were analyzed when children were 27 months old and 33 months old. Pearson product-moment correlation coefficients were computed to assess the relationship between both high-frequency and low-frequency parent copula use and children's growth in low-frequency copula over 6 months. The results yielded a significant, positive correlation between parents' use of low-frequency copula (is, am, are, was, were) and children's use of more lexically unique nouns as sentence subjects. It was concluded that low-frequency copula are especially important in parent input for children's growth in subject-copula combinations.

## Undergraduate Research Symposium Poster Presenter Abstracts

### Criminal Justice

**Name:** Ryan Hunter  
**Major(s):** Pre-Law; Criminal Justice  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Philip Stinson, Health & Human Services  
**Poster #:** 10

#### **Comparative Analysis of Two Alert Crawler-Based Search Services: Google Alerts versus Mention.net**

My presentation outline will include the findings that were discovered during the course of my research project. I will include a brief background of the study currently being conducted by Dr. Stinson, as well as a history of search engines. A portion of my presentation will explain the differences between Google Alerts and Mention.net, the two programs I am comparing. The presentation will distinguish the advantages and disadvantages of both search engines, how both search engines function, and the final data collection created. I will have a PowerPoint presentation prepared as well as a poster board.

**Name:** Raven Ory  
**Major(s):** Criminal Justice  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Philip Stinson, Health & Human Services  
**Poster #:** 11

#### **Intercoder Reliability Assessment of Supplemental Document Coding in a Quantitative Content Analysis Study of Police Crime in the United States**

Dr. Stinson maintains an object-relational research database in OnBase, Bowling Green State University's enterprise-level content management system. An analysis of the intercoder reliability of the supplemental articles indexed in OnBase during the years 2012-2014 was conducted to determine and promote reliability among research assistants. This project is important because reliability is the hallmark of any research database, and because the institutional memory is short with annual turnover of student research assistants working in Stinson's research group. Training recommendations are made from the findings of this study for the purpose of improving the reliability of document coding in the project object database.

### Dietetics

**Name:** Megan Hemmelgarn  
**Major(s):** Dietetics  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Robin Tucker, Public & Allied Health  
**Poster #:** 53

#### **One Month Later: Retention of Nutrition Knowledge After a One-Time Food Demo Intervention**

Nutritional status of college-aged students is of concern because poor diet quality early in life is highly correlated to poor health in later years. Providing engaging and effective nutrition education to this population can be challenging. Food demonstrations (demos) are often incorporated into nutrition programs but have not been evaluated as stand-alone interventions. We sought to evaluate if a one-time food demo intervention about vegetable and dairy consumption was effective in educating and changing the behavior of college-aged females living on campus. Methods: A one-time food demo intervention was presented to female students with behavior and knowledge assessed before, immediately after (post-test), and one-month after the presentation. The intervention included a brief interactive educational session about dairy, vegetables, and their corresponding nutrients (Ca, K, Vit D, fiber). Three "residence hall-friendly" recipes were demonstrated and taste-tested. Results: Knowledge about vegetable and dairy servings increased significantly ( $p < 0.001$ ) between the pre- and post-test. Knowledge of food sources of nutrients increased from the pre- to post-test for all 4 nutrients ( $p < 0.001$ ). Knowledge gains were retained for dairy servings and all nutrients one-month after the food demo ( $p < 0.05$  for all). There was no change in behavior following the intervention. Conclusion: A one-time food demo is effective in increasing knowledge immediately and one-month after intervention and suggest that food demos may be effective in increasing the knowledge retained from nutrition interventions.

## Undergraduate Research Symposium Poster Presenter Abstracts

### Environmental Science

**Name:** Leah Binsack  
**Major(s):** Environmental Science  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Andrew Gregory, School of Earth, Environment, and Society  
**Poster #:** 54

#### **Genetic Diversity of Lesser Prairie-Chickens in a Zone of Sympatry with Greater Prairie-Chickens in Kansas**

In March 2014, the US Fish and Wildlife Service listed the Lesser Prairie-Chicken as threatened under the Endangered Species Act due to increasing human disturbance negatively affecting habitat quality. Change in habitat quality can lead to change in population size, fragmentation and population isolation, which can result in reduced genetic diversity leading to inbreeding depression. Additionally, in central Kansas, Lesser Prairie-Chicken range overlaps with Greater Prairie-Chickens resulting in possible hybridization. We used 10-microsatellite markers to develop a multi-locus genetic profile for 196 individual Lesser Prairie-Chickens from Gove County, KS. Genetic diversity of this population was high ( $H_O=0.78\pm 0.061$ ) and had little indication of inbreeding ( $F_{IS}=0.0065$ ). Genetic clustering analysis with Program Structure determined greatest support for  $K=3$  populations ( $-\ln K=1,231.9\pm 29.8$ ), which was not expected given the likely panmictic nature of this population. We therefore speculate that hybridization is occurring among Greater and Lesser Prairie-Chickens co-habiting this landscape. Further evidence for hybridization is that Hardy Weinberg Equilibrium was only detected among half the loci screened, and that several loci screened spanned  $>100$  base-pair range. In the future, to investigate the rate of hybridization in Gove County, we will be including samples of Greater and Lesser Prairie-chickens collected from outside the zone of sympatry in central Kansas.

**Name:** Stephanie Gowan  
**Major(s):** Environmental Science  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Andrew Gregory, School of Earth, Environment, and Society  
**Poster #:** 55

#### **Assessing the Rate of Genetic Diversity Loss/Gain From Cultivated Seed Bank to Restored Prairie at Oak Openings Reserve**

I will be creating a multi-locus genetic profile of Big Bluestem (*Andropogon gerardii*) from samples collected at two prairie restoration sites within the Oak Openings reserve. I will also have collected samples harvested from the Toledo Metropark cultivar source population from the Oak Opening Native Plant Nursery. I will then compare genetic diversity of samples from the Native Plant Nursery with samples collected at restoration sites to test for a reduction in genetic diversity and test for a genetic bottleneck.

**Name:** Ashlee Nichter  
**Major(s):** Environmental Science  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Ashlee Nichter, School of Earth, Environment, and Society  
**Poster #:** 56  
**Additional Authors:** Tom Lipp, David Haukos

#### **Effects of Anthropogenic Noise on Male Lesser Prairie-Chicken Attendance**

Lesser Prairie-Chickens (*Tympanuchus pallidicinctus*) show avoidance of anthropogenic structures associated with oil and gas development. Oil and gas development constitutes both visual and acoustic disturbance to the landscape. The Lesser Prairie-Chicken was listed as threatened under the Endangered Species Act in March 2014 due to the increasing human disturbance negatively affecting habitat quality. We measured the effect of anthropogenic noise from oil and gas development on Lesser Prairie-Chicken lek attendance and behavioral display during 2015 in Gove County, Kansas. We found that number of males per lek was negatively correlated with anthropogenic noise produced by oil and gas infrastructure at frequencies of 16 Hz, 32 Hz and 64 Hz ( $R^2 = 0.63$ ;  $P = 0.001$ ). After controlling for the number of males attending leks, anthropogenic noise had no influence on the frequency of courtship behaviors (e.g., flutter jumps, fighting, and gobbling). Our results suggest that anthropogenic noise associated with oil and gas development could result in lek abandonment possibly via reduced recruitment to leks located in relatively high noise environments. Therefore, conservation and management efforts for Lesser Prairie-Chickens may need to consider including mitigation of anthropogenic noise.

