

The Ohio State University at Lima

Undergraduate Research Forum

April 6, 2016

Library, 12:00-2:00



THE OHIO STATE UNIVERSITY

LIMA

Purpose

The Lima Campus Undergraduate Research Forum is designed to encourage students to actively engage in research. Beyond the Lima Campus Forum, participation in the Denman Undergraduate Research Forum, the University Libraries Research Prize, or publication in JUROS are all strongly encouraged, although faculty and students are welcome to pursue any appropriate forum for their discipline that will showcase undergraduate research.

Thank You

We would like to thank Dean Gilbert for her support of this Forum. Thanks also to the support given by the Student Life.

PROGRAM

1. **Rebecca Elting** - *A Test of the Effectiveness of Permethrin to Reduce Arthropod Abundance and Increase Nesting Success of the House Wren (Troglodytes aedon)*
2. **Erica Harvey** - *Using Plumage Reflectance to Distinguish between Greater and Lesser Prairie-Chickens in an Area of Sympatry*
3. **Nikki Ellis** - *Dorian Gray's Anatomy: A Decadent Dissection*
4. **David L. Braun** – *Project Fireflies*
5. **Nikki Ellis** – *Machine Heart*
6. **Giuseppe Fricano** – *Winter Siblings*
7. **Beverly Steele** – *Autumn*
8. **Megan Azzarello and Bekka Forster** - *Assessment of College Students' Food Insecurity at a University Regional Campus*
9. **Benjamin Young** - *Effects of number of changes, temporal appraisals, regret and self-determined vs. socially forced changes in possible self on self-concept clarity, confidence in current possible self pursuits, life purpose, well-being and self-esteem*
10. **Katharine N. Black** - *Meditation-Focused Attention, Hypnotic Susceptibility, and Problem Solving*
11. **Katrina Wireman** - *Mothers' Sophisticated Vocabulary and Children's Language Growth: Two Approaches*

ABSTRACTS

Rebecca Elting

Faculty Sponsor: Dr. Jacqueline K. Augustine (Department of Evolution, Ecology, and Organismal Biology)

A Test of the Effectiveness of Permethrin to Reduce Arthropod Abundance and Increase Nesting Success of the House Wren (*Troglodytes aedon*)

Parasites often induce stress in their host, impacting hosts' survival and reproductive success. This impact may be significant to the host, or hardly noticeable, depending on the parasite and intensity of the infestation. Some commensal organisms can actually be neutral or beneficial to the organism, such as when they feed on detritus. One way to determine the effect of parasites is to fumigate the infested area with insecticides. My study has two purposes. First, I determined if arthropod infestation affected nesting success of house wrens (*Troglodytes aedon*). Secondly, I looked at the distribution of arthropods in nests treated with permethrin, or sprayed with water as a control. Nesting success and mite abundance data was collected from 72 first nests and 19 re-nesting attempts between April to August 2015 in Lima Ohio. Nestlings were weighed 10 days after their hatch date. Arthropods were collected, and counted from the nests after the nestlings had fledged. Mite abundance was significantly reduced by permethrin; however, ant and other arthropods were not significantly reduced. Nestling success was not affected by ant or mite abundance. Permethrin is an effective fumigate for controlling some arthropods. My findings corroborate other studies that have shown house wren reproductive success was not affected by nest mite infestation. Further research should utilize a comparative framework to determine when mite infestations affect nesting success, because some species show negative correlation and others seem to be unaffected.

Erica Harvey

Faculty Sponsor: Dr. Jacqueline K. Augustine (Department of Evolution, Ecology, and Organismal Biology)

Using Plumage Reflectance to Distinguish between Greater and Lesser Prairie-Chickens in an Area of Sympatry

