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April 18, 2014
Valhalla, Cartwright Center
8:30am – 12:30pm

SCHEDULE OF ORAL PRESENTATIONS

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11:00 to 11:20	**UR.7 Cole Nelson** **English Literature** **Devils in the Wilderness: How "Wilderness" Reflects Society's Margins**	**UR.14 Zachary Tully** **Physics** **Exploring the Collective Properties of 160Gd using the (n,n'γ) reaction**	**UR.22 Joel McReynolds** **Public Administration** **Service Learning From The Perspective Of Community Partner Organizations**		
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11:50 to 12:10	**UR.9 Nicholas Covaleski** **English & Philosophy** **St. Paul's Letter to the Romans: A Critical Approach**	**UR.16 Hannah Mueller** **Therapeutic Recreation** **The Deutschland Drive From Guttman to Gold: A Case Study of the 2012 German Women's Paralympics Basketball Team**		**GRAD.2 David Stoleson** **Software Engineering** **TOZE 2.0: Re-engineering GUI Editor and Type Checker for Object-Z Specification Language**	**UR.38 Brittney Long** **Women's, Gender and Sexuality Studies** **Colorism: Perceptions of Beauty**

UNDERGRADUATE STUDENT ABSTRACTS

UNDERGRADUATE POSTER PRESENTATION ABSTRACTS

Poster Session A
Valhalla Hall: 9:00am-10:45am

U.1 Viking Swords and their Social Significance

Erik Anderson
Advisor: David Anderson, Ph. D., Sociology and Archaeology

The counterfeiting of expensive, high quality goods is not a recent phenomenon; in fact, counterfeiting has existed for hundreds of years. This study examines 166 Viking swords, manufactured between the 8th and 11th centuries that carry the maker's mark 'Vlfberht'. Recent analyses have determined that many of these swords are counterfeit, based on spelling variants of the maker's mark and the metallic structure as well. Through the analysis of the swords, this study further separates authentic from counterfeit and combines this with analysis of the grave goods associated with the swords to determine the social status of the individual who was buried with the sword. Combined, these analyses will infer the social significance of these swords. This research contributes to an increased understanding of how branding and trademarks influence people's decisions when buying a product.

U.2 Sexting in Intimate Relationships

Jade Burt, Samantha Hofacker
Advisor: Casey Tobin, Ph. D., Psychology

Technological innovations have resulted in a larger number of quick and efficient means of communication. Furthermore, a wide variety of modes exist that can reflect varying levels of expression. One form of communication that has risen precipitously with technological innovations is sexting. Sexting, defined as the creating, sharing, receiving or forwarding of sexually suggestive/explicit messages or images, can be used for initiating, maintaining, and potentially enhancing or hindering relationships ranging from casual to committed. However, sexual disclosure via technology has been minimally investigated in terms of its influence on intimate relationship dynamics. This study investigates the association between the use of sexting and relationship satisfaction among college students in intimate relationships. An online survey was distributed to undergraduate college students in psychology courses from two universities in different regions of the United States. Participants who reported currently being in an intimate relationship (with same or opposite sex) that has endured for a minimum of three months were eligible for the current study. The survey consisted of several measures, which assessed sexting patterns and frequencies, relationship satisfaction, sexual satisfaction, perceived sext explicitness and motivations for sexting behaviors. The relationships between and among variables will be discussed.

U.3 Using X-ray Fluorescence to Quantify Lead Content in Vegetation

Caitlin Cullimore
Advisor: Colin Belby, Ph.D., Geography

Lead is a common environmental contaminant associated with numerous complications for both human and animal populations. Because of this, it is particularly important to have efficient, accurate methods of assessing lead content within all aspects of ecological systems. The most common current techniques for measuring lead content in vegetation, inductively coupled plasma (ICP) and atomic absorption spectroscopy (AAS) are expensive, unwieldy, and time-consuming. X-ray fluorescence (XRF) technology, which has been more commonly used to assess heavy metal content in non-biological samples, could offer a promising new approach to analyzing lead levels in vegetation; this would cut testing costs and time significantly. This project will test Lemna sp. (duckweed) samples from the La Crosse River Marsh with traditional methods and an XRF analyzer. By verifying XRF-obtained results in this way, it should be feasible to build a reliable calibration curve for quantifying lead content in vegetation via XRF analysis.

U.4 Effects of Hibernation on the Enteric Nervous System of the Thirteen-lined Ground Squirrels

Lauren Eliades, Amelia Ruiz
Advisor: Sumei Liu, Ph.D., Biology

The enteric nervous system is the intrinsic control of the digestive function. The aim of the present study is to investigate the adaptive changes in the enteric nervous system during hibernation that may help maintain the integrity of the gut and the low level activities of the digestive system. Results: There was no significant change in the total number of neurons in the myenteric and submucosal plexuses in winter torpor and interbout arousal ground squirrels. Choline acetytransferase (ChAT) is an enzyme catalyzing the synthesis of acetylcholine, a major excitatory neurotransmitter in the enteric nervous system. The number of ChAT-immunoreactive (IR) neurons in the myenteric plexus was significantly decreased during torpor, but returned to normal levels during interbout arousal. The number of ChAT-IR neurons in the submucosal plexus did not change during winter torpor and interbout arousal periods. Nitric oxide synthesis (NOS) is an enzyme catalyzing the synthesis of nitric oxide, a major inhibitory neurotransmitter in the enteric nervous system. There was no significant difference in the number of NOS-IR between summer-active, winter torpor, and interbout arousal animals. Substance P (SP) and vasoactive intestinal peptide (VIP) are also important neurotransmitters in the enteric nervous system. There was no significant difference in the number of SP-IR or VIP-IR between summer active, winter torpor, and interbout arousal animals. Conclusion: Hibernation does not change the total number of neurons in the enteric nervous system. Expression of NOS, SP, and VIP stays the same during winter torpor and interbout arousal periods. However, expression of ChAT is significantly decreased in the myenteric plexus during winter torpor. Since acetylcholine is a major excitatory neurotransmitter that stimulates gut motility, selective down regulation of ChAT may contribute to gut hypomotility during winter torpor.

U.5 On Ramp to Parallel Computing

Zackory Erickson
Advisor: Samantha Foley, Ph.D., Computer Science

Today parallel computing is used in almost every field of study. Any organization that solves problems too large for the average laptop to compute turns to parallel computing (which includes supercomputers, the “cloud”, and clusters of connected computers). The use of parallel computing is growing in academia and industry, however it is exceedingly difficult to learn and complex to use. Parallel computers are built primarily for performance. Thus, the common graphical interfaces that are familiar to so many people have been removed, leaving only an unfamiliar text-based interface. Our project, On Ramp to Parallel Computing, challenges the idea that parallel computing should be difficult to learn, and aims at increasing the ease of use of parallel computers. Through a web application users will be able to interactively launch programs on a parallel computer, while gradually learning the tools needed to use parallel systems directly. New users to parallel computing should be able to successfully launch a program on their parallel computer within seconds rather than days or weeks. As users feel more comfortable with parallel computing, they will be encouraged to take on more of the responsibilities, giving them control of the detailed build, configuration and launch settings. This poster will present the high level design and goals of this project, as well as the implementation details and challenges of working with a variety of parallel systems. We will describe how the system is designed for a variety of audiences, including students, users new to parallel computing, experienced users, and educators, all with the goal of making parallel computing easier to use. Lastly, challenges faced in building the system, and addressing security, scalability, performance and usability will be presented. With On Ramp to Parallel Computing growing in functionality, we would like to invite users to help evaluate the system.

U.6 Body Image Perception in Adolescent Males

Jamie Erickson, Renae Elwood, Ryan Kacvinsky, and Erik Krueger
Advisor: Karen Skemp, Ph.D., HFS, CSCS, Community Health Education

Muscle dysmorphia is an obsessive disorder where an individual perceives him or herself as not being muscular enough. Participants of this study consist of adolescent males in grades 6 through 12 in a Midwestern school district. The aim of this study is to identify if there is a specific age group and/or sport/s that muscle dysmorphia is seen in most. Participants will be given the Muscle Dysmorphia Disorder Inventory (MDDI) questionnaire and the Eating Attitude Survey (EAT Survey). The purpose of this study is to aid educators and parents in teaching muscle dysmorphia prevention and coping strategies to students in junior high schools and high schools. It is hypothesized that individuals,

predominately those in high school, involved in sports will experience higher occurrences of muscle dysmorphia and disordered eating patterns than those who do not play sports and attend junior high school.

U.7 Comparison of Effect on Performance between PowerFlex® Taping System and Traditional White Athletic Tape in Prophylactic Ankle Taping

Emily Franz, Ashley Luedke
Advisor: Kari Emineth, MS, ATC, LAT, Athletic Training

Ankle injuries are some of the most common in athletics, with the majority of these being sprains. Traditionally, white athletic tape has been used for the purpose of prophylactic ankle taping; however, previous research has shown this type of tape to lose restrictive qualities with physical activity. Recently, a self-adherent tape was developed by Andover Healthcare Inc. to restrict range of motion regardless of exercise. The objective of this particular study is to determine if there is a difference in athletic performance between this self-adherent tape (PowerFlex®) and white athletic tape when used for prophylactic ankle taping. Subjects were selected from the general population of students at UW-La Crosse, and restricted to no history of lower body injury in the past 2 years. Each participant performed a set of 3 timed T-tests per day in a randomized order with each tape condition: no tape, white athletic tape, and PowerFlex® tape on 3 separate days. Tape was applied bilaterally with a closed-basket weave technique. Subjects were allowed a warm-up prior to taping and a 2 minute rest period between T-test trials. A repeated measure ANOVA was done to determine if there were significant differences in the mean T-test times for the 3 conditions. There is not enough evidence to suggest a difference in the tapes at the .05 significance level (p-value is .191), nor is there any effect by either tape on performance compared to the control. Therefore, we cannot determine from this study if ankle taping affects performance, regardless of material used. The goal of this study was to aid clinicians in choosing the appropriate taping materials which do not impede performance when prophylactic ankle taping is deemed necessary. Although our data was inconclusive, we hope this study can serve as a model for future research.

U.8 Impact of Corruption on GDP Per Capita

Raven Goebel
Advisor: Nabamita Dutta, Ph.D., Economics

Corruption has been shown to have negative effects on a country. The purpose of this research is to determine whether or not corruption has a significant negative impact on GDP per capita. Two different countries in the Sub-Saharan Africa region were compared: the Democratic Republic of the Congo and Botswana. These countries were chosen as they are on opposite sides of the GDP per capita spectrum. The Democratic Republic of the Congo has a significantly lower GDP per capita than Botswana. The objective was to examine the degree to which corruption impacted each country's GDP over a period from 2002-2012.

U.9 Warning Students about Test Difficulty: Effects on Self-Efficacy and Performance

Jenna Halvorson, Chloe Peebles
Advisor: Katherine Kortenkamp, Ph.D., Psychology

The proposed study will examine the relationship between perceived task difficulty, performance, and self-efficacy. Past research has individually examined the roles of perceived difficulty and self-efficacy in relation to task performance. However, research has not looked at self-efficacy as a mediator between perceived task difficulty and performance. Ninety undergraduate students will be led to believe one of the randomly assigned difficulty conditions of the task (difficult, easy, and neutral) and be instructed to complete three medium-level Sudokus. Self-efficacy will be measured by a pretest and posttest survey, and be compared to the participant's performance on the Sudokus. We hypothesize that when participants are led to believe a task will be difficult, their self-efficacy will decrease and their performance will be affected. By conducting this study, the importance of self-efficacy in relation to school performance can increasingly be shown.

U.10 When Water Cooler Talk Becomes Counterproductive: Friendship Behaviors at Work

Ashley Hanke
Advisor: Nicole Gullekson, Ph.D., Business

Friendships at work have been linked to increased job satisfaction; however recent research suggests friendships can also hurt job satisfaction. Decreased job satisfaction has been known to increase absenteeism and turnover. This study used a dual tension scale to measure potential conflict between friendships at work ultimately leading to decreased job satisfaction. Other variables measured were dispositional affectivity, friendship maintenance, turnover intention, and job satisfaction from a sample of workers from various businesses. A unique feature of this study is the adaption of a friendship maintenance scale to the workplace. This research will help employers understand why some friendships are increasing job satisfaction and others are causing conflict amongst employees. Results indicate that as friendship maintenance increased dual tension decreased suggesting that, contrary to some research, close relationships at work may be beneficial.