# Undergraduate Research Symposium Poster Presenter Abstracts

## Geology

**Name:** Thomas Gaetano

**Major(s):** Geology:

Paleobiology

**Institution:** Bowling Green State University

**Faculty Advisor(s):** Margaret Yacobucci, Geology

**Poster #:** 57

### **Anatomical Markers for Heightened Cognitive Ability in Dinosaurs**

Much research has been conducted on brain evolution within Dinosauria. Dinosaurs were originally believed to be incapable of any advanced cognitive abilities beyond the level observed in modern reptiles. This is likely true for many dinosaurs, but recent discoveries suggest that the non-avian maniraptor dinosaurs shared many physical characteristics with their bird descendants, including body feathers and neural adaptations for flight. By studying cranial endocasts (the braincase of fossilized skulls) using computed tomography (CT), paleontologists are beginning to understand the neural changes that took place across the dinosaur-bird transition. Most of these studies are focused on the development of flight, but some modern birds display signs of cognitive behaviors that rival non-human primates. These include, but are not limited to, social cognition and learning, problem solving, and tool use. This study is focused on the variation in endocast shape among 13 species of modern birds across 10 orders. The goal is to establish patterns in the endocast shape associated with the bird's level of social cognition and overall behavioral complexity. The specimens were obtained from a wildlife nursery, representing birds that died during the southern migration in autumn 2015. Their heads were CT scanned at Ohio University in Dr. Larry Witmer's lab, and a statistical method called geometric morphometrics was used to analyze the changes in shape around the forebrain. Qualitative analysis suggests that non-avian maniraptor endocasts resemble the endocasts of water fowl, as opposed to birds of prey or corvids. These patterns may be applicable to non-avian maniraptors.

**Name:** Anthony Martino

**Major(s):** Geology

**Institution:** Bowling Green State University

**Faculty Advisor(s):** Dan Kelley, Fire-Geology

**Poster #:** 58

### **Electron Microprobe Analysis of Kalfstindar Volcano, Iceland**

Iceland sits upon the Mid-Atlantic Ridge and was created by seafloor spreading around 55 Ma. The average thickness of oceanic crust is around 7 km while the crustal thickness of Iceland is anomalously large, around (15-40 km). The increased thickness of crust indicates increased heat activity below Iceland as a result of a mantle plume or convective up-welling. Rock samples were collected in August 2015 from the Kalfstindar Volcano. The samples were then cut, polished, and prepared into thin sections for analysis. Electron Microprobe Analysis has been conducted on ten samples to determine the pressure of ol-plag-cpx crystallization through glass composition. Calculated pressures range from 4.7-8.1 kBar revealing a resultant magma chamber depth of 16-28 km. Additional microprobe and XRF data collected for Kalfstindar agree with the collected samples. There is good correlation to geophysical estimates of the Moho depth indicating that magma pools at the crust-mantle boundary. Chambers at intermediate depths (16-20 km) correspond to higher stratigraphic ash deposits, therein lies evidence for discrete magma chambers at shallower due to change in buoyancy as a result of eruption on the surface. The results suggest a large magma body at a depth of 24-28 km with possible chambers at intermediate depth. Multiple chambers would suggest that the magma's evolution below Kalfstindar is complex and is subject to assimilation and magma mixing. To increase accuracy of results, further samples should be collected and analyzed to produce a more robust data set.

## Undergraduate Research Symposium Poster Presenter Abstracts

### Geology Cont.

**Name:** Matthew Witte

**Major(s):** Geology

**Institution:** Bowling Green State University

**Faculty Advisor(s):** Dr.

Margaret Yacobucci, Geology

**Poster #:** 59

### **Morphometric Analysis of the Trilobite *Eldredgeops Rana* To Assess Geographic Patterns of Variation in the Michigan and Appalachian Basins During the Middle Devonian Period**

By investigating morphometric variation of the Middle Devonian trilobite *Eldredgeops rana* from the Great Lakes region, we can better understand the geographic distribution of genetic populations across the Appalachian and Michigan Basins. Following on a previous study, we have expanded our database to include over 700 specimens of *E. rana* from New York, Ohio, Michigan, Wisconsin, Indiana, Iowa, and Ontario. Measurements of cephalon length and width were used to determine growth trajectories of trilobite populations from the ancient basins. A subset of 350 specimens were used for geometric morphometrics, using 26 landmarks on the cephalon. Principal components analysis (PCA) and canonical variate analysis (CVA) were used to identify patterns of morphological variation among sampling locations. Morphometric data suggests that there is a degree of divergence between *Eldredgeops* from the Michigan versus Appalachian Basins. Samples from New York, taken from a range of sampling localities and museum collections, show an exaggerated asymmetry to the right side of the cephalon that is not seen elsewhere. An unexpectedly strong north/south geographic divide was also observed in the CVA, with a weaker signal in the PCA. Overall morphometric patterns suggest some separation of trilobite populations from the Michigan and Appalachian Basins, but with at least two shallow marine connections, one across northern Ohio and one across Ontario and northern Michigan, present during the Middle Devonian.

### History

**Name:** Dominique Seo

**Major(s):** History

**Institution:** Bowling Green State University

**Faculty Advisor(s):** Dr. Vibha Bhalla, Ethnic Studies

**Poster #:** 12

### **The Regal Theater: The Forefront of Racial Desegregation**

My project focuses on an important historical era of within the United States. After the 1919 racial riots, Chicago became one of the most segregated American cities. The Blacks were forced to be housed in the Bronzeville neighborhood where the first successful Black businesses. One thing that untied the races was music, especially Jazz. The primary question that will be addressed is, "How did the Regal Theater and Jazz effect racial desegregation in Chicago's Bronzeville neighborhood?" During this time period, the cultural and economic hub of Chicago's Black community was on 47th Street, in the heart of Bronzeville. The anchor of the 47th Street business district was the Regal Theater. It was a good place for Whites and Blacks to put aside their differences and just enjoy the music. In the beginning, the main music that was performed was Jazz. Over the years, musical tastes changed, as did the genre at the Regal. As Chicago became desegregated, Blacks were able to live, shop, and work in many more locations throughout the city and suburbs. Because of those changes, Bronzeville and the Regal deteriorated. After a period of successful growth, the businesses along 47th Street, as well as the Regal Theater, declined as the city became more integrated. I find this to be an interesting and important topic that people will find interesting because of the role of music, especially Jazz, in the eventual desegregation of Chicago, and the rest of the United States.