Evolution is the driving force which propels change within populations. In many bird species, it has been shown that females choose their mates based on the coloration of their feathers. The purpose of this experiment was to determine whether coloration may have played a role in species recognition and mate choice in Greater and Lesser Prairie-Chickens (*Tympanuchus cupido* and *T. pallidicinctus*, respectively). To determine whether plumage can be used to differentiate between the species, feathers were plucked from birds in two reference locations in which only one species was present, and in an area of sympatry. Measurements were taken from each feather including length of the feather, width of the subterminal bar, number of complete dark bars, and UV and color reflectance readings from the dark bar and light bar. Two discriminant analyses were conducted; one with all feather measurements and one without the two brightness readings. This allowed us to determine if spectrometry readings improved our ability to differentiate between the species. The discriminant analysis with color differentiated the reference populations better than the analysis without color (lowest probability of correct species identification in the reference population was 0.916 with color versus 0.840 without color). Out of 96 individuals in the area of sympatry, I determined that there were 7 hybrids, for a 7.3% hybridization rate. Greater and Lesser Prairie-Chickens vary in many measurements, yet the hybrids had some measurements such as the feather length and darkness of the dark band that did not fall between the values for the parent species. In summary, color helped differentiate the species better than excluding it, and should be included if species identity is necessary for future research. The hybridization rate reported here is higher than the 5% hybridization rate that has been reported in the Greater Prairie-Chicken/Sharp-tailed Grouse (*T. phasianellus*) hybrid zone.

Nikki Ellis

Faculty Sponsor: Dr. Beth Sutton-Ramspeck (English)

Dorian Gray's Anatomy: A Decadent Dissection

This paper argues that Oscar Wilde's "*The Picture of Dorian Gray*" uses allusions to anatomical science and bodily analysis to provide insight into the novel's theme of necessary self-experimentation for the achievement of a higher self. There is much criticism on Wilde's commentary about science and its influence on art. Heather Seagroatt's article, for example, argues that Oscar Wilde aestheticizes science as

an attempt to appropriate artistic elements into its influence. However, scholars seem to overlook Wilde's allusions to anatomical study and practice, which was morally controversial in the Victorian era and coincided with the grotesque and unconventional imagery of the rebellious decadent movement.

Oscar Wilde's use of heart imagery and Basil's love for Dorian Gray as an example of how denial of fleshly passions inhibits the growth of creative thinking. Basil's refusal to publicly display his portrait of Dorian - what he describes as his "heart" being placed under a microscope - demonstrates how censorship of one's carnal desires hinders artistic growth and success. Dorian experiences this bodily censorship as well. Basil's concern for Dorian's innocence in the face of Lord Henry's materialistic and carnal ideas inhibits Dorian's development and self-exploration. Dorian is literally kept on Basil's pedestal of art as a subject of purity and innocence, a place where the discovery and analysis of one's decadent truths is prohibited. The theory of bodily censorship is furthered in the relationship between Dorian and his portrait, as Dorian's mixture of fascination and shame of his bodily decay illustrates an unhealthy ignorance of his corporeal truths and the need to fully confront carnality for self-understanding. This idea of bodily censorship as an inhibitor in developing the higher self is then solidified with Dorian stabbing his own portrait in the heart, signifying the final cut into the carnal and uncensored part of himself.

David L. Braun

Faculty Sponsor: Dr. Doug Sutton-Ramspeck (English)

Project Fireflies

Storytelling is a crucial method used in contextualizing data, chronicling information, and ultimately even viewing the world. The short story "Project Fireflies" takes a nontraditional approach in its narrative to provide an interesting perspective on how stories are told and, in turn, how we perceive the world. Stories can employ a linear plot, create an omniscient point of view, follow the viewpoint of a single narrator, or employ a variety of other methods, each of which produces its own unique results. Omniscient and other all-knowing methods remove what are often the most appealing aspects of a narrative: mystery and perspective. The mystery, and subsequent discovery, present in "Project Firefly" is intended to entertain the reader while also utilizing the perspective presented to explain the fundamental imperfections and intrigue of storytelling. "Project Fireflies" presents itself as a research file attempting to explain the catastrophe and downfall of the titular event, Project Fireflies. The reader witnesses Dr. Winand's selfish curiosity and blind thirst for knowledge drive him to push the ship and his crew past their limits and the

attempts of James Buchal, director of this project, to hide this failure. This allows the reader to see a rendering of events in a similar manner that one might observe through their own research. By receiving only one aspect of the narrative we are left with only Winand's queries and a desire to answer them. The bottom of the ocean is filled with mystery, questioning, wonderment, and surprise but we only want to know about the life forms and Winand's trustworthiness due to this select slice of perspective. Throughout the narrative kernels of answers arrive, be they in the form of benthic life forms or in the Dr. Winand's inquisitive selfishness that costs the crew their lives. Storytelling is an attempt to create answers where they either do not or cannot exist. "Project Fireflies" attempts to display the limits of storytelling and, by contrast, our own perceptions of reality.