U.11 The Effects of an At-Risk Label on the Attribution of Student Behavior

Olivia Hartwick, Kathleen Kubisiak
Advisor: Tesia Marshik, Ph.D., Psychology

This study explored the effect of labeling on attributions of “at-risk” and “college-bound” student behaviors. All participants were asked to read a profile of an individual prior to observing them in a video. College participants were randomly assigned to one of three conditions where the target individual was described as “at-risk”, “college bound”, or an unlabeled target. Data was also collected from actual at-risk high school students. These participants only received the profile of the “at-risk” individual, due to limited availability of the high school student participants. After reading the profile, all participants watched three brief videos depicting the target individual: cheating on a test, not helping a student pick up books they dropped in the hallway, and receiving a poor grade on an assignment. After each video, participants were asked to complete an edited version of the Revised Causal Dimension Scale (McAuley, Duncan & Russell, 1992) and describe the possible causes of the individual’s behavior. In order to compare scores between the three student label conditions, we ran three one-way between-participant ANOVAs which showed that participants in both the “at-risk” and “college-bound” conditions made more external attributions about the causes of the behaviors than the participants in the “unlabeled” condition. Qualitatively, it was found that these external attributions differed depending on whether the participant was in the “at-risk” or “college-bound” condition. Regardless of academic label condition, participants were more likely to give internal attributions when describing the cause behind all three behaviors. By conducting an independent t-test, we were able find that high school at-risk participants were more likely to report the cause of the various behaviors as being more stable than the college participants in the “at-risk” condition, possibly identifying the presence of a deviant identity. McAuley, E., Duncan, T. E., & Russell, D. W. (1992). Measuring causal attributions: The revised Causal Dimension Scale (CDSII).Personality And Social Psychology Bulletin, 18(5), 566-573. Doi: 10.1177/0146167292185006

U.12 Prevalence of Brood Parasites in the Ostracods, Skogsbergia spp. and Photeros annecohenae, in Grassbeds Surrounding South Water Caye, Belize

Jessica Kallas, Alexandra Clussman
Advisor: Gretchen Gerrish, Ph.D., Biology

Evolutions of life histories (life span, number of offspring etc.) are often driven by the major source of mortality that a species faces. Some groups of ostracods in the Caribbean use bioluminescence as a defense against visual predators and predation attempts are rarely observed in the field during ostracods’ bioluminescent courtship displays. Instead of predation, we hypothesize that a major source of mortality for these marine ostracods is an undescribed brood parasite that infects female ostracods, consuming eggs while they are still in her brood chamber. The impact of these brood parasites on ostracod populations is still unknown. In order to estimate the prevalence of this parasite, four grass beds locations off of South Water Caye, Belize were sampled to compare the prevalence of brood parasites found in the bioluminescent species, Photeros annecohenae, to the prevalence found in the common non-bioluminescent species, Skogsbergia spp. We hypothesized that P. annecohenae would have a lower prevalence of infection than Skogsbergia spp. due to a possible defense mechanism associated with their bioluminescent capabilities. Also, we proposed that the prevalence of infection would be host density dependent. We found that Skogsbergia spp. had a high prevalence of the

parasite compared to a low prevalence in P. annecohenae. The mechanism of infection by the parasite and how defense in the ostracods impacts prevalence remains a mystery and warrants continued investigation.

U.13 Freedom vs. Tyranny: A look at the Development of the Post-Soviet Republics

Josh Gran, Lucas Lampert, Mitch Reiser
Advisor: Nabamita Dutta, Ph.D., Economics

At the collapse of the Soviet Union fifteen independent states were formed. By examining the differences in economic freedom, media freedom, and levels of corruption of these states, we will be able to predict the effect these factors have on developing nations. Two of the countries we will be focusing on include Estonia and Tajikistan. These two countries have the greatest disparity of wealth among the former Soviet Republics. Estonia's GDP per capita comes in at nearly $17,000 while Tajikistan's hovers below $1900. We want to examine why there is such great disparity in metrics such as GDP per capita, levels of trade, and level of health between the former republics. All of the republics stemmed from identical backgrounds but not all of them have realized the same prosperity. Our initial hypothesis is that some countries prospered much more than others largely due to the fact that these countries adopted a much more free economic system, as well as media system, than those who did not prosper. Such as is the case between Estonia and Tajikistan.

U.14 A Stratigraphical Analysis of the Tremaine Site: Erosional Processes Preserving Oneota Remains

Spencer Kawell
Advisor: Colin Belby, Ph.D., Geography

The Tremaine archaeological site is located south of Holmen, Wisconsin and has been excavated the past three years by the University of Wisconsin – La Crosse. The site is located on a dune covered Late-Wisconsin age Mississippi River terrace. Research conducted at the Tremaine site has been oriented towards understanding its Oneota component; however, highly disturbed archaeological remains recovered from the site have limited interpretation. Stratigraphic mixing of soils at the site has been caused by agricultural tilling that has disturbed up to 40 cm of topsoil. It has been proposed to excavate within interdunal low-lying areas where "localized erosion and re-deposition patterns may have helped to preserve [archaeological] remains" (O'Gorman 1995: 3). This research tests whether colluvium deposits exist in these low-lying areas, and if they are sufficiently thick to protect archaeological remains from tilling. Delineating these regions for excavation involved the extraction of cores from two dune-traversing transects that converged adjacent to current excavations. These cores were sampled at 4 cm intervals and analyzed for percent soil moisture; percent soil organic matter and particle size analyses. The intent of these tests was to elucidate trends in the soil, and make clear any colluvium deposits that may exist. Elevated percent soil moisture and organic matter were found exclusively at the base of both dunes. Furthermore, lower than expected values are found on dune crests and at distant sites in the low-lying interdunal region. Such patterns support erosional processes developing colluvium deposits in the low-lying areas. MATLAB produced scatterplots for these tests additionally depict such deposits potentially reaching depths sufficient enough to protect any archaeological remains underlying or within them.

U.15 Effects of Isoprenaline Injection on Ground Squirrel and Rat Myocardial Ischemia

Jenna Kerr
Advisor: Scott Cooper, Ph.D., Biology

Thirteen-lined ground squirrels portray fascinating physiological responses during hibernation. They have an extremely low heart rate (3-5 beats per minute) during hibernation which should cause myocardial ischemia. To measure this ischemic damage, hearts were harvested from ground squirrels at different stages in their annual cycle. Damage to tissues was analyzed microscopically, and quantified based on an ischemic damage scale. Results showed that while squirrels portrayed myocardial ischemia during hibernation, this damage disappeared after the squirrels arose from hibernation. One explanation is that squirrels are resistant to heart damage when faced with the low oxygen environment during hibernation. The purpose of this research project is to determine if ground squirrels are more resistant to heart damage than rats, and if the hibernating ground squirrels are more resistant to heart damage than non-hibernating squirrels. Myocardial infarctions or heart attacks are currently being induced in ground squirrels and rats by injecting isoprenaline (4mg/kg) intraperitoneally. Blood samples are collected at time points post-injection to look for circulating markers of a heart attack. After 48 hours the hearts are harvested, fixed, processed, sectioned, and stained for

ischemic markers. Overall, the results of this research have shown that the myocardial ischemic damage in hibernating ground squirrels is being reversed after the animals arouse from hibernation. The level of damage that the squirrel hearts undergo appears to be a level of which would lead to a heart attack in humans. Inducing an MI in both squirrels and rats will give us a better idea of the level of heart damage resistance, if any, that these rodents face. Comprehensively, results that are obtained from this study could potentially be used to find treatments for human heart damage and strokes.

U.16 "I think you did it...” Eyewitness Testimony and the Effects of False Memories

Katie Knapp, Katie Majerus
Advisor: Bianca Basten, Ph.D., Psychology

Seventy percent of the 297 cases that were overturned due to DNA evidence in the United States involved defendants who were first convicted because of eyewitness testimonies (Starr, 2012). This shows that there are flaws in eyewitness testimony and our purpose is to examine possible causes or contributors. Participants in past research showed the highest level of suggestibility when they were given multiple-choice questions that did not include the correct choice (Luna & Martín-Luengo, 2012). Other studies showed that when the participants were read misinformation about an event, 15% of them mixed up what they heard and what they actually saw (Manning & Loftus, 1996). For the current study, participants will be shown a video of a crime and will answer 15 questions about the event to establish a baseline rate of accuracy (Time 1). Two days later, participants will either view a newscast video of the event or will answer the same 15 questions about the event. In both the newscast video and the questionnaire, participants received leading correct and leading incorrect information (i.e., misinformation) about the event. Another five days later, all participants answered the same 15 questions (without misleading information) to see what they remembered from the video and to what extent the leading correct and leading incorrect information influenced their recollection of the event (Time 2). Preliminary results (n = 33) indicate that participants were influenced by both leading correct and leading incorrect information. That is, responses at Time 1 were more accurate for questions with leading correct information and less accurate for questions with leading incorrect information when compared to neutral questions. Preliminary results also indicated that the effect of leading information persisted over time. Preliminary results did not show any significant differences between the newscast video group and the misleading questionnaire group.

U.17 Synthesis and Structural Studies of (2-halobiphenyl) Chromium Tricarbonyl

Alex Korger
Advisor: Curtis Czerwinksi, Ph.D., Chemistry

In organometallic chemistry, a haptotropic rearrangement involves the movement of a metal between two rings that are bonded to each other within the same molecule. Haptotropic rearrangement reactions have potential applications in nanotechnology, where they could be used in the development of molecular devices, molecular wires, and molecular switches. Previously, our research group showed that a Cr (CO)3 group that is coordinated to the unsubstituted electron-neutral ring of an aminobiphenyl ligand can migrate to the amino-substituted electron-rich ring upon heating. It was shown that both steric effects and the electron-donating character of the amino group facilitated the observed rearrangement. We have recently extended this work to a series of halogen-substituted analogs, to explore how the size and the electronic nature of the halogen substituent accelerate or inhibit the rate of haptotropic rearrangement. In this presentation, we describe methods used in synthesis of (2-X-biphenyl) Cr(CO)3 where X= F, Cl, Br, and I. Synthetic methods have included Suzuki coupling, kinetic control, and diazonium ion formation. Nuclear magnetic resonance (NMR) spectroscopy was used to characterize the compounds and measure rates of haptotropic rearrangements. Single-crystal X-ray crystallography and density functional theory (DFT) were used to examine the role of steric hindrance. In the unsubstituted (biphenyl)Cr(CO)3, the arene-arene dihedral angle is 22°. A halogen substituted at the ortho position introduces steric hindrance that leads to dihedral angle of approximately 55°. Surprisingly, changes in halogen size seem to cause little difference in observed dihedral angles.

U.18 A Comparison of In-shoe Plantar Loading Variables between Rearfoot and Forefoot Strike Patterns in Running

Sydnie Kraus
Advisor: Thomas Kernozek, Ph.D., FACSM, Physical Therapy

Most runners are labeled as rearfoot strikers (RFS), meaning the heel of their foot contacts the ground first, as opposed to the forefoot strikers (FFS), where the forefoot makes contact with the ground first. Using a RFS pattern, the runner's foot usually lands in front of the knee and hip, with a relatively extended knee. In opposition, a FFS runner will land with a more flexed knee. Injuries, from repetitive stress, have been reported to be more common in RFS. This study aims to compare in-shoe plantar loading variables between RFS and FFS during running. The Pedar-X pressure sensing insoles were used to obtain in-shoe loading variables of 10 participants in multiple regions of the foot. In general, RFS displayed larger heel loads while FFS displayed greater loading in the forefoot region. One should consider using an accommodation period if altering foot strike patterns in running.

U.19 The Effects of Fibrinolysis in Hibernating 13-lined Ground Squirrels

Brittany Lehrer
Advisor: Scott Cooper, Ph.D., Biology

Deep vein thrombosis is a medical condition that can be lethal in humans and is becoming more common each year. Deep vein thrombosis occurs when a clot forms under low blood flow conditions and then moves from a large vein into the heart or lungs causing irreversible tissue damage. Hibernating 13-lined ground squirrels (Ictidomys tridecemlineatus) should be at risk of forming deep vein thrombi, because of their low heart rate of 3-5 beats per minute. In addition, each spring they must raise their body temperature from roughly six to 37 degrees Celsius and increase their breathing and heart rates in order to become active which could also induce blood clotting. Clinically, deep vein thrombi are diagnosed by looking for fibrin degradation products formed when the clot is broken down. In order to see if clots formed due to the lowered heart rate and blood flow during hibernation, an immunoblot using an antibody against fibrinogen was run on plasma samples of the 13-lined ground squirrels at different stages of the hibernation cycle. Fibrin degradation products, small proteins present after a clot breakdown, will be identified by their molecular weights. If degradation products are found, this would provide evidence that clots had formed, and the squirrels were able to reverse the ischemic tissue damage. Further studies could then be performed in order to find a way to reverse similar tissue damage in humans due to deep vein thrombosis. If degradation products are not found, it would suggest that deep vein thrombosis did not occur.

U.20 Effects of Stress on Urocortins Expression in the Rat Stomach

Chee Lor
Advisor: Sumei Liu, Ph.D., Biology and Scott Cooper, Ph.D., Biology

Stress profoundly influences gut function. Physical and psychological stressors inhibit gastric motility and emptying, which makes one feel full and bloated after eating. Corticotropin-releasing factor (CRF) has been implicated in stress-evoked inhibition of gastric emptying by activating the CRF2 receptors in the brain and in the stomach. It is becoming increasingly evident that urocortins (Ucn 1, Ucn 2, and Ucn 3), members of the CRF family of neuropeptides, are involved in stress-evoked gastrointestinal function changes. Previous studies found that stress elevates CRF mRNA levels in the brain regions involved in regulation of gastric function (Laurache et al., 2009) and in the stomach (Liu et al., 2012). However, CRF has a much weaker affinity for the CRF2 receptors compared to the three types of Ucns. The purpose of this project is to determine whether stress also up regulates Ucn1, Ucn2, and Ucn3 expression in the rat stomach. Male adult Sprague Dawley rats were placed under restraint stress for 1 hour. Controls were allowed to move freely in their cages without restraint. Rats were then euthanized at different time points (immediately, 4 hours, 8 hours, and 24 hours) after stress. The stomach was removed and stored at -80°C. By using quantitative RT-PCR, the expression levels of Ucn1, Ucn2, and Ucn3 will be measured in the rat stomachs. We hypothesize that stress will up regulate Ucn1, Ucn2, and Ucn3 mRNA expression in the rat stomach. Higher levels of urocortins will act on the CRF2 receptors in the stomach to slow down gastric emptying. These results are expected to provide evidence for the importance of Ucn 1, Ucn 2, and Ucn 3 in the regulation of gastrointestinal motor function in stressful events. Understanding this process will provide insight to how the negative effects caused by stress can be controlled.