**Name:** Matthew Wright

**Major(s):** History

**Institution:** Bowling Green State University

**Faculty Advisor(s):** Amilcar Challu, History

**Poster #:** 13

### **Analysis of Afro-Mexican Soldiers: From the Late Eighteenth to Early Nineteenth Century**

The group of soldiers that I am focusing on to see how darkness of their skin affected their military enlistment and careers is Afro-Mexicans. Afro-Mexicans were people who have ancestry from Africa either fully or partially, and were living in Mexico. In colonial New Spain (Mexico before independence) Afro-Mexican soldiers were grouped by racial titles based on the where they fell in the racial hierarchy system the Spanish implemented. Even though these racial titles disappeared after Mexican independence the darkness of a soldier's skin was still recorded. Many of the Afro-Mexican soldiers during Spain's colonial rule in the Mexican military were Mulato (biracial), which meant one of their parents were of Spanish ancestry. Pardos were people with mixed African and Spanish blood, having lighter complexions, while Morenos were mixed African and Spanish blood with dark complexions, both were considered Mulato. Afro-Mexicans Pardos were discriminated against like many Afro-Mexicans but also experienced advantages compared to Afro-Mexicans with darker skin complexions. Each city in New Spain had a different way of treating Pardos and Morenos. In some cases this was dependent on the

## Undergraduate Research Symposium Poster Presenter Abstracts

necessity of Afro-Mexicans to fill the ranks.

### Inclusive Early Childhood Education

**Name:** Alison Bixler  
**Major(s):** Inclusive Early Childhood Education  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Alicia Mrachko, Intervention Services  
**Poster #:** 14

#### **Family-Friendly Science: Increasing Parent and Family Engagement in STEM Education at the Early Childhood Level**

This is a summary of scholarly research completed in the areas of early childhood STEM education, early childhood STEM activities, and early childhood parent and family engagement strategies. It was conducted to satisfy the questions "1. How can early childhood teachers effectively engage parents and families in the education of their children?" and "2. Specifically, how can early childhood teachers effectively engage parents and families in science education?" Parent and family engagement is crucial to the success of a student in STEM subjects; this supports the necessity for research in this subject area. The conclusions of the research were: 1) parent and family involvement is essential to student achievement, 2) parent and family involvement is essential to student achievement in STEM, 3) carrying out activities and demonstrations at home is essential to scientific literacy, and 4) empowering parents and families to be active contributors to their child's science education leads to increased scientific literacy. These conclusions will serve as the basis for field research to be conducted in Fall 2016.

**Name:** Stephanie Wonnell  
**Major(s):** Inclusive Early Childhood Education  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Mariana Mereoiu, School of Intervention Services  
**Poster #:** 15

#### **Transgender Children: Who Are They and How Can We Help Them**

In my presentation I explain what transgender means and what all the different categories under the transgender umbrella means. I also have information about the struggles transgender students face in school and their lives. I explain how teacher can inform families and the community, if the family believes this is the best choice for their child. I also include information on how all people can be allies to the transgender community. The poster I have uses the beautiful artwork of Sophie LaBelle, the artist behind Assigned Male and speaker who travels the world to explain trans issues.

### Music

**Name:** Lydia Dempsey  
**Major(s):** Music  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Marilyn Shrude, MUCT  
**Poster #:** 16

#### **The Wishing Well: A Children's Ballet (Composer's Perspective)**

As a composer, I am passionate about introducing audiences to contemporary classical music. I chose to compose a twenty-five-minute children's ballet titled "The Wishing Well" based on the fairytale "Diamonds and Toads". It premiered on April 2, 2016 at the Bowling Green Performing Arts Center in collaboration with choreographer Sophia Schmitz and conductor Robert Ragoonanan. Other elements of the project included set design, costuming, lighting, audio and video recording, and marketing. The mission was to provide the local community with a free arts event, introduce young audiences to music and ballet, enrich people's lives through music and dance, provide young ballerinas with the opportunity to perform a ballet, and expand the repertoire of contemporary ballet.

Attendance at the event was high due to marketing efforts and the number of people who contributed to the project. The performance hall, seating 750 people, was over halfway full. Throughout the process, I discovered that children are receptive to new sounds and experiences. In fact, they were more engaged because the project was unique.

Although dance collaboration is becoming more prevalent in the contemporary music scene and many important 20th century compositions are ballets, few Bowling Green State University composers have worked in the genre. In fact, no other composer has written a ballet during her time at the university. I believe that ballet is a captivating genre that will draw new audiences to contemporary music, and I hope "The Wishing Well" is a stepping-stone to further dance collaborations in the Bowling Green community.



## Undergraduate Research Symposium Poster Presenter Abstracts

### Music Cont.

**Name:** Sophia Schmitz  
**Major(s):** Violin Performance  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Kirk Kern, Center for Entrepreneurial Leadership  
**Poster #:** 17

### The Wishing Well: A Choreographer's Perspective

In completing the requirements for the BGSU Honors College Honors Project, I am collaborating with composer, Lydia Dempsey. Dempsey is composing the music for a twenty-minute children's ballet which we have entitled, The Wishing Well. My main roles in this project include choreographing and rehearsing the dance steps as well as marketing the production and sewing the costumes. This project is interdisciplinary for me as it combines my business knowledge, that I have gained through the entrepreneurship program, with my education in contemporary music from the College of Music. In addition, it will draw from my experience and training in dance and sewing which I acquired prior to college. My Mentor's experience in business and marketing will be of great help to me as he guides me in marketing the ballet.

### Neuroscience

**Name:** Gregory Grecco  
**Major(s):** Neuroscience  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** N/A  
**Poster #:** 81  
**Additional Authors:** Jon E. Sprague

