Undergraduate Research Forum

Poster Session

March 26

12:45pm, Library

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 Snyder for his support of this Forum. Thanks also to the support given by the Lima Campus maintenance department, the Baron's Bistro, and Lima Campus Student Senate.

Faculty Judges

Gosia Gabrys, English
Beth Gray, Biology
Fabio Leite, Psychology

The first, second, and third prizes, in addition to a student-choice award, will be awarded at the Ohio State University at Lima Awards Ceremony on April 19, 2013.

Mohammad Khan
Faculty Mentor: Dr. Jacqueline Augustine (Biology)

Habitat Characteristics Associated with Nest Site Selection and Reproductive Success of House Wrens (*Troglodytes aedon*)

Habitat characteristics influence the survival and reproduction of animal species. House Wrens (*Troglodytes aedon*) are an abundant species of songbird, which are tolerant of humans, and nest readily in artificial nest boxes. We hypothesized that House Wrens would attempt more nests and raise more young in areas that contained more natural vegetation. We also hypothesized that feeding rate will be higher in areas that contain natural vegetation. Nesting boxes were placed in three habitats (100-123 boxes per year): a woodland area, a golf course, and a residential area. We quantified habitat characteristics within 15m of a nest box: % canopy cover, % shrub cover, % natural grass cover, % mowed grass cover, number of trees >10cm in diameter, and the presence or absence of blacktop, pine trees and other human structures. Between April and August 2010-2012, nest boxes were checked twice a week for signs of nests or eggs. Ten days after hatching, the nestlings were banded with aluminum and colored leg bands to aid in individual identification. We observed that more nests were attempted in boxes closer to tree trunks and human structures, such as fences. If a nest was successful, the number of nestlings banded increased with more vegetation. Feeding rates did not vary by habitat for four day observations. However, when the nestlings were 10 days old, the number of visits increased when blacktop was present. Our first hypothesis was supported; house wrens attempted more nests and produced more nestlings in natural areas. Our second hypothesis was not supported; feeding rates for House Wrens did not vary from one habitat to another. This research supports the idea that human alteration of habitats may be detrimental to reproduction of songbirds. Particular care should be taken to maintain natural habitats if threatened or endangered birds are present.

Nathaniel J. Sackinger
Faculty Mentor: Dr. Jacqueline Augustine (Biology)

Do Male House Wrens (*Troglodytes aedon*) Vary Their Singing Among Various Reproductive Stages?

The vocalizations of male songbirds can function in attracting mates and in defending territory. If song is used for attracting a mate, song output should decline following pairing. If song is used primarily for territory defense, song output should be constant throughout reproduction, because territories are maintained throughout multiple reproductive attempts within one breeding season. If song were used for communicating an "all clear" signal for females to leave the nest, song output would be highest during incubation, when females are spending the most time on the nest. The purpose of this study was to determine whether the song of male House Wrens (*Troglodytes aedon*) changes throughout the reproductive cycle. Male House Wren song was recorded by attaching a microphone to the nesting box during four different stages of reproduction (nest-building, laying, incubation, and nestling feeding). The vocalizations were analyzed for song rate (# songs/minute), duration (length of each song), and frequency. Song rate was found to be greatest during nest-building stage and did not vary during the other stages. Song length was found to be lowest during feeding stage, but did not vary in the other stages. Results indicate that song may be used primarily for finding mates, and not territory defense or as an 'all clear' signal. However, we may not be detecting song used during territorial defense, as our microphone was stationary and located on the nesting box. Future studies should follow individual males to determine whether males also sing away from the nest box, or shift the location of singing during the breeding season.

Hasan Sheikh
Faculty Mentor: Dr. Eric Juterbock (Biology)

Do Smaller Salamanders Actually Lose Water at a Faster Rate During Their Active Period?