U.21 Identity and Social Organization in the Nasca Valley, Peru

Emily Lovison
Advisor: Timothy McAndrews, Ph.D., Sociology and Archaeology

Early excavators within the Nasca valley of southern Peru perceived the large and impressive site of Cahuachi as the ceremonial urban center for the valley and surrounding areas. Recent excavations, however, have shown that Cahuachi was actually vacant most of the year. It was only occupied periodically by local elites during certain ritual phases. By looking at habitation settlements around the valley corresponding to the rise of Cahuachi and comparing them to mound constructions, and related geoglyphs, I hope to distinguish different communities who held power during this time period. I would like to determine which communities grew with and because of, the connections they held with the ceremonial center, and see if they decreased in prestige at the same time Cahuachi's influence over the area declined. This will help explicate power structures during the formation of chiefdom societies in Peru.

U.22 The Effects of Unilateral Hand Clenching and Emotion on Memory

Brooke Matheus
Advisor: Katherine Kortenkamp, Ph.D., Psychology

Research has found connections between unilateral hand clenching and episodic memory (McGraw, Brunye, & Weiss, 2013). Clenching one hand increases blood flow in the opposite hemisphere of the brain, and the memory processes of encoding and retrieval have been associated with different hemispheres of the brain (Habib, Nyberg, & Tulving, 2003). McGraw et. al. (2013) found that right hand clenching (left hemispheric activation) before the encoding of information and left hand clenching (right hemispheric activation) before retrieval of information leads to superior word recall. The present study is an attempt to replicate this finding and also investigate how emotional words and hand clenching affect memory. Research on the neuroscience of emotion suggests that right hemispheric activation facilitates withdrawal emotions such as sadness, whereas left hemispheric activation facilitates approach emotions such as happiness (Davidson, 2002). The current study was intended to expand on this research by looking at how memory would be affected by unilateral hand clenching when emotional words were being memorized. I hypothesized that participants in a right hand clenching encoding and left hand clenching recall condition would have superior memory capabilities. Furthermore, I hypothesized that participants in a right hand clenching condition would recall more positive emotional words, whereas participants in a left hand clenching condition would recall more negative emotional words. Participants, assigned to one of five conditions, viewed a timed PowerPoint that instructed them to squeeze a ball for two forty-five second sessions in either the left or right hand depending on the condition. Participants read a list of thirty-six words (twelve positive, twelve negative, and twelve neutral) in one of two random orders and after reading the words they squeezed the ball again for the same amount of time. They then recalled as many words as possible. A control group did the same memory task but without any hand clenching. While preliminary analyses indicated there were some encouraging trends in the predicted direction, ultimately the hypothesis was not supported. However, other trends have been evaluated and will be presented.

U.23 Oneota Pottery in the LaCrosse Region: The Tremaine Site

Mackenzie Miller
Advisor: Constance Arzigain, Ph.D., Sociology and Archaeology

Pottery can play an important part in dating an archaeological site since the motifs and other attributes are often specific to time periods. Based on radiocarbon dates and visual changes over time including those on pottery, there are three time phases that have been established. They are the Brice Prairie phase from 1300-1400 AD, Pammel Creek phase lasting 1400-1500 AD, and Valley View phase from 1500-1625 AD (Boszhardt 1993). From single occupation sites representing the three phases, statistical data had been collected to establish the size and location of the lip notches, position of the handle, and size of the rim. Analysis of the Tremaine site ceramics resulting from excavations by the University of Wisconsin-La Crosse from 2011 to 2013 was undertaken to identify the time span of occupation. Metric and non-metric data was collected from diagnostic sherds excavated to see how the data fits within previously determined categories, and if refinements in the chronology can be indicated.

U.24 Isolation of Anaerobic Bacteria from the Intestinal Tract of Arion fasciatus

Sarah Werner
Advisor: Bonita Bratina, Ph.D., Microbiology

Arion fasciatus is an invasive slug species that typically lives exclusively in terrestrial environments. Some populations, however, have been found in Wisconsin and Minnesota that live in streams. When fecal smears from these slugs were viewed microscopically, many unusually shaped microbes were observed. The goal of this research project was to isolate strict anaerobic or novel bacteria from the intestinal tract of Arion fasciatus. Several methods were used to better capture more of the bacterial diversity found in the slug guts, including: dissecting the slugs at various times after being removed from the streams, using several different growth media and gelling agents, and testing a variety of carbon and energy sources and growth factors. It was found that incubating the slugs for at least 24 hours prior to dissection decreased the diversity of colonies observed, however it also decreased fungal growth. Changing the gelling agent also affected the diversity of colonies observed, but unexpectedly the gelling agents had a differential effect with the delayed dissection protocol. The gelling agents that had a decrease in fungal growth are being used to solidify media in this experiment. A number of carbon and energy sources and growth factors were tested in various combinations and concentrations. Direct microscopic counts showed that some combinations resulted in measurable growth, whereas others resulted in very little or no growth. The best combinations are being used in solidified media to isolate bacteria. Once isolated, the 16S rRNA gene will be sequenced to provide identification. Isolating and identifying anaerobes present in the intestinal tract can potentially provide greater insight into host-bacterial relationships in Arion fasciatus.

U.25 Discovering the Perceptions and Importance of Physical Attractiveness among College Students

Linh Nguyen
Advisor: Carol Miller, Ph.D., Sociology and Archaeology

A study conducted at the University of Wisconsin-La Crosse will describe and examine the attitudes and perceptions of college students about self-esteem, attractiveness and the importance of physical attractiveness in relationships. Through intensive interviewing, a convenience sample of six females and six males will be asked a series of semi-structured questions about their past and current relationship status, self-esteem, and what qualities they find most attractive or ideal in a romantic partner. The purpose of this study is to discover any patterns in what college-aged students find attractive and if physical attractiveness is important in forming romantic relationships. Differences in answers based on self-esteem and gender will also be examined. This study triangulates with a quantitative study, conducted by the same researcher that used a survey to analyze the relationship between self-esteem and the evaluation of physical attractiveness of oneself and others. Future research on this subject include discovering what factors may influence an individual's perception of attractiveness, such as media or social pressures.

U.26 A Comparison of Genetic Divergence between Reef-dwelling and Grass bed-dwelling Marine Bioluminescent Ostracods

Christina Olbrantz
Advisor: Gretchen Gerrish, Ph.D., Biology

Bioluminescent ostracods can be found in oceans all over the world. These benthic organisms primarily use their luminescence as protection from predation. Only in the Caribbean do male ostracods use their luminescence in species-specific courtship displays. Males enter the water column to begin their displays after the sun has set on a dark night and they cue off of one another to produce a dynamic and awe-inspiring light show. Over coral patches, 6-8 species of ostracod are regularly observed displaying simultaneously, however only one species is found in the adjacent grass bed habitat. While the grass bed-dwelling Photeros annecohenae shows significant population level genetic divergence across a 12 kilometer stretch of continuous grass bed habitat, no obvious morphological or bioluminescent display differences are evident. However, in the coral-dwelling Photeros morini, we documented morphological and display differences between populations residing on the fore reef vs. patch reef habitats separated by less than 3 kilometers. Microsatellite markers were developed to determine the level of genetic divergence in Photeros morini. The microsatellite markers were tested across fore reef vs. patch reef populations of P. morini to determine if DNA divergence reflects the phenotypic and behavioral differences observed. Comparison of divergence within P. morini populations with those observed for P. annecohenae will hopefully shed light on how habitat specialization influences genetic divergence within bioluminescent ostracods.

U.27 Assessing Stress Responses of the Tropical Coral, Siderastrea Radians, to Simulated Parrotfish Feeding in a Belizean Reef Ecosystem

Hayley Powers, Kyle Phillips
Advisor: Gregory Sandland, Ph.D., Biology

Assessing coral health can provide insight into the overall stability of reef ecosystems. Parrotfish, which are abundant throughout Caribbean reefs, prey exclusively on hard coral polyps and their underlying tissue. This may damage coral colonies leading to altered dynamics within these tropical reef ecosystems. Given that very little is known about coral responses to predatory attacks, we examined localized response in Lesser Starlet Coral (Siderastrea radians) after exposure to simulated parrotfish feeding. To assess polyp response to different levels of predation, we exposed corals to three treatments: untouched (control), brushed, and scraped. We then measured coral response by estimating tentacle extension and mouth position. Results showed that simulated predation resulted in both polyp retraction and mouth closing. This was seen not only at the site of the predation event, but also in polyps adjacent to the damaged area. Furthermore, the time that it took for the polyps to recover from such a disturbance extended well over two hours. Although the long-term effects of repeated predation are unknown, our findings indicate that parrotfish predation may have a negative impact on the coral. This is one of the first studies to analyze the stress response of coral due to feeding and results suggest that parrotfish feeding may have important consequences not only for coral colonies, but the reef community at large.

U.28 Pulsed EPR Distance Measurements Resolve the Impact of Site-specific Calmodulin Methionine Oxidation

Michael Olenek
Advisor: Jennifer Klein, Ph.D., Biology

We have examined the structural impact of oxidizing specific protein methionines (Met) in the C-ter lobe of calmodulin (CaM); these oxidation sites are known to abolish CaM regulation of the major calcium release channel, the ryanodine receptor complex (RyR). Protein oxidation by reactive oxygen species (ROS) is strongly associated with loss of strength in skeletal muscle and is proposed to play major roles in aging and degenerative muscle disease. We have linked oxidation-induced changes in RyR regulation to changes in CaM-RyR structure using (1) protein mutagenesis to mimic oxidation at specific sites and (2) spectroscopy to resolve oxidation-induced changes in protein structural dynamics. Pulsed EPR distance measurements across CaM's lobes (multiple pairs of labeling sites, one label on each lobe) were sensitive to large-scale conformational changes that accompany both calcium binding and RyR peptide binding. In the absence of calcium, CaM was highly disordered, populating a broad distribution of conformations. Calcium binding strongly stabilized the elongated conformation, while RyR peptide binding to calcium-loaded CaM strongly stabilized the compact conformation. CaM conformation, particularly the distribution over structural states, was sensitive to Met to Gln substitutions (M109Q and M124Q) designed to mimic CaM Met oxidation. Structural sensitivity to M-to-Q mutations was observed in both the presence and absence of calcium, and in complex with RyR peptide. We conclude that Met oxidation alters CaM's functional interaction with RyR through changes in the orientation and flexibility of CaM's lobes.

U.29 Judgments of Intentionality: The Influence of Desire, Belief, and Skill

Alyssa Reeves
Advisor: Alexander O'Brien, Ph.D., Psychology

When interpreting others' actions, an observer's construal of an event relies heavily on judgments of intentionality. These judgments serve as a guide to explain others' behaviors. Previous research suggests that there are 5 critical components in judgments of intentionality: "the agent's desire for an outcome, beliefs about the action leading to the outcome, the intention to perform the action, awareness of the act while performing it, and a sufficient degree of skill to reliably perform the action" (Malle & Knobe, 1997). Malle & Knobe (1997) also argue that all 5 components need to be present--without all 5 components, individuals rarely regard an action as intentional. The current study will present participants with hypothetical vignettes of human behavior. Subsequently, the influence of skill, belief, and desire will be examined, as well as how each of these components impact judgments of intentionality. It is predicted the results will indicate that not all 5 components are necessary, and the strongest indication of intentionality will be desire.

U.30 The Effect of Eliminating the Stress CT and Reduction of Reference mAs for Rest-Stress SPECT/CT MPI on Patient Radiation Exposure

Amy Bell, Carlyn Johnson, and Mariah Root
Advisor: Carlyn Johnson, Ministry St. Joseph's Hospital Nuclear Medicine Technology

Cardiac rest-stress myocardial perfusion imaging (MPI) is often performed using a SPECT/CT camera. Conventionally, a CT is taken of the patient's chest area during the rest study and then again during the stress study to allow for attenuation correction of the respective SPECT images. However, separate rest and stress CT scans incur a greater radiation dose to the patient. Reference mAs aids in determining the amount of radiation used during a CT scan, therefore a reduction in mAs could also affect patient radiation dose. The purpose of this research was to determine if the elimination of the stress CT image and a reduction in the reference mAs for patients undergoing a rest-stress MPI would have a noticeable impact on patient radiation dose and image quality. METHODS: Twenty patients who had undergone rest-stress MPI before and after the CT elimination and mAs reduction were evaluated using a SPECT/CT system (Siemens Symbia T). The reference mAs used in calculating the CARE Dose4D for CT imaging were reduced from 100 mAs to 90 mAs. CARE Dose4D is the automatic exposure control technique utilized by Siemens which allows for varying CT doses based on patient attenuation profiles. The images were then processed using the rest CT for coregistration on both rest and stress SPECT images and presented to two nuclear medicine physicians for a blind read. RESULTS: By eradicating the use of a second CT and lowering the reference mAs, patient radiation dose reduction ranged from 45-65%. The physicians felt that the image quality between the two sets of images were analogous. CONCLUSION: Patient radiation dose was decreased, on average, by 59% by eliminating the stress CT and reducing the reference mAs. The elimination and reduction still provided high quality images. A second CT may be recommended if a patient were severely overweight, in which soft tissue positioning could greatly change, therefore, attenuation correction would need to be specific to the individual at that time.