Nikki Ellis

Faculty Sponsor: Dr. Doug Sutton-Ramspeck (English)

Machine Heart

Machine Heart is a three-chapter short story which attempts to reimagine turn of the century medical innovation with a steampunk aesthetic in order to shed light on our own progressing world of technology and its fatal push for human perfection over emotion. The story fuses elements of modern science-fiction, gothic horror, romance, and classic nineteenth century writing styles in order to experiment with and challenge the reader's view of nineteenth century human progress. *Machine Heart* focuses on the character of James Brennan, a young man struggling with a heart condition since childhood, and his determination to be a fully efficient human by receiving a bio-robotic heart. James Brennan's story is presented in three stages, following him from his fragile state in his home of Cogpoint New York to his hardened, mechanical life as a medical experiment in the city.

Inspiration for *Machine Heart* is heavily based on nineteenth century gothic and science-fiction novels. The monster of Mary Shelley's *Frankenstein* was used as a basis for the creation of James Brennan. The monster in Shelley's novel is created with various body parts out of Dr. Frankenstein's need to push the boundaries of science; the creature is then abandoned in a hardened world without a feeling of humanity. James is created by Dr. Andrew Brennan, his innovative and capitalistic brother, and is left in a similar state of abandonment with a lack of human emotion. *Machine Heart* also draws inspiration from H.G Wells' *The Time Machine*, as the novel has a particular focus on the subject of human progress and the regression of

humankind. Lastly, a review of the gradual change of Dorian Gray in Oscar Wilde's *The Picture of Dorian Gray* helped to establish a sense of James Brennan's progressing loss of humanity and emotion.

Giuseppe J. Fricano

Faculty Sponsor: Dr. Doug Sutton-Ramspeck (English)

Winter Siblings

Winter Siblings, a creative chapbook written as a final project for an Independent Study (English 5191) attempts to dismantle the societal boundaries and constructs of artistic genre in order to subvert the expectations of the reader. As an exploration of postmodern writing, the project blends elements of poetry, fiction, and nonfiction into a form that deconstructs rigid genre categorization. *Winter Siblings* centers on a family of four with each member of the family corresponding to one of the four seasons of the year. The story presents a series of fragmented events that occur to Mother and Father in their youth and to Brother and Sister during their coming of age, through adulthood, and at the ends of their lives.

The study began with research and technical reading in order to establish a grounding of knowledge in the realm of postmodern theory. *Grammatology* by Jacques Derrida was used as a reference point for the literary theory of deconstruction. The second primary source of technical reading was *Being and Nothingness* by Jean-Paul Sartre. Sartre's writing, of course, predates the postmodern era, yet postmodern literature often grapples with existential issues of existence, and ultimately, the search for meaning.

The second half of research for the project included the close readings and analyses of several authors who regularly succeed in violating the assumptions of their readers. Lydia Davis, Donald Barthelme, and Mark Z. Danielewski were examined in the hopes of discovering the methodology used to successfully violate the reader's expectations of written, literary work within a specific literary genre. These three authors deftly dance between the boundaries of poetry and fiction; ultimately, *Winter Siblings* endeavors to do the same. Finally, a trip to the Toledo Museum of Art was conducted as a method for artistic inspiration prior to the completion of the first draft.