Plethodontid Salamanders are regularly active within their habitats. In the Southern Appalachians both large adult and yearling salamanders have been observed to climb up on vegetation. Of many potential obstacles that these salamanders have the most crucial issue likely is water loss. As amphibians, salamanders cannot control their loss of water to the environment via cutaneous evaporative water loss. This water loss should be affected by body size and how far above ground the animal goes. We placed plaster models of large adult (LAD) and yearling (Yrlg) plethodontids in different microhabitats. The study was done in Nantahala National Forest, NC. The microhabitats we studied were litter, Rhododendron leaves, and Rhododendron trunks. The weighed, saturated plaster models were placed after dark at their locations for 9 hours. Before sunrise these models were collected and re-weighed. Four tests of the hypothesis that Yrlg models lose water faster than LAD models were supported ($p \leq 0.006$). The data also shows that the Yrlg size loses more water faster and as a percent of body weight than the LAD. The study concludes that smaller salamanders risk more climbing than large salamanders.

Rebecca Steward
Faculty Mentor: Dr. Eric Juterbock (Biology)

Water Loss during Climbing in Plethodontid Salamanders of Intermediate Body Size

Because plethodontid salamanders are unable to control cutaneous evaporative water loss they are very susceptible to such loss. In the southern Appalachians, plethodontid salamanders regularly climb up on vegetation. I predicted that the higher the salamanders climb the greater the water loss they will have. Plaster models of salamanders' were used to test water loss in their natural habitat. The models were soaked in water, weighed and then put out after dark. The models were then retrieved before the sun came out and weighed again. They were out for approximately nine hours. The plaster models were tested at three locations: the Nantahala Mountains, NC, Logan County, OH, and Great Smoky Mountains, TN. Two sizes of models compared. The larger of the two models was approximately two-thirds more mass than the smaller size model. For both model sizes at all three sites, there were nine tests of the hypothesis that models on tree trunks would lose the water faster than those on surface litter. For all nine of the tests, the hypothesis was accepted ($p \leq 0.001$). Since more water was lost faster up on tree trunks, I concluded that climbing is riskier behavior than remaining on the ground.

Keinan Taja
Faculty Mentor: Dr. Eric Juterbock (Biology)

Water Loss Can Affect the Climbing Behavior of Woodland Salamanders

Salamanders regularly climb on vegetation in the southern Appalachian mountain region, but climb much less in Ohio. The purpose of this experiment is to explain why Ohio salamanders do not climb as regularly as their counterparts in relation to the vapor pressure deficit (VPD) and height above ground on percent water loss. Salamanders do not have any barriers to cutaneous evaporative water loss. Plaster models were soaked with water and left in woodland habitats in Nantahala National Forest, NC, USA, and Logan County, OH, USA overnight. The amount of water loss, position of the salamander and the VPD were recorded along with other relevant information. The vapor pressure deficit in Ohio was found to be greater and more varied (0.094 lowest to 0.676 highest) in comparison to North Carolina (0.069 to 0.109). Models at both sites lost significantly less water on litter compared to trees and both lost less water with a lower VPD. The data show that while some days on Ohio may be acceptable for climbing activities, salamanders in Ohio probably climb less due to a risk of losing more water.

Katharine Black
Faculty Mentor: Dr. Joseph Green (Psychology)