U.31 Muscles and Media: How Video Games Effects Male Self-perception and Body Image

Amber Schade, Ann Zenginidze
Advisor: Ryan McKelley, Ph.D., Psychology

Previous research shows that media has an influence on men's and women's self-perception and body image (Tiggeman & McGill, 2004). The effects of media on men's body perception is relatively underexplored despite the fact that male body dissatisfaction has increased from, 25% of men reported being dissatisfied with their bodies in 1972 to 67% in 1997 (Pope, Gruber, Mangweth, Bureau, deCol, Jouvent, & Hudson, 2000). Video games, a common type of media exposure for men, influence how men perceive themselves (Barlett & Harris, 2008). Video games increase participants' sense of presence and involvement, often time causing them to form a close connection to the character (Ivory & Kalyanaraman, 2007). The purpose of this study is to investigate how the muscularity of characters in video games and the drive for muscularity and masculinity affect self-perception and body dissatisfaction in men. Fifty participants will play either a video game with a muscular character or a video game with a more realistic character. They will be assessed using a number of questionnaires that measure their drive for muscularity, drive for masculinity, body dissatisfaction and self-perceptions. Using the computer program The Somatomorphic Matrix, participants will have the ability to adjust the muscularity and body fat percentages of men in line drawings. Men will be using this Matrix to answer questions about their body and the ideal body. This information will provide data to calculate the discrepancies between the perceptions. It is predicted that males who play the video games with the muscular character will be more likely to experience larger body-image distortion compared to the men who play a neutral video game. If our hypotheses are supported we will contribute to the growing research on video games and how they affect men's self-perception.

U.32 The McDowell Prairie: Land Snail Community Prior to Restoration of a Hill Prairie with Forest Encroachment

Brynn Sundberg, Dr. Kathryn Perez
Advisor: Kathryn Perez, Ph.D., Biology

The terrestrial snails of North America are a diverse and threatened group, but conservation status of the majority of species is uncertain. Hill prairies are an endangered habitat type in the Driftless region, a bio diverse region in MN, IA, and WI that was unglaciated during the last glacial maximum. Hill prairies (goat prairies) are characterized by their vegetative community and require occasional disturbance by fire to prevent overgrowth by forest vegetation. The

McDowell Hill Prairie had been invaded by cedar and other forest plants, but is in the midst of a restoration project. We were interested in the response of the land snail community to the restoration effort. We sampled the prairie site for 1 person/hour visually for macrosnails. In addition, we gathered leaf litter samples from throughout the prairie site for microsnails. Environmental data (slope, ground cover, vegetation, etc.) were taken at three points in the site. After being dried and sieved, the leaf litter was searched under a microscope and the microsnails were collected and identified. In this presentation we report the results of our initial survey of snails during the restoration effort. The land snail community from the McDowell Prairie will be compared to hill prairie, restored hill prairie, and forest sites from throughout the WI Driftless region.

U.33 The Search for Genes Involved in the Secretory Pathway of Chlamydomonas Reinhardtii

Kayleen Toellner, Molly McGuine
Advisor: Anton Sanderfoot, Ph.D., Biology

Plants affect every aspect of our lives. They provide us with food, clothing, shelter, and even help power our cars. Using the secretory pathway, plants interact with their environment by transporting proteins, wastes, chemical signals, and even antimicrobial agents in and out of their cells. The genes that encode this pathway are vastly different from the genes involved in the secretory pathway in humans. Our goal is to identify new genes that are responsible for the secretory pathway in plants by using a single celled, haploid algae Chlamydomonas reinhardtii. We will accomplish this by randomly mutating C. reinhardtii and screening for mutations that affect the secretory pathway. We will then use molecular biology techniques to identify the insertion site of the mutation and observe some of the genes responsible for the secretory pathway in this alga. These genes will help us understand more about the crucial secretory pathway in plants.

U.34 Utilization of the Pixon Method with Whole Body Bone Imaging

Clarissa Venzke, Abigail Grancorvitz, Carlyn Johnson
Advisor: Carlyn Johnson, Ministry St. Joseph's Hospital Nuclear Medicine Technology

At Ministry Saint Joseph's Hospital whole body (WB) bone scans are performed at a speed of 12 cm/min and typically take about 25 minutes, depending on the patient’s height. During that time, any patient movement could result in the patient needing to be rescanned. Utilization of a computer processing technique known as the Pixon Method (or Enhanced Planar Processing) could shorten the scan time for WB bone imaging by increasing the scan speed. However, this also means the image counts collected will be half the counts of a typical WB bone scan. The Pixon Method is designed to manipulate these half count images to make them appear equal in counts to a full time image. The purpose of this study was to determine if the Pixon Method would reduce a patient’s WB bone scan time while still providing high quality images. Methods: Using a SPECT/CT system (Siemens Symbia T), eight patients underwent two WB bone scans. The first scan, acquired with a table movement of 12 cm/min and processed utilizing traditional protocols, was followed by a second scan acquired at 24 cm/min which was processed using the Pixon Method. The images from both sets of scans were then presented to two nuclear medicine physicians for a blind read. Results: Of the eight studies analyzed and compared, the physicians found the two sets of images to be very similar in quality. Conclusion: It was determined that the Pixon Method was effective in reducing a patient's WB bone scan time while achieving comparable quality images. Utilization of this technology not only has the potential to increase patient satisfaction by reducing the amount of time the patient spends under the camera, but also increase patient throughput in the department.

U.35 Word Association and French Stereotypes

Shelby Wicklacz
Advisor: Katherine Kortenkamp, Ph.D., Psychology

Approximately 30% of the English language derives from French. In order to look at French stereotypes in an indirect manner, my research has participants trying to pick out words of French origin from a list of English vocabulary. I hypothesize that participants will choose words that align with existing stereotypes of French culture such as fashion, cuisine, etc. The intent is to unearth any possible stereotypes without inquiring directly.

U.36 Functional Group Modification for Optimization of Multifunctional Molecule-Based Materials

Megan Wimmer, Dr. Kendric Nelson
Advisor: Kendric Nelson, Ph.D., Chemistry

Technological advancements in the computer and electronic industries have been led by miniaturization of device components. However, there exists a limitation to the physical size reduction of these materials and an alternative to this 'top-down' approach is needed. Such alternatives may fall in the realm of molecule-based materials as the fabrication of these materials start with a 'bottom-up' approach. Molecules and/or molecular assemblies with desired chemical/physical properties serve as precursors towards these molecule-based materials. Implementation of these materials has the potential to revolutionize the computer and electronic industries and produce new/improved device components that may also exhibit multifunctionality (i.e. more than one function). We propose that organic bridging ligands with interesting electrochemical and luminescent properties (i.e. 9'-[4, 5-bis([alkyl/aryl]thio)-1,3-dithiole-2-ylidene]-4'5'-diazafluorene, R-Bridge) may be selectively coupled to various transition metal complexes (where metal = manganese, iron, cobalt, nickel, copper, zinc) with interesting magnetic/optical properties. The coupling of these molecules has the potential to marry their properties in a molecular assembly that can be utilized to produce multifunctional molecule-based materials. Characterization of these molecular precursors was performed via spectroscopic methods (i.e. NMR and IR) and analysis of magnetic, electrochemical, luminescent, and structural properties of these compounds is currently under investigation.

U.37 The Effect of Anterior Cruciate Ligament Reconstruction on Knee Kinetics and Kinematics during Clinical Hop Tests and Cutting Drills

Sarah Zahirudin
Advisor: Thomas Kernozek, Ph.D., FACSM, Physical Therapy

As the popularity of sports participation increases, so does the potential for sports related injuries among athletes. One of the most common and devastating injuries is the disruption of the anterior cruciate ligament (ACL) of the knee, with 250,000 to 300,000 injuries occurring in the United States annually. Due to its debilitating effects, 90% of cases choose surgical reconstruction succeeded by considerable clinical rehabilitation, commonly through physical therapy. The purpose of this study is to quantify and analyze the differences in kinematics and kinetics during average sports movements, such as the impact during single leg hopping, in the motion analysis laboratory. The study will focus on ACL reconstructed patients that have been cleared by a sports medicine specialist to return to full sports participation, compared with matched controls of athletes that have not sustained an ACL injury. The results may be used by sports medicine specialists and clinicians in order to make a more complete evaluation regarding an athlete's readiness to return to his or her sport with a reduced risk of reinjury

U.38 Does the Antimicrobial Agent, Triclosan, Impair Craniofacial Development?

Shayna Zalec
Advisor: Tisha King-Heiden, Ph.D., Biology

Triclosan (TCS), an antibacterial and antifungal agent found in several personal care products, is an emerging contaminant of concern. The toxicity of this compound is not well understood, and it is a suspected endocrine disruptor. Previous work done in our lab suggests that exposure to TCS during early stages of development impairs the development of some craniofacial structures. The objective of this experiment; therefore, is to take a more careful look at craniofacial structures following exposure to TCS. To complete this experiment, zebrafish embryos will be exposed to graded concentrations of TCS by static, waterborne exposure during early stages of embryonic development. Once fish have reached larval stages of development, we will stain craniofacial structures and use standard morphometric analyses to carefully evaluate craniofacial structures of the skull and jaw, and potential impacts on their ability to capture prey. This information will help us to better understand the toxicity of this emerging contaminant.

U.39 Martha Euphemia Lofton Haynes: A Leader in Integrated Education and the First African-American Woman to Receive a Doctorate in Mathematics

Carly Shinners, Katherine Zoroufy

Advisor: Susan Kelly, Ph.D., Mathematics

Dr. Martha Euphemia Lofton Haynes, the first African-American female to earn a doctorate in mathematics, was born on September 11th, 1890. Haynes earned a master's degree in education, with a master's thesis topic in mathematics education, from the University of Chicago in 1930 and later completed her doctoral work in mathematics at The Catholic University of America. Haynes went on to have a successful career that included serving as an educator in the public schools of Washington, D.C. and founding the mathematics department at Teachers College, which would eventually merge and become the University of the District of Columbia. After retirement, Haynes was asked to serve on the Board of Education for the D.C. school district where she would ultimately be elected the first female African-American president of the board. While Haynes was a member of the board, she played an instrumental role in desegregating D.C. public schools and worked to eliminate the tracking system, which tested and placed students in specified tracks for education. In particular, Haynes played a key role in the Hobson vs. Hansen case in 1967 by testifying in court and speaking out against Carl Hansen, the superintendent who developed the concept of tracking. Surprisingly, little has been written about this remarkable woman; however, Haynes did leave most of her papers and belongings from throughout her life to The Catholic University of America where they are now archived. This research presents findings, gathered from these archives, on her life and professional accomplishments. Our hope is to give Martha Euphemia Lofton Haynes the recognition she deserves and let her story inspire women and minorities to pursue mathematics.

U.40 What's Trending? Social Media and its Effects on Organizational Communication

Emily Langer
Advisor: Ronda Leahy, Ph.D., Organizational Communications

Previous research has shown how social media has become increasingly incorporated as a means of organizational communication with employees and the public within the last decade. Leonardi, Huysman, and Steinfield (2013) examined how the use of social media among employees affected the communicative activities through which work is accomplished. However, much of the research surrounding social media has marginalized the effect that the use of social media has had on organizational communication. The purpose of this study is to interpret how social media has increased, decreased, or maintained the success of a company through the effect it has had on organizational communication within an organization and with the public. The intended subject population for this research will include executives from companies that have implemented social media as a process of organizational communication. Interviews will be transcribed and interpreted in order to uncover emerging themes about the use of social media within an organization. Using Systems Theory as the framework for this study, an extension of research on social media use will provide information and interpretations that can be utilized to better adapt to the use of social media as a new method of communication that continues to grow within the corporate world.

U.41 Economic Development in Nicaragua

Shelby Cutler, Cody Nelson, and Meghan MacMillan
Advisor: Nabamita Dutta, Ph.D., Economics

The purpose of this research is to investigate or uncover the reasoning behind the economic stagnation of Nicaragua in comparison to its surrounding neighbors of Guatemala, Honduras, and Belize who were once economically inferior. It is important to view Nicaragua in comparison to its neighbors because they are all similar in geography, climate, and resources. This will be looked at from a multi-dimensional perspective, examining different variables which may affect the country's economic development and will be measured through GDP per capita, Foreign Direct Investment into the company, Human Capital, trade statistics and other important indices.

U.42 U.56 Grace Chisholm Young

Marissa Eckrote, Shelby Graham
Advisor: Susan Kelly, Ph.D., Mathematics

Dr. Grace Chisholm Young was the first woman to earn a Ph.D. from a German university, earning a doctorate in mathematics in 1895. Germany admitted women from outside its borders in advanced study prior to educating German

women in graduate work. Young studied under Dr. Felix Klein who played an instrumental role in bringing the first three females to Germany for graduate level studies. In her lifetime she authored and coauthored over two hundred papers on a wide array of topics in mathematics including set theory and differential calculus. She also wrote three books for children about mathematics and science. This poster will present both a sample of her contributions to mathematics and a study of her live in the context of the roles of women at that time. One goal of this research is to help bring awareness of the roles of women in mathematics.