Beverly Steele

Faculty Sponsor: Dr. Doug Sutton-Ramspeck (English)

Autumn

Autumn is a collection of flash fiction pieces, or chapbook, and is dedicated to subverting our societally prescribed notions of normality, particularly as related to social and sexual mores. Each work in this collection addresses a specific societal norm, like motherhood, sexuality, body image, and psychosis. In “Still Looking,” a visually unassuming scene between mother and child is made complex when a new mother’s thoughts are explored and subverted. At the beginning of this flash fiction piece, the writing feigns compliance into societally prescribed notions of motherhood being natural to women; in a short span of time, the reader will notice the incongruences when the mother’s tears threaten to drown the newborn. The piece, “Weighted Down,” likewise plays into societal ideologies only to subvert them and make the reader question society’s preference for a smaller body size. In writing, “Simulation,” and “Illusion,” the entire pretext of normality is completely destroyed in the first sentence—leaving the reader grasping for puzzle pieces to reassemble the picture. The beginning of “Simulation” raises several questions about sexuality: “The only time I had sex with another woman was on an Xbox” (14). This sentence aims to mislead the reader into looking for homosexual connotations, only to undermine that expectation by suggesting a flaw in the character’s preference of a simulated world over reality. The opening sentence of “Illusion” immediately invites the reader to find psychological implications: “The first time I followed my girlfriend, I did not know her name yet” (28). Using “The first time” as an opening phrase piques the reader’s curiosity concerning the relationship between the narrator and his girlfriend—only to question the existence of the latter. This effort to violate expectations is intended to expose the inherent contradictions in contemporary culture and thus illustrate how societal norms differ from individual desire.

Megan Azzarello and Bekka Forster

Faculty Sponsor: Dr. John R. Snyder (Health and Rehabilitation Sciences) and Dr. Kamesh Casukhela (Mathematics and Statistics)

Assessment of College Students’ Food Insecurity at a University Regional Campus

Food insecurity is the limited or uncertain availability of nutritionally adequate and safe foods, or the ability to acquire such foods in socially acceptable ways. Food insecurity has been associated with lower academic performance, decreased psychosocial function, and poor health. With the rising cost of attending institutions of higher education, college students potentially face difficult decisions about whether to pay for tuition and fees versus purchasing food. The literature contains several studies of college student food insecurity ranging from 45-72%. However, no studies of students attending a university regional campus have been reported. Therefore, the purpose of this study is to assess the prevalence of food insecurity among students attending The Ohio State University at Lima. Using a written survey, answers to two research questions are sought: (1) what is the prevalence of food insecurity among students attending Ohio State Lima, and (2) what are the correlates of food insecurity among students at Ohio State Lima.

The study was conducted as a cross-sectional, nonprobability, written survey during spring semester 2016 on the Ohio State Lima campus. The sample was one of convenience with a goal of 100 respondents from a population of 970 students. The survey was two pages in length, consisting of 20 items. The first 6 items, determining food security status, are standardized questions from the U.S. Department of Agriculture. The remaining items are variables (e.g. overall health, if a student lives with family versus in an apartment, credit card debt, receiving financial aid, etc.) that may correlate with food insecurity. An incentive to participate in the survey was offered, a chance to be entered in a drawing for one of six cash cards. This human subjects' research has been approved by The Ohio State University IRB.

A total of 102 responses were received, representing 10.5% of the population. Based on responses to the food insecurity items, 61.8% of Ohio State Lima students are food insecure. The majority of students were female (66.7%), 18-24 years old (89.2%), were enrolled full-time (98.0%), single (94.1%), held a job while going to college (83.3%), and earned less than \$15,000 per year. Self-reported health rating revealed that 26.5% believed their health to be "fair or poor" despite 97% having health insurance. While the majority of respondents lived in a home with family or relatives, 43.1% indicated they lived off campus/with roommates. Credit card debt was low among the respondents with 70.6% reporting no credit card debt. Correlation analysis and multivariate binary logistic regression models revealed three variables correlate with food insecurity: (1) self-reported rating of health; (2) place of living; and (3) credit card debt.

Benjamin Young

Faculty Sponsor: Dr. Patrick J Carroll (Psychology)

Effects of number of changes, temporal appraisals, regret and self-determined vs. socially forced changes in possible self on self-concept clarity, confidence in current possible self pursuits, life purpose, well-being and self-esteem