Mindfulness, Focused Breathing, and the Ability to Solve Anagrams

Although experts differ in their definition of mindfulness, most agree that it involves attending to one's experience in the present moment and the ability to keep distracting thoughts or emotions at bay. Frewen and colleagues (2008; 2011; in press) operationalized mindfulness as meditative concentration. They developed the *Meditation Breath Attention Scores* (MBAS) as a performance-based test of this construct. During the MBAS, participants are instructed to mindfully attend to their breathing with their eyes closed. Periodically, a chime is sounded and participants indicate whether they were focused on their breathing at that moment. High scores on the MBAS suggest an ability to maintain focus and not get distracted by noise, thoughts, ideas, or emotions. Frewen et al. (2011) found associations between the MBAS and various measures of mindfulness, including the *Five Factor Mindfulness Questionnaire (FFMQ), Bear et al., 2006).* In the present study, we sampled 96 OSU Lima students' ability to solve word puzzles under quiet and distracting conditions. Across three trials lasting 4 minutes long, participants tried to solve up to 15 anagrams presented to them on a single page. Two consisted of high-imagery words and one of low-imagery words. However, the anagram lists were equal in terms of difficulty. All three lists were randomly ordered across participants. During the first trial, participants solved puzzles in a relatively quiet environment. During the remaining two trials, an amplified recording called out random letters every second. We administered the MBAS before the last trial and suggested that the prior breathing training would help them relax, concentrate, and not get distracted. Participants also completed the FFMQ and other subjective measures about their performance. We hypothesized that persons with high mindfulness ability (based on the FFMQ and MBAS) would show relatively less performance degradation on the distraction trials.

Richard Smith
Faculty Mentor: Dr. Joseph Green (Psychology)

Does Time of Day Affect Hypnotic Responsiveness?

The present study examines levels of hypnotic responsiveness as a function of the time in which the session is conducted. Hypnotizability was measured using the Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A; "Harvard" scale). The mean Harvard scores were compared among nine sessions conducted at different times of day. When comparing mean Harvard scores between all sessions, the peak levels of hypnotizability were found at 10 a.m. Prior to hypnosis, subjects completed a modified version of the Alertness Questionnaire (AQ) to establish preferences for performing tasks at different times of the day. Subjects who reported preferences for performing at least six tasks during a certain time of day were classified as morning persons, afternoon persons, or evening/night persons. When we examined the mean Harvard scores for subjects who participated in sessions conducted at times of day matching their self-reported preferences, no statistical significance was found. Conversely, the 10 a.m. session still showed the highest Harvard scores, regardless of individual preferences for times of day.

Tia Ruark
Faculty Mentor: Dr. Tryntje Helfferich (History)

"Sing a Song of Sixpence, A Pocket Full of Rye"

In the decade following the War of Spanish Succession (1701–1714), a time now deemed the Golden Age of Piracy, a relatively small community of larger-than-life pirates and admirals ruled the world's waterways. Scholarly research surrounding the most legendary pirates of this era abounds, often focusing on debunking myths and exposing the nitty-gritty of daily life on a pirate ship. Nevertheless, such scholarship almost entirely neglects the undeniable connection between piracy and England's Royal Navy. To correct this failing, this project was designed to offer comparative research encompassing the economic, moral, social, and legal aspects of life at sea on both pirate and naval ships in the early 18th century. The results of such a comparative approach shed new light on the motives of some of history's most notorious and brutal men and suggest why they may have turned to piracy. Since the end of the Golden Age of piracy, a great pirate mythology has risen to replace the hard facts of pirate life. Whereas the fictional pirates of movies and literature are portrayed as quixotic scoundrels who existed outside of the law and societal norms to live a lavish life full of adventure and romance, real pirates, utterly more fascinating than the carefully drawn characters of *Treasure Island*, *Peter Pan*, and *Pirates of the Caribbean*, did not lead a romantic life. While the lure of freedom and adventure may well have played a part, many men chose piracy because, in comparison, sailors aboard contemporary naval ships were treated abhorrently and piracy proved to be far more lucrative than a legitimate life at sea.

Natalie Allen
Faculty Mentor: Mr. Doug Sutton-Ramspeck (English)

The River

The River is a chapbook, a short book of poems centered around a single theme, intended to upend the typically positive associations of a river meeting its end at the mouth of the ocean, and to use that reversal to parallel the journey of a couple's failing relationship. To portray the theme, the structure of the chapbook is organized to reflect the couple's journey: "Epilogue," "Down Stream," "Open Waters," and "Prologue." Each section is named to show the different points of the relationship as well as to show the course of the river. Imagery is used throughout the collection to symbolize the negative progression of the relationship. While many of the images are of physical, tangible elements, they are typically dark and morbid and are paired with the human experience of a relationship to create the juxtaposition of destructive water images with a failing relationship. The technique of internal rhyme in the poetry also represents the disorganized development of the affair that ultimately leads to its end.