U. 43 The Effects of Attentional Focus on Power Production during Bench Press

Jonathan Flinchum, Melanie Martin, Michael Schiller, Whitney Tetrault, Dr. Attila Kovacs
Advisor: Attila Kovacs, Ph.D., Exercise and Sport Science

Over the past decade a growing body of literature has demonstrated the benefits of an external focus of attention compared to an internal focus of attention during motor performance. While many studies focused on the effects of different attentional foci during skill acquisition, relatively few studies have been reported investigating these effects on skill performance using a well-learned task. Therefore, the purpose of this study was to compare muscle power production during a bench press task under different foci of attention conditions. Participants (n=16; age 18-22) were undergraduate students/athletes that have been regularly performing weightlifting activities two times a week, for a minimum of one year. Following a standardized warm-up, participants completed five repetitions of bench press at 45% load of their one repetition maximum (1RM) using a Smith machine. The task required participants to propel the barbell with weights as high and as fast as possible. Power output was assessed under three different conditions: external focusing instructions (EF) required to focus attention on the barbell and to try to propel it as high as possible; internal focusing instructions (IF) required to focus attention on contracting the pectoral muscles during the task; and no focusing (NF) condition in which participants did not receive any type of instruction. Data analysis, using repeated measures ANOVAs, indicated significant differences between conditions. Power production was significantly greater under the EF condition compared to the IF condition, while performances under IF and NF conditions were not different. Additionally, increased values of EGM-RMS were detected under EF conditions as compared with the IF and NF conditions. These findings might be considered when designing training protocols for athletes with the purpose of maximizing their power production.

U.44 The Children of Ba Vi: The Empowerment of Vietnamese Orphans with Disabilities through Dance

Eric Busse
Advisor: Beth Cherne, Ph.D., Theatre

This research was initiated on the foundation of previous research into the transformative power of artistic expression. “The Children of Ba Vi: The Empowerment of Vietnamese Orphans with Disabilities Through Dance” was successful in discovering how informal exercises based upon the practice of Dance/Movement Therapy could empower children living in a government run orphanage in the small town of Ba Vi, just outside of Hanoi. This research aimed to utilize knowledge gained from “Cardboard Citizens: Empowering the Homeless” which was successful in understand how Theatre of the Oppressed was empowering the homeless citizens of London, as well as “Ghana: Investigating the Arts and Fighting Modern Day Slavery” which articulated the ways in which traditional Ghanaian performance is being utilized to effectively combat child labor trafficking in Ghana. As a result, this research represents a body of work which has sought to understand the transformative power of theatre, dance and music across language, ethnicity and cultural divisions. This final installment involved the working intimately with the Ba Vi Disabled Children’s Orphanage, gathering research on non-clinical dance/movement exercises, implementing informal dance/movement experiences and gathering qualitative information regarding the efficacy of these experiences.

Poster Session B
Valhalla Hall: 11:00am-12:45pm

U.45 Societal Indicators and Human-Water Relationships

Laura Anderson
Advisor: Enilda Delgado, Ph.D., Sociology

Previous research has examined the relationship between countries values, social and cultural context with their environmental attitudes. Findings from these studies have demonstrated cross-cultural generalizability inferring countries with collectivist cultures and self-transcendent values are positively linked to environmental attitudes; specifically attitudes towards water practices. The current study intends to combine prior research on this relationship between values and environmental attitudes to determine if particular social or cultural indicators significantly impact a country's views towards water practices. Secondary data analysis is used to examine which social and cultural indicators have influenced the current human-water relationships in the following countries: the United States, India, Japan and Chile. These countries were chosen based on their political and religious affiliation. Findings from the World Values Survey are used as the foundation for this research's secondary data analysis. Keywords: environmental attitudes, water practices, values, social and cultural indicators, secondary data analysis, political and religious affiliation, World Values Survey.

U. 46 Business Efficiencies Impact on Foreign Direct Investment

Scott Gifford, Houng Nguyen, Jingru Guan
Advisor: Nabamita Dutta, Ph.D., Economics

The widespread of globalization has created the opportunity for a significant amount of supply and demand in foreign direct investment. However the institutions constructed and implemented in a country, are influential on the amount of foreign direct investments (FDI). This will be measured by analyzing low-income country's institutions quality and allowance of doing business, dealing with construction permits, and protecting investors. Thus a country's institutions inability to provide high rankings for these factors, affect the amount of FDI received. This can be portrayed by looking at the high FDI and high ranked ease of doing business variables of Mozambique. On the other hand, Guinea-Bissau receives low FDI and is ranked low on efficiently doing business.

U. 47 Skull Bone Densities in the Merlin and Great Horned Owl (Falco columbarius and Bubo virginianus) and their Relationship to Feeding Function

Lauren Schultz, Kari Mosbacher
Advisor: Eric Snively, Ph.D., Biology

The different eating habits of Merlins and Great Horned Owls suggest different skull adaptations. The Merlin pulls vigorously on its food, often to one side, while the Great Horned Owl swallows prey whole. Preliminary CT scans indicated asymmetrical densities of the Merlin skull, but lower, evenly distributed densities in the Great Horned Owl. This can be a result from killing their prey before it comes to their beaks, whereupon they swallow it whole or tear from the prey they previously damaged. We assessed densities in more detail to derive hypotheses of feeding function. HYPOTHESES: In simulations of the Great Horned Owl tugging on prey, we expect that there will be less stress, evenly distributed on the beak. In simulations of the Merlin tugging on prey, the stresses will be greater on the side where the bone is most dense. METHODS: OsiriX, a medical diagnostic program, was used to analyze CT scans and create 3D volume models of the Great Horned Owl and Merlin, to observe and compare different densities of their skull bones. Forces of tugging on the prey were input into the finite element analysis program, Strand7, in order to reveal and assess feeding stresses on the skull. RESULTS: Detailed Density Distribution: We found generally asymmetrical densities in the Merlin skull, with greater densities in the left premaxilla, parietal and nasal bones. In the homologous

bones, densities in the Great Horned Owl remained evenly distributed. Stress Distribution: The magnitudes of stress correlated with magnitudes of density in both the Merlin and the Great Horned Owl, but stresses were greater than expected in the Great Horned Owl. IMPLICATIONS: As predicted, the corresponding asymmetries of density and stress in the Merlin are consistent with feeding habits in the Merlin and other small falcons. Greater stress than expected in the Great Horned Owl is consistent with the owl rarely employing a forceful bite

U. 48 Computational Simulations Reveal How Calmodulin Methionine Oxidation Triggers Large-scale Changes in Structural Dynamics

Michael Olenek
Advisor: Jennifer Klein, Ph.D., Biology

We have examined the structural consequences of methionine (Met) oxidation in the calcium-sensing muscle regulatory protein calmodulin (CaM) using molecular dynamics simulations. Protein oxidation by reactive oxygen species (ROS), and subsequent reduction by the antioxidant enzyme methionine sulfoxide reductase, has emerged as a crucial cell regulatory mechanism. In the context of oxidative stress, protein oxidation is implicated in disease progression and biological aging. Our goal is to bridge our understanding of muscle dysfunction and protein oxidation with atomic-level insights into site-specific methionine oxidation and calmodulin structural dynamics. We have carried out multiple 50 ns molecular dynamics simulations of explicitly solvated calmodulin, starting from the calcium-bound (1cll) and apo (1cfd) structures. Simulations were performed using NAMD (University of Illinois) and theCHARMM27 force-field. Simulations suggest that Met oxidation alters the flexibility of calcium binding sites, the conformation of the linker helix connecting the lobes, and the relative orientation of the lobes. This work is a component of a larger study in which spectroscopic distance measurements and NMR experiments have been used to resolve the structural impact of site-specific CaM Met oxidation. We expect that our in silico results will bring atomic-level insight to spectroscopic measurements, and will be integral to creating a more complete model for oxidation-induced changes in CaM structural dynamics.

U.49 Investigating the Spatial Distributions of the Invasive Snail Bithynia tentaculata and the Infection Rates of Trematode Parasites it is Host to

Kyle Babich
Advisor: Gregory Sandland, Ph.D., Biology

Bithynia tentaculata is an invasive snail that has spread throughout much of Pool 7 and 8 the Upper Mississippi River (UMR). Its role as a host for waterfowl-killing trematode parasites such as Cyathocotyle bushiensis and Sphaeridiotrema species has resulted in annual mortality events in the UMR, primarily in Lesser Scaup and American Coot. Although B. tentaculata and its parasites are generating large disease outbreaks in this region, little is actually known about the spatial and temporal distributions of these snails and parasites. To address these shortcomings, I collected snails from a number of different sites along a rocky breakwater in Pool 8 of the UMR across 5 months. All collected snails were measured, sexed and then necropsied to assess parasite infection. Results demonstrate that snail densities and parasite intensities fluctuate both spatially and temporally at the site. How these patterns tie in with transmission to waterfowl hosts will be discussed.

U.50 Analyzing Late Prehistoric Oneota Sherds and Clay Sources by Using X-Ray Diffraction in the La Crosse Savanna Terrace Region

Terri Beal
Advisor: Constance Arzigian, Ph.D., Sociology and Archaelogy

The Oneota phase in the Upper Midwest 1300-1650 was marked by intensive agricultural production, but research has indicated that Oneota people incorporated some degree of mobility into their daily lives. At this time, the mobility is poorly understood, but pottery is one of the most common artifact types at Oneota sites. These shreds can contribute to an increased understanding of regional community associations and seasonality movement patterns through x-ray diffraction analysis of clay sources and finished potsherds as this analysis can tie finished vessels to the clay source used to make them. To aid in local and exotic clay sourcing in the La Crosse Savanna Terrace region; I am utilizing x-ray diffraction analysis on clays and archaeological remains found within this region and comparing them to exotic clays

and sherds from other regions. This research demonstrates that it is possible to determine local and exotic clay sources, and community seasonality movement patterns as well as ceramic manufacturer individuality by looking at clay crystalline structure and firing temperatures using x-ray diffraction.

U.51 Alcohol Consumption during Pregnancy in Rural Coastal Ecuador

Emma Brosinski
Advisor: Emily Whitney, Ph.D., MCHES, Health Education

Often, attention to implementing and planning women's health education projects is lacking, especially in developing countries, such as rural Ecuador. Lack of maternal health education, specifically on the serious effects of alcohol consumption during pregnancy, can have a great impact not only on the woman herself, but also on the family and community. This study will utilize observations, interviews, and surveys to gain an understanding of the knowledge, attitudes and behaviors that surround alcohol consumption by pregnant women in rural Ecuador. Upon completion of my study, I will have data that address the drinking habits of rural, pregnant women in Ecuador. Once I analyze the data, I will then determine whether a health education program or toolkit is needed to be implemented in the communities studied to address the problem.

U.52 Foam Rolling vs. Static Stretching: Increasing the Flexibility of the Iliotibial Band

Jerald Charles
Advisor: Kari Emineth, MS, ATC, LAT, Athletic Training

Limited range of motion can put stress on muscles and joints. This extra stress can lead to injury. The iliotibial (IT) band, a thick band of fascia of the tensor fascia latae muscle, can become taught, which can cause pain in the hip or knee due to a limited range of motion. Previous studies have not compared foam rolling and static stretching with increasing IT band flexibility. The purpose of this study was to determine whether foam rolling or static stretching improves flexibility of the IT band more. Twenty-four subjects were recruited from the general University of Wisconsin-La Crosse student population. Each subject was randomly placed into one of three groups. Each group performed a five minute jog to serve as a warm-up. To act as a control group, one group only performed the warm-up. The foam rolling group performed a series of rolling for 30 seconds for three sets on each leg in addition to the five minute jog. The static stretching performed the same series but with static stretching in addition to jogging. Each subject completed their protocol four times of week for four weeks. The degree of adduction was measured using the TiltMeter application for iPad, at the beginning and end of the study. An ANOVA statistical analysis was done with the averages from each group. The p-value of .737, is larger than the accepted α=.05, shows the data is statistically insignificant to show static stretching or foam rolling increases the flexibility of the IT band more than doing a 5 min jog. After doing this study it cannot be concluded that foam rolling increases flexibility more than static stretching. It is not warranted though to use one method over the other since one method is not significantly different in increasing range of motion.

U.53 Ecological Stoichiometry of Bithynia Tentaculata in the Mississippi River

Alexandra Clussman, Roger Haro, Gregory Sandland, Robert Monney, Christopher Glodosky
Advisor: Roger Haro, Ph.D., Biology

Bithynia tentaculata, an invasive aquatic snail, was first recorded in the Upper Mississippi River (UMR) in 2002. Bithynia tentaculata is the primary and secondary host of the parasitic species Cyathocotyle bushiensis and Sphaeridiotrema sp. Gastropods, such as B. tentaculata, are grazing herbivores that can have a substantial role in the cycling of nutrients in aquatic systems. Grazers directly alter the resource nutritional composition through their nutrient release, a characteristic of Consumer-driven nutrient recycling (CNR). My objective was to use stoichiometry, the mass balance between biologically important elements (carbon, nitrogen, and phosphorus) to determine how parasite infection affects nutrient recycling by B. tentaculata. Previous studies revealed that snails infected with parasites excreted a higher N:P content than unaffected snails, indicating that infected snails may be functionally different due to differential excretion. The elemental composition (molar C:N:P) of the snail's excretion (particulate and dissolved) and the somatic and reproductive tissues of infected and uninfected snails were measured. We hypothesized that there would be differences in nutritional composition of somatic and reproductive tissues and excretion between infected and uninfected B. tentaculata.