### Impact of Functional Group Modifications on Designer Phenethylamine Induced Hyperthermia

The popularity of designer phenethylamines such as synthetic cathinones ("bath salts") has led to increased reports of life-threatening hyperthermia. The diversity of chemical modifications has resulted in the toxicological profile of most synthetic cathinones being mostly uncharacterized. Here, we investigated the thermogenic effects of six recently identified designer phenethylamines (4-methylmethamphetamine, methylone, mephedrone, butylone, pentylone, and MDPV) and compared these effects to the established thermogenic agent 3,4-methylenedioxymethamphetamine (MDMA). Specifically, we determined the impact of a  $\beta$ -ketone,  $\alpha$ -alkyl, or pyrrolidine functional group on core-body temperature changes. Sprague-Dawley rats ( $n=5-6$ ) were administered a dose (30 mg/kg, sc) of a designer phenethylamine or MDMA, and core body temperature measurements were recorded at 30 minute intervals for 150 minutes post treatment. MDMA elicited the greatest maximum temperature change ( $\Delta T_{max}$ ), and this effect was significantly greater than its  $\beta$ -ketone analog, methylone. Temperature area under the curves (TAUCs) and  $\Delta T_{max}$  were also significantly different between 4-methylmethamphetamine (4-MMA) and its  $\beta$ -ketone analog mephedrone. Lengthening the  $\alpha$ -alkyl chain of methylone to produce butylone and pentylone significantly attenuated the thermogenic response on both TAUCs and  $\Delta T_{max}$  compared to methylone; however, butylone and pentylone were not different from each other. Pyrrolidine substitution on the N-terminus of pentylone produces 3,4-methylenedioxypyrovalerone (MDPV), which did not significantly alter core body temperature. Thermogenic comparisons of MDMA vs methylone and 4-MMA vs mephedrone indicate that oxidation at the benzylic position significantly attenuates the hyperthermic response. Furthermore, either extending the  $\alpha$ -alkyl chain to ethyl and propyl (butylone and pentylone, respectively) or extending the  $\alpha$ -alkyl chain and adding a pyrrolidine on the N-terminus (MDPV) significantly blunted the thermogenic effects of methylone. Overall, the present study provides the first structure-activity relationship in-vivo toxicological analysis of designer phenethylamines.

## Undergraduate Research Symposium Poster Presenter Abstracts

### Neuroscience Cont.

**Name:** Kylee Smith  
**Major(s):** Neuroscience  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Casey Cromwell, Psychology  
**Poster #:** 60  
**Additional Authors:** Zackery Todd Knauss

#### **Reward Preference, Discrimination and Relative Valuation Base On Effort**

A free choice study was conducted to look at reward preference, discrimination and relative valuation based on effort. A three box paradigm was used to give the element of free choice between two different chambers, one containing 1 press 1 pellet and the other containing 5 press 1 pellet. Each week the amount of pellets dispensed in the 5 press chamber increases or decreases by an increment of one. Within each of those weeks a different task is performed each day. Monday and Tuesday rats were put in the middle decision box and allowed to choose its first chamber. They were shut in there for 10 minutes where they then were released and allowed to explore the other chamber. Wednesday and Thursday were open days. They were put in the middle decision box and allowed to freely roamed between the two chambers for 20 minutes. Friday was an extinction day each week in which it was still an open free choice day, but no reward is received. We expect a preference for the 1 press 1 pellet, but as the amount of reward increases in the 5 press chamber, then the preference will begin to become more even. We will compare how elements of choice including discrimination, preference and relative valuation differ when animals are in a free 'foraging' choice compared to the more standard 'forced' choice test used in comparative psychology.

**Name:** Samuel Woodburn  
**Major(s):** Neuroscience  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Arthur Brecher, Chemistry  
**Poster #:** 61  
**Additional Authors:** Adam J. Ellington

#### **Interactions of Acidic Glycosaminoglycans with Basic Proteins and Peptides**

Heparin, the common sulfated glycosaminoglycan, has been in long-time clinical use as an anticoagulant prior to surgical procedures. Subsequent to surgery, it is neutralized by administration of the basic, low molecular weight polypeptide, protamine. In past years, it has been reported that protamine itself exhibits a small anticoagulant effect when tested with a prothrombin time (PT) assay. In the current study, this laboratory reports that pharmacological levels of protamine display considerable anticoagulant effects in PT assays and that the anticoagulant effect is readily neutralized by Dermatan Sulfate (DS). Whereas 2, 4, 8, 20, and 40  $\mu\text{g}$  protamine generate PTs of 14.5, 16.6, 19.7, 23.8, and 30.4 seconds relative to a control of 10.1 seconds, addition of 90  $\mu\text{g}$  DS to plasma/protamine mixtures reduces PT to 13.2, 13.0, 13.6, 14.0, and 14.5 seconds, respectively. The secondary control for 90  $\mu\text{g}$  DS was only 13.6 seconds. Furthermore, the basic protein, calf thymus histone, displays a slight neutralization of heparin when added sequentially to plasma. Relative to PTs of 12.6, 24.9, 37.2, 49.1, and 53 seconds for addition of 2, 4, 6, 8, and 10  $\mu\text{g}$  heparin to plasma, the corresponding values are 11.3, 17.5, 31.1, 42.6, and 51.3 seconds with the further sequential addition of 2  $\mu\text{g}$  of calf thymus histone. Histone alone prolongs plasma by 2.5 seconds, from 11.2 to 12.8 seconds. More profound neutralizing results are obtained with 5  $\mu\text{g}$  histone. Hence, the characteristic reaction of the basic proteins and peptides in their common phenomenon in nature than heretofore perceived.

**Name:** Luke Zona  
**Major(s):** Neuroscience  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Howard Casey Cromwell, Psychology  
**Poster #:** 62  
**Additional Authors:** Ben Fry, Jacob Lalonde

#### **Psychopharmacology of Choice: Anandamide's Effect on Appetitive and Consummatory Behavior in the Rat Model**

A natural compound called anandamide was under investigation in this study. Its psychopharmacological effects in mammals is similar to THC, the main active compound in Marijuana. Anandamide is made naturally within the mammalian brain and it affects various behaviors including feeding behavior. We investigated anandamide's effect on work effort to receive different levels of rewarding food as well as its effect on consummatory behavior. We expected low doses of this substance similar to natural levels to increase the value of food reward and lead to greater effort used in order to obtain food. The results advance knowledge in terms of the understanding how endocannabinoids impact behavior and psychology. Anandamide is a potential medication and related drugs are already used for medical purposes. Further understanding for how these compounds work and how the underlying natural processes that are related to these chemicals operate will lead to more effective uses and grant insight into disorders resulting from endocannabinoid deficiency or over expression.

## Undergraduate Research Symposium Poster Presenter Abstracts

### Philosophy

**Name:** Adam Lewton  
**Major(s):** Philosophy  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Phillip Peek, Classical Studies  
**Poster #:** 63

#### Learning Elementary Greek

I will be presenting my work on a textbook built for students who wish to learn the basics of the Ancient Greek language. I will be going over how the language works, and how I had to organize the information to be as easily learned as possible.

### Physics

**Name:** Anthony Colosimo  
**Major(s):** Physics  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Anthony Colosimo, Physics & Astronomy  
**Poster #:** 64  
**Additional Authors:** Jianfeng Ji, P. S. Stepanov, L. A. Boatner and F. A. Selim

#### Scintillation Mechanisms in Wide and Direct Band Gap Oxides

Direct and wide band gap materials, due to their ideal and tunable electronic properties, have a wide variety of applications in optoelectronic devices. Two materials have been the focus of this research: Zinc oxide (ZnO) is a vastly studied wide gap semiconductor with many white lighting and device applications. The other, yttrium aluminum oxide (YAG), is a wide gap insulator that when doped with rare earth metals, exhibits intense phosphorescence. In this study, the properties governing the scintillation mechanisms in undoped single crystal zinc oxide and doped and undoped yttrium aluminum oxide are probed and analyzed.