Sam Newport
Faculty Mentor: Mr. Doug Sutton-Ramspeck (English)

Iowa City Orchard

My poetry collection comes from English 4566, where our project for the quarter was to write a series of thematically-linked poems. My collection, *Iowa City Orchard*, is forty-one pages, primarily uses an unnamed woman as a narrator, and explores her relationship with her husband, Anton Chekhov. The emotional lives of the characters are represented through various forms of physical mutilation and Chekhov's misplacement to modern day Iowa from his time and place in 19th century Russia creates tension between his values and culture and those of his wife; the juxtapositions of the characters' values cultures and physical/emotional suffering are intended to challenge modern expectations on love, familial ties, commitment, and relationships. The four sections begin with a quote by Chekhov and include a letter from or to Chekhov about his wife, usually with an allusion to one of his short stories.

Zach Reneau
Faculty Mentor: Mr. Doug Sutton-Ramspeck (English)

CIRCUM/FESSION/

Through the use of deconstructionist and existentialist theories, *CIRCUM/FESSION/* uses a male speaker to explore the ambiguities of love and language, and to show the reader that he knows less about these two subjects than he might think. True to Derridean form, the chapbook examines binary oppositions such as love/lust, love/hate, and companionship/loneliness. In doing so, the reader is encouraged to accept that what he probably considers to be the "preferred" side of each binary is frequently not what he really prefers in practice, and that it is often the opposite that is true; or, at best, that both sides are more similar to each other than the reader might think. To show this ambiguity, the poems play with traditional forms to create something new and foreign to the reader. Further, each poem is prefaced by quotes from famous post-structuralist and existentialist writers and thinkers, such as Jacques Derrida, Søren Kierkegaard, and Albert Camus. These quotes are used to set forth a proposed meaning for each piece; after reading them – and after reading the entire chapbook -- the reader is left to decide if that meaning holds true, or if the text subverts it.

Gena Smith
Faculty Mentor: Mr. Doug Sutton-Ramspeck (English)

Exolescere

The division between society and wilderness is often thought to be as clear as a tree line. Examined in *Exolescere* is the harmonious breakdown and blending that occurs within both, through a catalyst such as cognitive memory. In these poems the theme of juxtaposed binaries emerges through concepts such as human/animal, natural/unnatural, healthy/unhealthy, and lucidity/confusion. These subtle deconstructions serve to suggest the idea that perhaps two binaries may be combined and accepted as interchangeable in the right set of circumstances. The particular circumstance contemplated in *Exolescere* is the loss of memory and cognition. In these poems is accentuated how the loss of memory may blur the lines between binaries that we, as a culture, assume to be stark oppositions to one another. As the poems proceed, these divisions begin to wither and fade until the reader, much like the speaker, enters a new plane of understanding in which the wall between the inside and the outside is broken down. In *Exolescere*, the reader is challenged to consider the existence of a fusion between what we may commonly think of as opposites, and in doing so we may find that the line is much thinner than we assume.

2013 Undergraduate Research and Mentoring Committee

Tina Schneider, Chair
Associate Professor, University Libraries
Director, Lima Campus Library

Jacqueline Augustine
Assistant Professor, Biology

Joseph Green
Professor, Psychology

Tryntje Helfferich
Assistant Professor, History

Young Ah Lee
Assistant Professor, Education

Nicoleta Roman
Assistant Professor, Computer Science/Engineering

Lima Campus Student Senate Advisor
Brad Ellis

The Ohio State University at Lima: Undergraduate Research
lima.osu.edu/students/research

The Ohio State University at Lima, 4240 Campus Drive, Lima, Ohio, 45804
lima.osu.edu