U.54 Evoking Criminal Stereotypes Based on Race and Gender

Laura Como, Carla Weber
Advisor: Grace Deason, Ph.D., Psychology

Research indicates that racism and racial stereotypes are major factors associated with racial biases in arrests, sentencing, and perceptions of guilt. Incarceration rates disproportionately impact Blacks compared to their White counterparts. Gender disparities also exist in the criminal justice system. The purpose of the current study is to observe how race and gender stereotypes jointly affect judgments of criminals and the severity of punishment. Study 1 focused on the racially stereotypic nature of eight crimes. Participants were asked to choose an individual out of a pool of different races and genders, whom they believe committed the crime. Study 2 will measure biases in sentencing length in response to the stereotypes uncovered in Study 1. Participants will receive a survey with the same eight crime scenarios from Study 1, paired with one of three conditions: a female perpetrator, a male perpetrator, or "picture not available" image. Participants will be asked to indicate the severity of punishment (length of sentence) they believe is typical for the crime based on the picture condition they received. We predict that underlying stereotypes will play a role in people's perceptions of the "typical" perpetrator associated with a specific crime, as well as the appropriate punishment for each perpetrator. Specifically, we expect that women will be more likely to be given lenient sentencing in comparison to men for similar crimes and White men will receive more lenient sentencing compared to Black men. Findings in support of our hypotheses will add to the growing body of literature on biases in the criminal justice system due to racial and gender stereotypes.

U.55 Performance: An International Study of Skill-Enhancing Theatre

Justin Cooke
Advisor: Beth Cherne, Ph.D., Theatre Arts

Educational theater stemmed out of the Industrial Revolution, originating in London and then spreading to the U.S. Its purpose was to emphasize creativity and artistic thinking in individuals when social emphasis was on money-making and industrial productivity. The intention of this project was to gain a comparative sum of knowledge as to how live performance in the theatre is being used as an educational tool today, in a technological-dependent world, in order to disconnect youth from technology and broaden their social and cognitive skills. I compared two theatre companies that focus primarily on producing educational theatre for youth, London's Sell-A-Door Theatre Company and the Children's Theatre Company in Minneapolis, so as to understand how educational theatre was being used two hundred years after its origination in its originating countries. I traveled to London and attended a performance of Seussical the Musical, an American musical adaptation of various Dr. Seuss stories, to learn how Sell-A-Door produced theater intended for children. I compared the production to various Children's Theatre Company productions that I have seen in previous years, and I found that both companies are similar in how they produce theater for youth. Both companies engaged audiences through audience interaction and spectacle, and introduced both familiar and unfamiliar content in order to expand cultural understanding through dramatic works. Additionally, both companies offer similar acting workshops and classes that allow youth to personally explore performance in the theatre. This project found that the originating countries of educational theatre are still using it two hundred years later for a similar purpose: to inspire creativity and artistic thinking to understand the world. In today's technologically advanced world, educational theater is used to disconnect youth from technology and, through performance, broaden their social and cognitive skills and reconnect them to each other.

U. 56 Geometric Reasoning in PK-2

Rebecca Keene, Stephanie Schott
Advisor: Jenni McCool, Ph.D., and Jennifer Kosiak, Ph.D., Mathematics

This study focuses on how primary students reason and communicate about shapes and to determine the impact of instructional activities on student understanding. Students are exposed to a wide variety of geometric concepts PK-2. Research shows students often have a narrow view of the attributes that define shapes (Clements & Sarama, 2009). Our study investigates how students describe and define the attributes of a triangle. As part of this study the following

materials were collected: (1) pre and post assessments; (2) field notes from classroom observations; and (3) student work samples. Eighty-five 1st and 2nd grade students were interviewed prior to instruction using podcast technologies. These technologies captured the students' voices as they described attributes of given shapes. Analysis of the podcasts, field notes from the instructional tasks, and student work samples focused on the vocabulary students used when explaining their answers as well as on common misconceptions they have about triangles. For example, students often focused on the orientation of the triangle and/or the size of the angles rather than focusing on the definition of a triangle as being a closed shape with three straight sides and three angles. A follow-up post-test was conducted to determine if the lesson activities impacted the knowledge base of the students. The results indicate that the instructional activities were indeed effective in growing students' knowledge of essential characteristics of triangles, including using more robust academic vocabulary.

U.57 Determining Megakaryocyte Levels in Ground Squirrels throughout Hibernation

Molly Fahrenkrog
Advisor: Scott Cooper, Ph.D., Biology

The purpose of the research was to examine bone marrow changes in thirteen-lined ground squirrels, throughout their hibernation cycle. Specific cells within the bone marrow, called megakaryocytes, were detected with immunohistochemistry staining. The megakaryocytes were also measured for size and quantity during the hibernation and arousal periods in the squirrels. Megakaryocytes are important to the bone marrow, as they produce important proteins vital to the health of the bone marrow and the blood. By detecting the transition of immature to mature megakaryocytes throughout hibernation, insight into the process of depletion and reconstruction of bone marrow in the thirteen-lined ground squirrels can be gained. The bone marrow remodeling process done by the squirrels can potentially be applied to humans for clinical use. If the transition process is fully understood, a method can be developed to repair bone marrow in humans. Additionally, this potential method could be used to treat human disorders in which the megakaryocytes are scarce or absent. These methods could be done without undergoing invasive techniques such as bone marrow transplants, currently the only treatment for human bone marrow diseases.

U.58 Preschool Language Delays: A Case Study

Kerrie Fanning
Advisor: Ann Epstein, Ph.D., Educational Studies

The purpose of this research study is to study a three year old child's language development and language expression by observing interactions during play-based conversations with his caregivers and peers, and by interviewing his parent(s) and caregivers. This child is showing delays in his language development. My research objectives consist of (1) reviewing previous research studies done on language development and delays, (2) observing the child in play-based conversations, (3) documenting the child's expressive language, (4) interviewing the child's parent(s) and caregivers, and (5) analyzing data from above observations and interviews. The expected results of this research study is to gain insight into the progress of language development when language delays are present, and to learn more about the way a child may interact with their delay. The potential benefits provided by this research study for the child, family, and caregivers involved include various knowledge about general language delays and potential disorders, as well as information on diagnosing and identifying language delays in preschool age children.

U.59 Skull Bone Densities in the American Alligator (Alligator mississippiensis) and their Relationship to Feeding Function

Cody Fisher, Mari Sweetman
Advisor: Eric Snively, Ph.D., Biology

The highest recorded bite forces have been exhibited by crocodilians, which includes the American alligator (Alligator mississippiensis). These reptiles have the ability to crush turtle shells and comparable prey. Based on media showing alligators holding prey towards the center arch between the maxilla and dentary bones of the mouth, we hypothesized that the maxilla is denser to account for the additional force that the prey exerts on the alligator's jaw through extraneous movement and additional crushing forces needed to feed. METHODS: Through examination of a CT scan of an American alligator in OsiriX, a medical imaging program and creating a 3D volume model, we observed the range of densities of the skull bones. Muscle forces and constraints were applied to an alligator skull model in the engineering

program Strand7, to show stress build up in certain areas during feeding. At higher bone density and corresponding stiffness, strain (deformation) and possibilities of breaking are lower. RESULTS: Density distribution: Though the density of the skull is very dense all around, it is particularly high as compared to the rest of the skull on maxilla and dentary (including connected teeth), the jugals and the posterior skull roof. Stress distribution: Our findings show that the bite force applied to the maxilla is directly related to those areas of high bone density. IMPLICATIONS: As predicted, the model displayed a correlation between the maxilla's higher bone density and the high stress levels that are applied through crushing prey. Some possible improvements for the research could include testing a variety of alligators and other crocodilians of differing sizes and bite forces. This would ensure that the results are not skewed by this particular specimen. This work will enable us to study bite function in modern and extinct crocodilians and the evolution of feeding styles.

U.60 Using Bioacoustics to Monitor Amphibian Speciation in Urban Wetland Sites

Michael Fuerte
Advisor: Robin Tyser, Ph.D., Biology

In 2000, Congress allocated funds to the U.S. Department of Interior and its agencies to conduct research on the declining amphibian populations in the U.S. Frogs are especially sensitive to changes in their environment, and thus their decline has been partially attributed to climate change. In order to efficiently monitor how frog populations respond to environmental changes, including climate change, we investigated the use of acoustic recorders to monitor frogs in an urban environment. Our study had two main objectives: to determine seasonal activity patterns of urban frogs in La Crosse area marshes and if those patterns varied among marsh sites. To conduct this experiment, we utilized four acoustic wildlife recorders and placed them in four different urban wetland sites in the La Crosse Myrick Marsh. These recorders were programmed to activate and collect sound data for five minutes every hour from mid-April through mid-July. These audio files were recovered on a 30 to 45 day cycle and then transformed from audio signals into visual plots. Using these plots, or spectrograms, we were able to identify frog species that were present in each site by measuring call frequency (Hz) and audio intensity (dB). Our research shows that frog species and seasonal call patterns were somewhat variable among our study sites including sites that were in close proximity to each other. Whether this is due human or natural factors is unclear. For future monitoring, we would like to establish a wetland control site in a non-urban environment, correlate frog activity patterns with specific environmental factors, and analyze sound data from previous years to better understand amphibian decline or seasonal migration.

U.61 Increase Education - Increase Happiness: A Study on How Educating Disadvantaged Children Can Affect a Community's Happiness and Quality of Life

Julia Johnson
Advisor: Keely Rees, Ph.D., Community Health Education

Frequently the United States takes for granted the accessible educational and therapeutic services for children with disabilities. Even in low socioeconomic situations the U.S. government offers programs such as the Administration of Intellectual and Developmental Disabilities, which ensures that individuals with disabilities and their families have access to culturally competent services, support, and other assistance opportunities that promote productivity, and inclusion in the community. Unfortunately not all countries have accessible services for children with disabilities. As a result, 90% of these children worldwide do not attend school. Estimates say that India has twelve million children living with disabilities; with only 1% have access to school (Childline 1098, 2013). Increase Education - Increase Happiness: A Study on How Educating Disadvantaged Children Can Affect a Community's Happiness and Quality of Life discusses how fundamental education has an effect on disadvantaged individuals and a communities overall happiness and quality of life. The qualitative data came from children, teachers, mentors, and volunteers allowing the researchers to get an encompassing sense of how the education that they are directly involved in impacted themselves, the students, the community and the state they reside in. Through the key informant's responses and the student's behaviors, it can be concluded that schools provide an environment where the students practice better hygiene and express a sense happiness from their environment. Increasing access to quality education by opening more special schools can improve the quality of life of the individual in-turn affecting the community, state and country's overall wellness and happiness.

U.62 Oneota Faunal Analysis: Reconstructing Diet and Seasonality at Tremaine

Amanda Jones
Advisor: Constance Arzigian, Ph.D., and James Theler, Ph.D., Sociology and Archaeology

The Oneota was a late Prehistoric tradition that lived in the Upper Midwest of North America. They first settled in La Crosse, Wisconsin around A.D.1300 having similar material remains distinct from the previous Woodland tradition. By A.D.1625, the Oneota abounded their settlements in La Crosse. They differed from past traditions in large part to their expert ability to manipulate the landscape for maize agriculture and absence of effigy mounds. Archaeological excavations of their complex raised field systems and technologically-advanced plant storage pits has allowed us to know a great deal about the plant portions of Oneota diet, but we know less about the role that animals played in Oneota subsistence. My research is a detailed analysis of the animal remains from an Oneota site called Termaine, located 20 minutes north of La Crosse, Wisconsin. The faunal remains, collected during the 2012 University of Wisconsin-La Crosse archaeological field school, were found in six features at the site, containing: bison, fish, elk, deer, and a variety of other animals. This study of faunal remains from a single Oneota site can be combined with other studies in order to discuss Oneota subsistence patterns and site occupation; and help contextualize the shift in Oneota culture from the previous Late Woodland tradition.

U.63 Transcriptional Regulation of Staphylococcus aureus Genes Following Exposure to the Drug SK-03-92

Michelle Lane
Advisor: William Schwan, Ph.D., Microbiology

Staphylococcus aureus causes soft tissue infections. Drug resistance in S. aureus strains is a big problem and us getting worse. New drugs are needed. A drug being developed at UW-La Crosse, coded SK-03-92, maybe the answer. SK-03-92 has shown broad killing activity against gram positive bacteria. Unfortunately, we do not know the mechanism of action (MOA) for the drug. To help find the MOA an RNA microarray was performed that showed several genes that were other down-regulated or up regulated in SK-03-92 treated S. aureus versus untreated S. aureus. Some follow up work has verified that the srtA gene that encodes sortase A was up-regulated after treatment with the SK-03-92 drug. In this study we propose to do further follow up work on the srtA gene as well as confirm the regulation of some of the other genes that were up- and down-regulated in S. aureus treated with SK-03-92 using a quantitative reverse transcribed polymerase chain reactions (qRT-PCRs) procedure. We hope that these qRT-PCR will help us unweave the MOA of SK-03-92.

U.64 Masculinity and Rape: The Role of Entitlement

Kyle Marmesh
Advisor: Betsy Morgan, Ph.D., Psychology and Terry Lilley, Ph.D., Women's, Gender and Sexuality Studies

Men comprise the vast majority of rapists and because rape proclivity has been linked to actual sexual aggression and perpetration it is important to understand the etiology of rape tendencies in men. The current research explored the relationship between rape proclivity and adherence to traditional masculinity. Specifically I examined the role entitlement plays in this relationship. Past research has demonstrated that an adherence to traditional gender roles is predictive of a higher sense of entitlement which is in turn predictive of higher rape proclivities However past research has not explored whether not a sense of entitlement could exist independent of adherence to traditional masculinity. Scholars have suggested that even men who have egalitarian gender ideals may still experience personal gender privilege connected to male socialization. Therefore, it can be hypothesized that an individual may be able to hold egalitarian gender views while still retaining his own sense of entitlement and thus still exhibit a proclivity for rape. An online survey was sent to a random sample of 1000 undergraduate males. A final sample 119 usable surveys was achieved. The survey included an entitlement scale, a gender role journey measure (a measure combining gender traditionalism items with attitudes toward sexism), a sexual coercion scale and a rape proclivity measure. Analysis revealed the only significant relationship to be between sexual coercion and gender role traditionalism ($p = .025$). Although this relationship was predicted, the absence of any other significant relationships contradicted both my hypothesis and past researcher's findings. Of particular interest was the lack of relationship between entitlement and traditional masculinity ($p = .398$). A significant relationship between these two factors has been well established in the literature. My studies failure to replicate these finding suggests that there may be something unique about UWL males or that sampling error occurred.