**Name:** Adam Lahey  
**Major(s):** Physics  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Mikhail Zamkov, Physics & Astronomy  
**Poster #:** 65

#### Atomic Layer Deposition (ALD) of Quantum Dots: Monolayer Growth of Nanocrystals at Room Temperature

Quantum dots are semiconducting particles a few atoms in diameter which confine the electrons in a such a way that their size can determine the wavelength of florescence. Atomic Layer Deposition (ALD) onto a slide and then growing the quantum dot to a particular size would lower production costs for industrial manufacture of semiconducting nano-materials.

**Name:** Joseph Leffler II  
**Major(s):** Physics  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Joseph Leffler II, Physics & Astronomy  
**Poster #:** 66

#### Thermal Annealing of PbS Nanosheets

Nanomaterials have been a growing industry for applications in the medical sciences, for uses in LED lights, lasers and most commonly for their possibilities in solar energy. Lead Sulfide(PbS) nanosheets have been of interests for their ability to transfer energy without have the "hopping" seen in quantum dots. Unfortunately the synthesis of these nanosheets is not perfect and they can get bumps, divots and cracks lowering their efficiency. To counter this we put the nanosheets through a process called annealing which involves heating the sheets to a set temperature under specific conditions and then slowly lowering the temperature back to room temperature. In the annealings we performed we saw a slight blue shift if the photoluminescence (PL) as well as a nearly doubling of the PL amplitude and quantum yield. These are promising results and prompt us to look at using different temperatures and timings to get the best annealing results possible.

**Name:** Lindsay Lesh  
**Major(s):** Physics  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Eric Mandell, Physics & Astronomy  
**Poster #:** 67  
**Additional Authors:** Alexey Zayak

#### Carbon MD Simulations and Comparison to Graphitic Stardust

The objective of this research is to simulate the quenching (rapid-cooling) of carbon droplets of various sizes with various quench times for comparison with graphitic stardust found in primitive meteorites. The meteoritic carbon formations of interest exhibit a core-rim structure, where the core - with a density less than that of the graphitic rim - comprises the majority of the grain. There is reason to hypothesize that the cores of these grains are the result of the rapid freezing (quenching) of a liquid carbon droplet. Since the liquid phase of carbon is extremely difficult to investigate in laboratory conditions due in part to its high melting point, molecular dynamic simulations are an attractive method for examining the behavior of carbon as it is rapidly cooled from a gaseous state. The resulting condensates from these simulations have been analyzed using radial distribution function (RDF) calculations and debye scattering calculations to simulate electron diffraction data.

# Undergraduate Research Symposium Poster Presenter Abstracts

## Political Science

**Name:** Nathan Burkholder  
**Major(s):** Political Science  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Melissa Miller, Political Science  
**Poster #:** 68

### **Media Coverage in Relation to Retrospective Voting: Using Obama's Overall Article Tone to Predict Clinton's Overall Article Tone**

This research looks into retrospective voting and its relationship with the 2016 presidential race media coverage provided by the New York Times. Retrospective voting is the basic idea that voters will either "punish" or "reward" candidates based on the candidate's effectiveness in office. Based off the idea of retrospective voting, the media coverage of Barrack Obama in the 2016 presidential race may also face retrospective evaluations. As a class, we coded several hundred articles published in the New York Times that were related to the 2016 presidential race. From these coded articles, this research looks into Barrack Obama's overall tone in the articles that he is mentioned, as well as Hillary Clinton's overall article tone, headline tone and positive (negative) personal traits. The purpose of this research is to see if the overall tone of articles that mention Barrack Obama can predict the overall article tone of Hillary Clinton in the same article.

**Name:** Leslie Potts  
**Major(s):** Political Science  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Leslie Potts, Ethnic Studies  
**Poster #:** 69

### **#BlackSpacesExist: An Analysis of the Virtual Culture of Activism on Black Twitter**

My research #BlackSpacesExist: An Analysis of the Virtual Culture of Activism on Black Twitter is an analysis of both tweets and perceptions of those who interact with the virtual community of black twitter. The goal of this research is to gain a better understanding of the affect of dialogue in relation to black activism over the virtual sphere of black twitter affects the identity development of its' participants. Research shows that Black Identified twitter users- a large section of the platforms user demographic- reinforce their social identity and self-concept through engagement with the virtual community Black Twitter. Through tweeting with hashtag identifiers, users bring attention and encourage solidarity toward topics related to their identity. #blacklivesmatter in particular allows users to disseminate information and demand visibility in a virtual space. Through surveys and platform interaction of users within the platform, I believe that we can better understand the importance hashtags in the activism of black youth.

## Psychology

**Name:** Samantha Awada  
**Major(s):** Psychology  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Carolyn Tompsett, Psychology  
**Poster #:** 70

### **The relationship between therapist barriers to parent engagement and therapist parent engagement efficacy: The moderating role of demographic variables**

The ability to engage parents is a crucial tool for child and family therapists; specifically, improvements in children's behaviors are observed when their parents are adequately engaged and emotionally present during the therapy process (Nix, Bierman, & McMahon, 2009). Despite the importance of parent engagement, therapists regularly experience internal and external barriers to effective parent engagement. In a national study of 142 child and family therapists, we examined the relationship between internal therapist barriers to parent engagement and therapist parent engagement efficacy, and examined various demographic variables (years of experience, therapist credentials, therapist parental status, and use of evidence-based treatments) that might moderate this relationship. Greater self-reported barriers to engaging parents was associated with lower parent engagement efficacy. This association was not significantly moderated by therapist years of experience, therapist credentials, therapist parental status, or therapist use of evidence-based treatments. However, a number of therapist characteristics were associated with their levels of barriers to parent engagement and parent engagement efficacy. Therapists reported less barriers to engaging parents when they had children themselves and when they had more years of experience. Therapists had greater parent engagement efficacy when they were parents and when they had more years of experience. These results could be important when creating trainings for child and family therapists to enhance their parent engagement efficacy and decrease the amount of barriers they experience, which would likely increase parent engagement within child and family therapy.

## Undergraduate Research Symposium Poster Presenter Abstracts

### Psychology Cont.

**Name:** Alexandria Hudeck

**Major(s):** Psychology

**Institution:** Bowling Green State University

**Faculty Advisor(s):** Sherona Garrett-Ruffin, Psychology

**Poster #:** 71

### **The Effects of Mindfulness Meditation on EEG Asymmetry**

This study looks at the effects of mindfulness meditation on electroencephalogram (EEG) asymmetry. The study will be looking at the shift in brain wave patterns between the right and left hemispheres. I hypothesize that mindfulness meditation will have a significant decrease on negative emotions through an increased lateral shift of alpha band wavelengths to the left hemisphere.