Recent research shows that greater possible self (PS)-failure (downward possible self-revision) experiences predict greater core self (CS)-disturbances (lower self-esteem and well-being). The present project extends these findings to examine the effect of self-perceived quality (vs. quantity) of prior PS-revisions on subsequent changes in CS-quality. As predicted, Study 1 showed that those with greater prior revision experiences experienced greater declines in self-esteem and well-being when they had lower temporal PS appraisals and greater regret over prior possible self-revisions. As predicted, the Study 2 results showed that, among those with more (vs. less) changes, those who reported more socially forced than self-determined PS-revisions at T1 actually reported greater T1-T2 decreases in life-purpose. Moreover, among those with more changes, those who reported more socially forced PS-revisions at T1 and greater increases in socially forced changes from T1-T2 reported greater T1-T3 decreases in self-concept clarity and lower present PS confidence at T3. This work extends past work to show that the effect of prior PS-revisions on revisions in core self-quality depends as much upon the perceived quality as the sheer quantity of those changes.

Katharine N. Black

Faculty Sponsor: Dr. Joseph Green (Psychology)

Meditation-Focused Attention, Hypnotic Susceptibility, and Problem Solving

Frewen (2008; 2011) developed the *Meditation Breath Attention Scores* (MBAS), a test of mindfulness where participants close their eyes, concentrate on their breathing, and periodically report if they are either focused or distracted. We explored whether the MBAS might enhance the ability to solve anagram word puzzles. Between two anagram trials, we randomly assigned participants to receive the MBAS, a progressive muscle relaxation induction (PMR), or to watch a psychology video (control). Half of the participants were told that their respective intervention would help them solve anagrams *more quickly and accurately* on the second trial.

A total of 314 students participated in the current study. Final analyses were based on N=257 (n=132 male and 125 female) participants. A total of 57 participants were eliminated; 29 reported engaging in meditation on a regular basis, 9 revealed extreme anagram difference scores, and 19 either provided incomplete data or failed to follow instructions. We calculated difference scores across our two anagram trials by subtracting the number of correctly solved anagrams on trial 1 from those on trial 2. We conducted a 3 (condition) x 2 (expectancy) x 2 (gender) ANOVA on anagram difference scores. The triple interaction, double interactions, and main effects for expectancy and gender were non-significant. As predicted, we found a main effect for condition revealing that participants who completed the MBAS training showed greater improvement on the second anagram trial relative to those that watched the video. Greater improvement was observed following MBAS training relative to PMR as well; however, the difference between means was not significant. We also collected measures of absorption, fantasy proneness, and hypnotic susceptibility in order to examine whether these variables might predict mindfulness as measured by the MBAS. Hypnotizability but not absorption or fantasy proneness correlated with MBAS scores.

Katrina Wireman

Faculty Sponsor: Dr. Virginia Tompkins (Psychology)

Mothers' Sophisticated Vocabulary and Children's Language Growth: Two Approaches

A major goal of educators and parents is to promote children's language skills prior to kindergarten. Several studies have shown that parents who use more sophisticated vocabulary when talking to their children have preschoolers with larger vocabularies. There is also experimental evidence that directly teaching children sophisticated vocabulary in the classroom leads to gains in their understanding of those same words. There are two main approaches to quantifying adults' sophisticated vocabulary to children; Beck's three tier classification system, which is used in designing classroom interventions, and the Chall and Dale list, which is used in quantifying mothers' input to children. However, there are criticisms of both approaches, and they have never been compared in the same study. The purpose of this research project is to examine mothers' sophisticated vocabulary to preschoolers in terms of both approaches to determine the criterion validity of these measures in predicting growth in preschoolers' vocabulary. Although both are hypothesized to predict children's vocabulary growth, it is not clear whether one will emerge as a better predictor. To address this research question, 50 mother-child pairs participated in reminiscing about three

past events at Time 1. Children's receptive vocabulary was assessed at Time 1 and six months later at Time 2 using the standardized Peabody Picture Vocabulary Test. The reminiscing interactions have been transcribed, and we are currently analyzing the files in terms of the two sophisticated vocabulary classifications. To determine the predictive validity of the two classifications of sophisticated vocabulary, each will be entered into separate hierarchical regressions predicting Time 2 vocabulary, controlling for Time 1 child age, vocabulary, and SES. This study will provide important insight for researchers wishing to select the best operationalization of the construct of sophisticated vocabulary by providing empirical evidence regarding which approach is more strongly related to children's vocabulary gains.

2016 Undergraduate Research and Mentoring Committee

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