U.65 Purification and Isolation of Synthetic Nucleosomes through Size-Exclusion Chromatography

Stacey McMorrow
Advisor: Dan Grilley, Ph.D., Biochemistry

The structure of any macromolecule strongly correlates with its function as well as its ability to carry out its function correctly. Our research group has focused on determining the structure of chromatin fibers, that is, the structure of arrays of the protein-DNA complexes called nucleosomes. To form synthetic nucleosome arrays requires the incubation of histone proteins with two different DNA sequences – a target DNA sequence and a competitor DNA sequence. The arrays of nucleosomes formed on the target DNA sequence must be purified from the competitor DNA before further experiments are undertaken. The purpose of the research presented here is to isolate and purify the desired nucleosomal arrays through the use of size-exclusion chromatography. Chromatography separated the reconstituted samples into fractions that were then assayed for DNA concentration using fluorescence. The analysis of the purification process was monitored through the use of gel electrophoresis. Based on banding patterns size-exclusion chromatography provides robust separation of the nucleosome arrays from contaminating DNA.

U.66 Functional Movement Screen: Incidence of Injury from Asymmetries or Score

Jerald Charles, Emily Franz, and John Michel
Advisor: Keri Emineth, MS, ATC, LAT, Athletic Training

The Functional Movement Screen (FMS) scoring system has been used as a tool to predict the risk of injury in athletes. To date, the majority of research has shown that a score of 14 or less on a 21 point scale correlates to a higher risk of injury; however, little data exists examining the role of asymmetries in injury risk. The purpose of this study is to compare injury rates for athletes with an FMS score of 14 or below with injury rates in athletes with asymmetries. The goal is to determine the more reliable predictor of future injury in athletes. This research is currently being conducted at the University of Wisconsin-La Crosse in Mitchell Hall and is expected to be complete in March of 2014. Student-athletes on the UW-La Crosse wrestling team are subjects for the project. The independent variables are symmetrical status as defined by FMS and FMS raw score. The dependent variable is if an injury occurs or does not occur. The wrestlers are being monitored for injuries that result in altered wrestling function or loss of practice or competition time throughout the 2013-2014 wrestling season. Once data collection is complete (March 2014), a SPSS statistical analysis will be run to determine if symmetrical status or FMS score is a better predictor of injury. We hypothesize that symmetrical status will be a better predictor than FMS score. We hope the results can aid clinicians in predicting risk of injury and therefore appropriately direct prevention strategies. We expect our study to lead to further research into the ability of FMS to predict which athletes have the greatest risk for injury.

U.67 Assessing the Influence of Aquatic Plants on the Spatial Distribution of an Invasive Snail and its Parasites in the Upper Mississippi River

Kaitlyn Miedema
Advisor: Greg Sandland, Ph.D., Biology

Invasive species threaten local biodiversity in ecosystems worldwide; however, the role that invasive species play in disease emergence and persistence in native habitats remains poorly understood. Bithynia tentaculata is an invasive aquatic snail that was first discovered in the Upper Mississippi River (UMR) in 2002. Since that time, this snail has indirectly caused thousands of waterfowl deaths due to its ability to transmit trematode parasites to migrating birds. Although B. tentaculata has already altered the native ecosystem dramatically, little is known about the factors underlying snail and parasite distribution in this region. In this study, we used field data to investigate whether aquatic macrophytes influence the distribution patterns of B. tentaculata and its parasites. Macrophytes were collected from two different sites within Pool 8 of the UMR and subsequently assessed for B. tentaculata densities. Snails were then necropsied to determine levels of parasitic infection. Results from this work indicate that B. tentaculata tends to occur at higher densities on particular macrophyte species; however, snail infection levels tend to be consistent across plant species. In addition, snail densities differed significantly between sites, suggesting that additional factors, such as water flow and substrate proximity, may facilitate snail colonization. Results from this research suggest that macrophytes may be important for the distribution of this invasive species (and therefore their parasites) in the UMR. Better understanding these associations may help in the development of control strategies aimed at reducing waterfowl mortality in the region.

U.68 Comparing the Effects of Prescribed Burning on Nest Survival Rates for Grassland and Forest Birds

Molly Neumann
Advisor: Douglas Baumann, Ph.D., Statistics

The proposed research aims to determine the effects of prescribed burning on nest survival rates of grassland and forest birds. The Upper Midwest Environmental Sciences Center (UMESC), a sub-division of the US Geological Survey (USGS) and located on French Island, collected data from southern Indiana on a variety of species and factors, including time since last burn and landscape characteristics. These data will be analyzed using a logistic exposure model and Bayesian model averaging in order to examine nest survival over time with varying bird ages. The results of this study will be used by the USGS to develop regulations for prescribed burning. These regulations will serve to minimize population decline of grassland bird species due to habitat fragmentation, which is an increasingly common and devastating phenomenon in the Midwestern United States. The final results will be presented at large conferences, such as National Conference on Undergraduate Research (2014) and the Kansas State Conference on Applied Statistics in Agriculture, and scholarly Ecology journals, such as BioOne.

U.69 Sandstone Rock Shelter Distribution of the Kickapoo Valley Reserve

Nathan Noble
Advisor: Colin Belby, Ph.D., Geography

The Driftless Area is a unique unglaciated landscape of southwest Wisconsin that includes the Kickapoo Valley Reserve (KVR). This 3,468 hectare (8569 acre) park located in eastern Vernon County, Wisconsin contains dozens of rock shelters tucked into the steep valleys that connect to the Kickapoo River. Although little scientific research has been done on the distribution of these formations, KVR staff indicated that the shelters tend to form in the sandstone bedrock around the 275 m (900 ft) elevation contour. The objectives of this study are to 1) determine if the rock shelters are in fact forming at an elevation of 275 m, and 2) to determine how their dimensions vary across the reserve. To test these objectives, valleys within the reserve were walked and elevation, latitude, and longitude were recorded at each shelter found using a differential GPS. In addition, width, depth, and height of each shelter were measured using a laser rangefinder. While the height of shelters varied from less than 1 meter (3 ft) to over 6 meters (20 ft), only shelters exceeding a height of 2 meters (6 ft) were used in this project for means of accurately recording the height of the shelters. A total of 23 shelters meeting this criteria were measured, recorded, and mapped using ArcGIS. Elevations of the shelters range from 256 m (840 ft) to 271 meters (890 ft), generally sloping to the southwest. No correlation was found between shelter size and location in the reserve. This information will be provided to the staff at the KVR for their records, and it could aid in future geological and archaeological research in finding similar shelters throughout the Driftless Area.

U.70 Battle Royale: Competition for Space between the Seastars, Ophiocoma echinata and Ophionereis reticulata, around South Water Caye, Belize

Carly Olson, Sierra Leinfelder, and Brittany Maule
Advisor: Gretchen Gerrish, Ph.D., and Greg Sandland, Ph.D., Biology

Rocky-intertidal zones are ecosystems that have a wide range of biodiversity. Space is often a limited resource in the intertidal and competition can be fierce, even at the level of microhabitats found beneath rocky substrates. In the reef intertidal habitat surrounding South Water Caye two species of brittle stars, Ophiocoma echinata and Ophionereis reticulata, are common. We conducted transects to quantify the density of these species in their native habitat as part of an observational study in order to gain insight on natural abundance. We found that O. echinata were more naturally abundant but that the two brittle stars commonly overlapped. Representatives of each species were then collected for subsequent laboratory manipulations in which competition for space, within and between species, was analyzed using arenas with a light and dark side. Both species exhibited a preference for darkness opposed to light. Minimal displacement was found with the first star after the introduction of the second, suggesting coexistence within and between species. Coexistence between brittle star species with minimal competition may support that these organisms have extensive resources or that some other type of ecological interaction (mutualism, commensalism) is taking place.

U.71 Autism Stressors and Reliefs: A Qualitative Study of Parents' Perspectives

Alissa Otto, Betty DeBoer
Advisor: Betty DeBoer, Ph.D., Psychology

Parents of children with Autism Spectrum Disorder (ASD) have been identified as having elevated stress, which can negatively impact a child's functioning. Schools can serve as a source of support, making collaboration critical. Results examine the daily stressors associated with parenting a child with ASD and how schools can play a role in providing support to parents. Information will assist educators by allowing them to better understand this population's needs to collaborate more effectively.

U.72 Global Climate Change: The Consequences of Salinity Change on Tropical Corals, Siderastrea Radians, in South Water Caye, Belize

Ellen Arndt, Zachary Mestelle, and Nicholas Rappa
Advisor: Gretchen Gerrish, Ph.D., and Greg Sandland, Ph.D., Biology

Current global climate change events are having an important impact on coral habitats worldwide. One of the key culprits believed to be influencing coral health is changing salinity, yet the impacts of this factor on corals off the Belizean coastline remain poorly understood. To help fill in this informational void, we collected Siderastrea radians and exposed polyp colonies to five different salinity treatments: 50:50 (fresh water to salt water), 40:60, 25:75, 20:80 0:100. We then monitored two main attributes of the polyps (mouth positioning and tentacle positioning) at a number of set time points over a predetermined period. Two experiments were conducted consecutively over two days. Results suggested an overall trend where salinity reductions correlated with decreases in coral health. Siderastrea radians are known to be one of the hardier tropical coral species, suggesting that our work may actually under-estimate the impact that changing salinities may be having on overall coral communities. Together, our results provide insights into the detrimental (and potentially wide-ranging) effects that reduced salinity may have on reef-ecosystem health in Belize.

U.73 Food Preferences in Tropical Bioluminescent Ostracods: What's on the Menu?

Josh Shirley, Natalie Renier
Advisor: Gretchen Gerrish, Ph.D., Biology

Following the night of the full moon, off the shore of South Water Caye, Belize, bioluminescent marine crustaceans known as ostracods emerge to preform stunning reproductive displays. Even within a small patch of reef there is significant variation among species with 5-6 species displaying over a single coral head. Little is known about these rare species apart from differences in morphology and spatial distributions during displays. It is likely that these species occupy separate ecological niches; however, scientists do not even know where these organisms reside during the daytime or what they eat. Here we explored what three different bioluminescent ostracod species utilize for sources of nutrition. Male specimens of three species, Kornickaria hastings, Photeros morini, and Massed Shallow Horizontals (MSH), were collected during their bioluminescent displays. Food preferences were estimated based on preliminary examination of gut contents. Observation of organisms resembling zooxanthellae along with spicule-like structures indicated ostracods may be feeding on corals, mucus or sponges. These food choices were presented to each species of ostracod and consumption was quantified via gut measurements pre- and post-feeding to determine if uptake occurred. Data showed discrepancies towards hypothesized food preferences; however, results implied the potential for an alternative role of mucus in ostracod behavior.

U.74 Does an Association Exist between the Density of Common Sea Fans (Gorgonia ventalina) and Aspergillus sydowii Infections in the Caribbean?

Mercedes Siegle-Gaither
Advisor: Greg Sandland, Ph.D., Biology

Over the last two centuries, a substantial amount of coral disease has emerged, posing an enormous threat to reef systems around the world. Of the 29 coral diseases known worldwide, 75% originated in the Caribbean. One such

disease agent is Aspergillus sydowii, a fungus that causes a disease known as Aspergillosis in a number of Caribbean Sea fan species (Gorgonia ventalina and Gorgonia flabellum). Aspergillus sydowii can be introduced into marine systems via airborne dust or terrestrial runoff. Once established the fungus can then spread from diseased corals to healthy corals either through direct contact or via transmission of fungal propagules through the water column. To test the idea that coral density is associated with the incidence of Aspergillosis, I counted the number of diseased and healthy sea fans within a number of reef plots off of South Water Caye in Belize. Results suggest that there is a positive trend between sea fan densities and fungus infection. The ecological ramifications of this result will be discussed.

U.75 Can Dissolved Organic Carbon Reduce the Toxicity of Triclosan?

Kelsey Skoyen
Advisor: Nadia Carmosini, Ph.D., Chemistry

Numerous studies have evaluated the toxicity of the common anti-microbial agent triclosan (TCS) on aquatic organisms using standard laboratory assays. However, in natural aquatic environments, dissolved organic matter (DOM) may bind TCS, thus reducing its bioavailability to aquatic organisms. This study assessed the toxicity of TCS on a sensitive algal species, Scenedesmus subspicatus, in the presence and absence of Leonardite humic acid (Leo-HA). S. subspicatus was cultured in Jaworski media and allowed to achieve logistic growth before being inoculated into following treatments: control, 1.25 ppb TCS, 2.50 ppb TCS, 1.25 ppb TCS plus 20.0 mg/L Leo-HA, and 2.50 ppb TCS plus 20.0 mg/L Leo-HA. Four replicate were prepared for each treatment, which were then grown under continuous light. Algal cells were enumerated using a hemacytometer every 24 hours for three to seven days. At the end of the experimental periods, 2.50 ppb TCS was found to be acutely toxic to S. subspicatus, while 1.25 ppb TCS reduced algal growth by 50%. In contrast, in the presence of Leo-HA, no significant difference was observed for S. subspicatus growth in the control, 1.25 ppb TCS, and 2.50 ppb TCS treatments. These results indicated that the presence of dissolved organic carbon compounds may reduce the toxicity of TCS for certain sensitive organisms.