**Name:** Alexandra Schmidt

**Major(s):** Psychology

**Institution:** Bowling Green State University

**Faculty Advisor(s):** Howard Casey Cromwell, Psychology

**Poster #:** 72

### **Incentive Contrast as a Relative Reward Process: Using sucrose solutions in a single session to test rapid reward comparisons in rats**

This study examines the relationship between rapid relative reward comparisons and incentive contrast among rats (n=5). Animals were trained to lever-press in order to obtain access to a sucrose solution (concentration used: 1%, 10% or 20% in tap water). These rewards were placed outside an operant box which could be reached through a small hole displaying sessions with mixed comparisons (1v20%, 20v1%) or single sessions (1v1%, 10v10%, 20v20%) that rotated between two spouts containing the pre-randomized order of paired blocks; allowing for comparative analysis between two spouts/concentrations and blocks of responses. Throughout weekly testing each animal experienced a value upshift (positive) or downshifts (negative) relative to another outcome as we examined the incentive contrast effects on behavioral performance. We examined the influence of dynamic comparisons between the two reward outcomes in a repeated measures design with three sessions: a single outcome and a mixed outcome followed by a single outcome session the next day for extinction. Results signified rats experienced negative contrast and scaled their behavioral responses in decreased motivated action to obtain the incentive reward. Positive induction, however, was not obtained and proposes further research and analysis to understand the comparative values and to determine when motivational systems are registered to initiate behavior in animal paradigms. The future direction of this novel design and research area could be essential for investigating interactions between external and internal factors of motivation and reward processing as learning continues to play a role in conditioning and predictive contrast.

**Name:** La-Shawna Stegall

**Major(s):** Psychology

**Institution:** Bowling Green State University

**Faculty Advisor(s):** Raymond Schuck, Communications

**Poster #:** 73

### **Get Hard: A Contemporary Depiction of Buddy Films and a New Perspective on Race in the United States**

This paper will explore the evolution of buddy films by comparing themes and portrayals of characters to those in Get Hard. This film opened the door to a higher understanding and appreciation for the differences that exist between blacks and whites in the United States. Get Hard is our modern day buddy film by means of the basic criteria: camaraderie begins after overcoming a series of obstacles as a team, despite tension that exists between the two individuals. As a reflection of 2015, it portrays the newly established levels of tolerance that have been implemented within our culture. However, this film doesn't have a shortage of racially charged themes, though it does capitalize on the equally disruptive behaviors that can exist within each culture without spending too much time dwelling on one race. One can argue environmental influences have helped shape and isolate distinct traits and characteristics within each culture and from there, we can then see it's more than just biologically based pigmentation that defines race. This paper finally discusses how Get Hard paves the way for a better understanding of cultural differences and if pushed, the eventual eradication of stereotypes by comparing the changes we have seen portrayed buddy films, higher tolerance levels, and better understandings of environmental influences.

## Undergraduate Research Symposium Poster Presenter Abstracts

### Public and Allied Health

**Name:** Emily Gill

**Major(s):** Public and Allied Health

**Institution:** Bowling Green State University

**Faculty Advisor(s):** Mary-Jon Ludy, Public & Allied Health

**Poster #:** 74

**Additional Authors:**

Madeliene Drees, Taylor Lechner, Carrie Hamady, Mary-Jon Ludy

### Prevalence of Muscle Dysmorphia and Disordered Eating in College Students by Predominant Exercise Type

T.E. Lechner, BS, RDN; M.J. Drees; E.M. Gill; C.M. Hamady, MS, RD, LD; M.J. Ludy, PhD, RDN, FAND; Bowling Green State University, Department of Public and Allied Health, Bowling Green, Ohio  
Background: Many young adults experience distorted body image and decreased body satisfaction. To attain more “ideal” bodies, negative alterations in eating and/or exercise habits are common. This study’s objective was to compare muscle dysmorphia and disordered eating in undergraduates who participate in aerobic-, anaerobic-, or flexibility-predominant exercise; mixed exercise, or no exercise.

Methods: Male (n=47) and female (n=62) undergraduates (age 21.2±4.8; BMI 25.0±4.6 kg/m<sup>2</sup>) were recruited from the student union and recreation center. The Eating Attitudes Test (EAT-26), Muscle Dysmorphic Disorder Inventory (MDDI), and demographic/exercise questions were administered via iPad. Exercisers reported <sup>3</sup>150 minutes/week of purposeful exercise. Predominant exercise type was defined as <sup>3</sup>50% reported minutes from one type. Between-sex differences were assessed by t-tests, while exercise type differences were assessed using analysis of variance.

Results: Muscle dysmorphia was exhibited in 7.1% of undergraduates. Males had higher MDDI total and drive for size subscale scores, while females scored higher on drive for appearance (p<0.05 for all). Aerobic- and anaerobic-predominant had higher MDDI total and functional impairment subscale scores than non-exercisers (p<0.05). Disordered eating was exhibited in 25.9% of undergraduates. Females had higher EAT-26 total and diet control subscale scores (p<0.05 for both). EAT-26 total score and diet control and bulimia subscales were higher in aerobic-predominant compared to anaerobic-predominant exercisers (p<0.05 for all).

Conclusions: Non-exercisers were largely unaffected by muscle dysmorphia and disordered eating. Males exhibited more symptoms of muscle dysmorphia, while females and aerobic-predominant exercisers exhibited more symptoms of disordered eating; university campuses should consider targeted education for these groups.

### School of Art – Fine Art

**Name:** Alyssa Wells

**Major(s):** 2D Fine Art

**Institution:** Bowling Green State University

**Faculty Advisor(s):** Gordon Ricketts, School of Art

**Poster #:** 18

### Borderline Mexican: An Art Series on Bicultural Identity

I am Mexican American. Mexican on my mother's side and as caucasian as it gets on my father's side. Although my brother and I are of mixed cultural backgrounds, we continually feel the dissonance between us and both cultures. Never being “American” enough and not being a full blooded Mexican, we are put in the limbo of both worlds. Currently I am making a series of artwork that pertains to the personal and social conflicts of coming from two different cultural backgrounds. With different mediums, such as oil paint, collage, lithography, and screen printing, I explore what it means to identify as a Mexican American.

My artwork visually displays the conflict of cultural identification with skin tone as well as the un-ease of not belonging specifically to one group or the other. One piece I am currently working on calls into question the authenticity of calling oneself Mexican in the form of flour and corn tortillas, I show how I can be both and neither at the same time. Not only do I portray the struggle of being from two different backgrounds, but I also tackle the conflicting feelings of white privilege due to my light skin tone. Recent presidential candidates have amplified the consistent hatred towards Mexicans, which has also influenced my decision to make this series of work. This series of artwork sheds a light on being in between a rock and a hard place within the cultures, but through these pieces I hope to find a comfortable middle ground for myself and others who find themselves in this position.

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### School of Art – Glass

**Name:** Jacqueline Polofka  
**Major(s):** 3D studies  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Joel O'Dorisio, Glass  
**Poster #:** 19

#### Reactive Glass Color Experimentation

Glass is a very time consuming, expensive, and difficult material to work with. Through this grant, I was able to gain valuable knowledge and experience using reactive glass color. Glass is made by melting elements such as silica, lime, and soda together at very high temperatures. In order to create colored glass even more elements are necessary, creating complex chemical compositions. Some of which become “reactive,” meaning when two or more reactive colors are used together they create a chemical reaction on the surface of the glass. These reactions are very hard to predict and control. For example, by changing the temperature at which you heat or cool the glass the final result of two pieces made with the same colors may change the reactions/final result to look quite different on each. Throughout my research, I have been able to develop an understanding of how to work with and treat reactive glass color, as well as start a personal library of successful color combinations that I can use in my own work, and share with others.

**Name:** Lauren Rusch  
**Major(s):** Glass  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Alli Hoag, Glass  
**Poster #:** 20

#### Traditional Coldworking Techniques in Glass

Coldworking can be defined as the manipulation or alteration of “cold” glass without the use of heat; it is critical to producing a finished piece of hand-blown or cast glass. Once a piece of glass has been blown in temperatures exceeding 2,000 degrees, it is gradually brought back down to room temperature through an annealing process—and it can then be considered cold glass. At this point, any blemishes on the glass can be fixed by grinding or sanding the glass through various methods. However, when grinding glass, the surface of the glass is actually being scratched, resulting in a frost-like appearance. In order to get rid of the scratches, there are several steps that need to be taken in order to restore the clear polish of the glass. This research project will explore the methods in which glass can be coldworked by hand. Today, most methods of coldworking involve some sort of machinery, although coldworking glass by hand has several advantages. As an artist, doing things by hand makes the finished work more personal and gives the artist more control over the quality of work. Therefore, this research project will discover and develop the best method of coldworking, as well as compare the quality between glass that has been coldworked with machinery and by hand.

### Social Work

**Name:** Faith Joyce  
**Major(s):** Social Work  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Hee Soon Lee, Health & Human Services  
**Poster #:** 21  
**Additional Authors:** Chelsi McElrath, Stephanie Duncan, Jennifer Lang

#### Homelessness and the Effects on Families and Children

Homelessness is a major issue that happens all across the world affecting millions of people. This issue has been around in the U.S. since 1640. The target groups being studied are families and children, which is one of the largest growing populations that are usually overlooked. They're disregarded because we can't tell who is homeless just by looking at them. When it comes to helping the homeless, there is a negative connotation because people think homelessness is a choice. According to President Obama's 2016 Budget, more money is being set aside to end homelessness among families and children to end it completely. The purpose of the study is to examine why it is so hard for people to get out of it and to discover what strategies are possible to eliminate the issue. The method of study is heavily based on the literature review that looks further into the issue and it raises more awareness about how serious homelessness actually is. Findings showed that if we continue to put more money into programs that help the homeless together we can put an end to homelessness. In addition, to eradicate it, homelessness community organizations and government programs need to work together to help the target population find adequate housing, food assistance, and pay their bills until they can get back on their feet. We suggest that social workers should become more conscious about the issue, find the appropriate resources needed for a client, and advocate for them.

## Undergraduate Research Symposium Poster Presenter Abstracts

### Social Work Cont.

**Name:** Alana Marsh  
**Major(s):** Social Work  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Mamta Ojha, Social Work  
**Poster #:** 22

#### **Exploring the Unique Needs and Experiences of Biological Children in a Foster Family**

When social workers enter the home of a foster family, they typically must complete an assessment of the family dynamic and the wellbeing of the foster child in the home. In completing this task, the biological child(ren) within the home may be unintentionally disregarded by the worker whose primary focus is the foster child. The purpose of the following research was to identify the experiences and needs of biological children in a foster family. An online survey was sent to licensed foster families from a private agency. Analysis of 21 survey answers and thorough review of literature revealed a significant lack of available resources for foster parents to utilize when preparing their biological children for this family change. It was also revealed that children held damaging misconceptions about foster care previous to foster children entering the home. The following survey results present an analysis of the experiences, both positive and negative, of biological children before foster youth enter the home, during their stay, and after they exit the home. Survey results mirror various findings from research and have strong implications for agency and social work practice. The research prompted the creation of a curriculum for children before the family becomes licensed to foster. The exploratory research is not generalizable but concludes that future research should explore the needs of biological children in more depth. Future research and policy should also work to establish new placement procedures, family assessment criteria, and pre training classes for both foster parents and their children.

**Name:** Haley Perkins  
**Major(s):** Social Work  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Hee Lee, Social Work  
**Poster #:** 23  
**Additional Authors:** Samantha Troiano, Alyssa Millsaps, Astasha Perrine, Adina Rhoads

#### **The Effects of Autism on Transitioning from Adolescence into Adulthood**

Autism Spectrum Disorder (ASD) has become a growing topic of interest over the years and has gained a lot of attention within the media. However, when we hear about ASD in the media and the research that is currently being conducted, it is typically focused around children. This has sparked our interest to look beyond the childhood years and study how ASD effects the transitional period between adolescence and adulthood. This study holds a lot of significance because currently there is not enough research about ASD during this transitional period. One of the main objectives of this study is to understand their needs so that they can be placed into the appropriate programs to help better their lives during this transitional period. This study is meant to raise awareness about the lack of research on this issue and help the parents of children with ASD better understand this transitional period as well. The primary method that will be used during this study is through the distribution of surveys. We will also be utilizing previous research on this topic to conduct our study.

**Name:** Margaret Scott  
**Major(s):** Social Work  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Hee Soon Lee, Health & Human Services  
**Poster #:** 25  
**Additional Authors:** Meghan Bishop

#### **The Crisis in Crisis Intervention: An Analysis of Crisis Care and Community Mental Health in Northwest Ohio**

The issue with inpatient and crisis intervention centers is the lack of individualized and client centered services, speed of service, and appropriate aftercare referrals. This study explores the benefits of collaboration between community mental health, crisis intervention, and inpatient services. Social workers should evaluate all aspects that effect the individual accessing the mental health system. Factors such as social economic status, and community resources should be considered. The most effective way to improve the mental health system is a holistic view of the community and its residents and their unique needs. Additionally as practitioners, it is very important to be aware of insurance benefits and how to empower our clients to use their insurance to the fullest. The objective of this study is to identify what programs can be implemented through collaboration to more effectively care for patients. By observing and surveying local crisis intervention workers in Northwest Ohio, we identified the crucial needs of these particular mental health systems. These needs included follow up services, community partnerships, more stringent staffing requirements, improved individual care plans, and sharing data and care plans with collaborative agencies. This holistic view of crisis intervention would aid in improving this collaboration between inpatient care and follow up treatment. This would ensure a smoother transition from crisis care to inpatient care or therapy. Findings suggest that



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social workers should work for raising standards of care in crisis intervention and advocating for effective crisis intervention.

### Sociology

**Name:** Mallory Farabaugh  
**Major(s):** Gerontology  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Monica Longmore, Sociology  
**Poster #:** 75

#### Racial/Ethnic Diversity, Condom Use, Sexual Concurrency, And HIV Testing Among College Students

The college years are often a time of exploration. As such, many college students engage in risky sexual behaviors that increase their risk for heterosexually transmitted sexual infections, including HIV. Few studies, however, have compared sexual risk taking and HIV testing among a racially diverse sample of college students. The social psychological perspective underlying this study is symbolic interactionist theory, which emphasizes that social determinants including demographic characteristics and individuals' choices are associated. In this study, we examined college students (n = 1,316) who participated in the Toledo Adolescent Relationships Study, collected by Dr. Giordano, Dr. Longmore, and Dr. Manning. The stratified, random sample included oversamples of African American and Hispanic youths across a range of socioeconomic and educational levels. The study aimed to improve our understanding of racial diversity and health disparities by identifying sexual risk-taking and variability in timely HIV testing for racially and ethnically diverse college students. Our findings showed that African American respondents reported that they were more likely to be sexually non-exclusive, and they were also more likely to be tested for HIV, compared with White and Hispanic respondents. Further, gender, age, and race were not associated with reported condom use. African American respondents were more likely to be tested for HIV. Men were less likely than women to be tested for HIV. Individuals who are sexually exclusive were less likely to be tested for HIV.

**Name:** Katie Finch  
**Major(s):** Sociology  
**Institution:** Bowling Green State University  
**Faculty Advisor(s):** Susan Brown, Sociology  
**Poster #:** 76  
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#### Unmarried Older Adults and Economic Well-Being

The institution of marriage has undergone changes in the past several decades. Among these are shifting marriage patterns among older adults. Today, an increasing proportion of the older adult population is unmarried (Lin & Brown, 2012). Researchers have seen an escalation in the prevalence of gray divorce, which is a term that describes divorce that occurs after the age of 50. There also has been a surge in the never-married population (Lin & Brown, 2012). In 2010, the percentage of women ages 65 and older who were widowed was about equal to the percentage of women who were married (Jacobsen, Kent, Leem & Mather, 2011). The United States is an aging society. By 2050, the population of those 65 years and older is expected to more than double yet little is known about how the unmarried fare in later life particularly their economic well-being (Jacobsen et al., 2011). With more and more people entering retirement alone, their economic well-being assumes greater importance.

Ample research has shown marrieds fare better financially than unmarries. Building on the research conducted thus far on gender and marital status, this study investigates the role gender plays into wealth accumulation. But what are the differences among the unmarried groups of men and women and what other factors play a role in economic well-being? More specifically, what demographic factors impact an individual's ability to save 15% of their annual income solely for retirement. Demographic factors such as educational attainment, race, and gender have been shown to influence wealth accumulation.

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**Poster #:** 77

#### Characteristics of Social Support from Peers in Grade 6 Children

Using data from National Institute of Child Health and Human Development Study of Early Child Care and Youth Development (SECCYD), a longitudinal study of children and their families, I investigate factors that are related to children's perceptions of peer social support during grade 3 to grade 6. I tested the variables including: age, gender, race, early closeness with the mother, and mother's education. Children report higher levels of peer support at grade 6 than grade 3. At grade 6, girls report higher levels of peer support than boys; and early closeness with mother is positively related to children's peer social support. Race and mother's education were not found to be significant in influencing peer social support.

## Undergraduate Research Symposium Poster Presenter Abstracts

### Sociology Cont.

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**Poster #:** 78

### **Violent Perpetration and the Interplay of Family and School Socioeconomic Segregation**

Using data from Waves I (1994-1995) and III (2001-2002) of the National Longitudinal Study of Adolescent to Adult Health, I examine the relationship between school socioeconomic segregation and violence in adolescence and the transition to adulthood. In addition, school characteristics which may mediate these relationships are considered. In adolescence, students from low socioeconomic status (SES) families attending primarily high-SES schools are less likely to perpetrate violence compared with their peers of the same class. Middle class students in primarily low-SES schools are more likely to engage in violence than their middle class peers, as are higher SES students in low-SES schools. In the transition to adulthood, low-SES respondents who attended primarily middle class schools had the highest likelihood of violent perpetration compared with all other family-school socioeconomic status pairings, whereas middle class respondents who attended high-SES schools were least likely. The significance of these findings, and the role of additional school-level characteristics are discussed.

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**Poster #:** 79

### **The Association Between Family Relationships and Fathers' Psychological Well-Being**

Using data from the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development (SECCYD), a longitudinal study of children and their families, I examine how family relationships, such as father-mother and father-child relationship quality, are related to fathers' depressive symptoms and whether these associations vary by level of education, an indicator of socioeconomic status. Results show that fathers who report poor relationship quality with their children when their children are in grade 3 are more likely to report clinical levels of depressive symptoms when their children are in grade 5. Similarly, fathers who report poor relationship quality with their partners--their children's mothers--when their children are in grade 3 are more likely to report clinical levels of depressive symptoms when their children are in grade 5. These associations are stronger for fathers without a college degree than those with a college degree.

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**Poster #:** 80

### **Multicultural Advertising and Updated Branding for Wedding Photographers**

A traditional image of a couple getting married includes one man, one woman, who are young, white, and do not have children. Yet, demographics of prospective couples have become more diverse in terms of age, race-ethnicity, sexual orientation, and life stage. Do contemporary photographers adhere to portrayals of the traditional image when posting photographs to their websites, or is there a shift toward diversity in featured couples?

A content analysis was conducted using photographs from photographers' Wedding Wire profiles, personal photography websites, and professional Facebook pages. Four photographers were chosen from the Midwest and four photographers were chosen from the West Coast. Within the regions, the photographers were divided between the top two largest cities: Chicago, Illinois, Indianapolis, Indiana, Los Angeles, California, and San Francisco, California. Photographers were found on WeddingWire.com using the highest and lowest average ratings received, and a minimum of 20-50 ratings (depending on city).

The results show that photographers are still adhering to the traditional image of couples. The largest non-traditional representation is shown with non-white couples, with older couples being the least likely to be represented. Unexpectedly, Indianapolis shows more diversity in age and family structure than the other cities. Race and ethnicity generally represent the general trend in each region, except for Chicago, which had low representation. For sexual orientation, as expected, Indianapolis had low representation, and surprisingly, Chicago had the lowest.

# Undergraduate Research Symposium Poster Presenter Abstracts

## Visual Communication Technology

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**Poster #:** 26

## Touch Screen Prototyping

This study evaluated the usability of *Sing N Sketch*, a touch screen application that combines singing and drawing - the pitch and amplitude of the user's voice controls the color and pressure of the stroke that is drawn. Participants completed a list of tasks using the application and provided feedback. The data collected during this study will help improve the user interface of *Sing N Sketch*.