U.76 The Effect of Fatigued Photoreceptors on Color Perception

Lowell Thompson
Advisor: Alex O'Brien, Ph.D., Psychology

A multitude of prior research has been conducted in attempt to reveal the impact that language may have on color perception. However, past research has been quite divisive. Some studies have revealed language's possible impact on a group's ability to discriminate between colors (Roberson et al., 2005), while others have shown color naming and color perception may be independent of one another (Jameson et al., 2005). O'Brien (2005) proposed to develop a color perception test capable of identifying perceptual differences, when existent, between groups. Results of the test have confirmed a capacity to reveal color perception differences between red-green color deficient and normal observers. The current study further investigates the capacity of this test to reveal color perception differences by altering the perception of normal color observers. Fatiguing, or bleaching color photoreceptors via a prolonged visual stimulus will briefly create a color after-image in a specific area of a participant's visual field. This image will then overlay, and thus alter, the hue of a presented color stimuli within the test. Although the specific pattern of color matches resulting from photoreceptor fatigue is difficult to predict, the goal of the current research is to further demonstrate that this methodology is capable of identifying differing subjective experiences of colors between individuals or groups of individuals.

U.77 Isolated Oneota Human Remains

Isaac Vroman
Advisor: Constance Arzigian, Ph.D., Sociology & Archaeology

The Oneota were a semi-sedentary agricultural group in the upper Midwest, whose sites have provided a wealth of mortuary and burial practice information for the first half of the second millennium. What is less understood is isolated human remains in non-mortuary contexts found at these sites. By analyzing human remains from several Oneota sites, evidence such as cut and bite marks point to foul play. This research not only increases our understanding on Oneota warfare, their potential use of human body parts as trophies and cannibalism, but how different groups of people treat the remains of each other's dead.

U.78 Using Gold Nanoparticle Amplified Targets to Develop Surface Plasmon Resonance (SPR) Spectrometry as a Method of Measuring the Thermal Stability of DNA Hybrids on a Surface

Caleb Wagner
Advisor: Aric Opdahl, Ph.D., Chemistry

The goal of this project is to adapt surface plasmon resonance imaging (SPR) spectroscopy as a tool for characterizing the thermal stability of short DNA hybrids attached to metal surfaces. We have designed and built a wavelength-scanning SPR that is capable of providing the required measurements as a function of temperature. In preliminary experiments, we observe that the analytical signal associated with thermal denaturation of DNA hybrids is near the detection limits of the instrument. To overcome this, we have performed a set of amplified hybridization experiments using gold nanoparticle labeled targets to amplify the instrument signal. The nanoparticle experiments are aimed to validate that the instrument and experimental methods in use do indeed work. Ultimately, these methods will lead to new tools for understanding how DNA behaves on a surface, potentially leading to DNA sensors that are more selective and sensitive.

U.79 Screening Potential Anthelmintic Compounds for Novel Activity

Kendra Wells
Advisor: Jennifer Miskowski, Ph.D., Biology

Infections by helminthes, or parasitic worms, are a worldwide problem in both animals and humans. The problem is further compounded by the fact that many helminth strains have developed resistance to the drugs, called anthelmintics, available to treat these infections. To combat this problem, drugs that act in a mechanism different from that of existing drugs need to be identified. A multi-departmental effort to find natural compounds with different pharmacological activities is in progress at UW-L. Multiple compounds have been identified that show anthelmintic activity against Caenorhabditis elegans, a non-parasitic worm that is very similar to helminths and often used in anthelmintic research. The purpose of this project is to determine if any of our prioritized compounds act through a different mechanism than existing drugs on the market. To test our compounds, two different assays will be performed using wild-type C. elegans as a control and mutant C. elegans strains that are each resistant to one of the existing anthelmintics on the market. Preliminary data shows that one compound, CL-5, is effective against seven different mutant strains of C. elegans. These mutants include those that are resistant to three specific anthelmintics: ivermectin, benomyl, and levamisole. The work performed this summer focused on levamisole. Four levamisole-resistant mutants were shown to be sensitive to CL-5, further supporting the idea that CL-5 acts via a novel mechanism of action.

U.80 Two Dimensional Design with Three Dimensional Media

Elizabeth West
Advisor: Bradley Nichols, B.S., M.F.A, Art

The topic of my research is to explore alternative methods of two dimensional painting using three dimensional medium. Specifically, I will be using everyday objects, such as rubber bands to create a familiar yet reinvented tactile experience for the viewer. My intention is to experiment with the physical and visual qualities of found materials to create an environment which engages the senses of the audience. I will be taking inspiration from abstract expressionists in order to expand on the preconceived boundaries of painting. By “painting” with three-dimensional objects on a traditional two dimensional format, I will change the viewer’s interpretation of not only the objects, but painting itself. The method I will use to complete the project will be the tedious task of fabricating thousands of rubber bands to gridded support. However, the visual complexity of the project will lay in the composition of the work which is vital to create a new, captivating experience with texture. The expected outcome is a series of three pieces that successfully explore a new method of mark making which provides a new reality for the audience.

U.81 Acceptance and Commitment Therapy

Ann Zedginidze

Advisor: Ryan McKelley, Ph.D., Psychology

The purpose of this study was to further examine the validity and extend the support for Acceptance and Commitment Therapy (ACT). The negative effects of being ostracized were used as an approach to study the effectiveness of ACT. All the participants engaged in an online ball toss game that made them feel excluded from the group. The independent variable being manipulated consisted of whether the participants would listen to an ACT based audio, a relaxation audio or no audio at all. The change in mood and self-esteem will be measured and it is predicted that the participants in the treatment group who will listen to an ACT based audio will experience the least amount of impact on their mood compared to the control and active control group.

U.82 Purification of Antibodies against the HPIV3 Matrix Protein

Melissa Zins
Advisor: Mike Hoffman, Ph.D., Microbiology

Human Parainfluenza virus type 3 (HPIV3) is an enveloped, non-segmented, negative-strand RNA virus belonging to the family Paramyxoviridae, which also includes the measles, mumps and respiratory syncytial virus (RSV). HPIV3 is the second most common cause of lower respiratory tract infections, such as bronchitis, croup and pneumonia in children, infants and immune-compromised individuals. There are several proteins that are integral to the virus life cycle. The protein of focus, matrix (M), is key in the budding and release stages of the virus, however the role and interactions with the other virus proteins in an infected cell is not well understood. To further clarify M protein's interactions in budding and release stages, antibody specific for matrix protein was purified, and then concentrated to be used in a series of experiments, such as immunofluorescence and cellular localization, to illuminate matrix protein's interactions in virus-infected cells. The long term potential for studying matrix and its interactions with the other virus proteins could lead to knowledge that may be useful in making antiviral medicines or possibly a vaccine.

U.83 What do the Bones Say? Skeletal Analysis of the Nineteenth Century Burials at Voegtly Cemetery, Pittsburgh

Amanda Fink
Advisor: David Anderson, Ph.D., and Tim McAndrews, Ph.D., Archaeology

A cemetery is known to be a body's final resting place in the journey of life, but what happened at Voegtly Cemetery in Pittsburgh in 1987 proved a longer journey for the 823 forgotten burials. Abandoned in 1861, the Voegtly Church Cemetery was later paved over after the gravestones were moved approximately 1.5 miles to Troy Hill. Rediscovered due to interstate construction each grave was systematically excavated paying close attention to the bones in each grave. This study examines the data sets of burial remains and church burial records to attempt to find relationships between post-burial bone weathering and factors such as age, sex, and disease. Through these correlations one can obtain a more detailed history of the past Swiss-German immigrants of Allegheny County, and application of these correlations can provide valuable data on the relationship between the specific individual and posthumous weathering of skeletal materials from archaeological and forensic contexts.

UNDERGRADUATE ORAL PRESENTATION ABSTRACTS

UR.1 University of Wisconsin-LaCrosse Diversity and Literacy Learning Outcomes: Assessing how UW-L Diversity and Inclusion Initiatives Enter the Residence Halls

Philippe Meister
Advisor: Darcie Thoune, Ph.D., English

This project has been influenced by the theoretical perspectives of Michael Foucault, Judith Butler, Eduardo Bonilla-Silva, Beverly Daniel Tatum, and others writing in Cultural Studies and Critical Race Theory. My project focuses on Bonilla-Silva's Racism without Racists in which he outlines frames of speech used to minimize cultural racism. My project builds off Bonilla-Silva in that it aims to further investigate the mechanisms that form values about cultural diversity. My project questions how students use campus texts to understand the campus structure and become enculturated into a space where multicultural discourse is an institutional goal. More specifically, I'm examining diversity statements across UW-L's campus. The data collection consists of two parts: the first is a survey of students on the importance of the diversity discourse on campus; the second is a conversation with students about The Department of Residence Life Diversity Statement. UW-L diversity texts are important to study because UW-L has invested time and resources into developing LGBT and multicultural resources on campus in concert with moving forward with initiatives designed to support diversity and inclusivity on campus. Multicultural or LGBT campus resource spaces, like the Pride Center or Office of Multicultural Student Services, support the diverse student body and influence the campus culture. This project analyzes quantitative and qualitative data on how publicized diversity texts become an essential component of student learning at UW-L.

UR.2 Reasoning with Paradox, Contradiction, and the Second Earl of Rochester

Alexandria Hughes
Advisor: Kate Parker, Ph.D., Communications

My undergraduate research project will explore John Wilmot, Second Earl of Rochester's poem "A Satire Against Reason and Mankind" to discover the extent, and possible intent, of the contradictions and paradox infused in the rebellious, controversial poem and discuss how this might be relevant to researchers today. I will investigate how well it competes as an organized, complete philosophy in order to prove, or disprove, the opposite. Through the analysis of more basic literary and rhetorical concepts I will identify several ways the poem is inherently contradictory: through the juxtaposition of form and content, by acknowledging inconsistences in logical reasoning, and by comparing "A Satire Against Reason and Mankind" to another of Rochester's works, "A Satire on Charles II". I will challenge my own thesis, that Rochester's poem is nothing more than a satire written by a man who couldn't make up his mind, with the argument of another critic who insists that consistent contradictions act as a unifying force and an idealized, purposeful strategy on the earl's behalf. Recounting my journey through "A Satire against Reason and Mankind" will give clarity and order to an otherwise confusing, circular argument. Countering popular interpretations of the poem, including my own, by considering justifications for all contradictions (i.e. human nature), and studying other philosophies and potential influences on one of Rochester's most renown works, will allow for critical thinking and deeper analysis to further improve my research. By attempting to reason with paradox and make sense of contradictions, I will be left with only one conclusion—while Rochester may balk at reason, theorizing, greater learning, and all the institution of undergraduate research represents, I will embrace a singular truth: even inconclusive or unsettling findings may leave a researcher more knowledgeable and bettered by the experience.

UR.3 Deconstructing Neutral Milk Hotel

Nathaniel Smith
Advisor: Kelly Sultzbach, Ph.D., English

Much fan speculation about the 1998 Neutral Milk Hotel album In The Aeroplane Over the Sea has led to the popular theory that the album is about Anne Frank. Song titles, lyrics, and Jeff Mangum, the band's songwriter, alluding to inspiration from his dreams of a European family from the 1940s support this theory. However, a deconstructive

analysis of the album itself reveals that what seems like Mangum's manifested dream-content about Anne Frank becomes 'traces' of meaning pursuant to Jacques Derrida, and listeners find themselves at the center of play between lyrical and musical forces, which give rise to various interpretations. With self-referential adjustments to the lyrics confessing Mangum's struggles to communicate his songs' meanings accurately, and Aeroplane's legacy marked by lyrical mysteriousness, an easy "Anne Frank interpretation" becomes troublesome and has less chance for stability as a meaning. Despite evidence that the songs are possibly about Anne Frank, Mangum gives reason against trusting his role as guarantor of his songs' meanings, and attacks his own authority as author. The album's lyrical content and instrumentation avoid an easy interpretive experience. If the album concerns Anne Frank, it's reflecting on her after she has died, with a sense of longing. But the lyrics are fluid and without a clear message or narrative. Likewise, the instrumentation is often wild, rowdy, and unconventional, with lively, inventive, bold horn movements. These considerations curiously complicate a story supposedly about saving a dead girl and her family. The peculiar and deliberate oppositions the album establishes, by which it destabilizes itself and evades a single interpretation, are overlooked by the popular interpretation accepted by many, thus the album invites multiple interpretations. A fixed meaning is elusive with regard to the present contradictions, and any meaning-possibility arises from a Derridean play of the album's polar forces.

UR.4 Nothing Brings People Together Like Grumpy Cat: Internet Memes and Group Convergence

Elaine Johnson
Advisor: Michael Tollefson, Ph.D., Communications

The word "meme" has existed since the 1970s, but it is only in recent years that it has become a common term with the rise of the internet meme. This study examined how the internet meme, a pre-existing image with words superimposed over it that give it new meaning, functions as a group fantasy in the context of Facebook groups. Previous research on internet memes is almost entirely lacking with the exception of Shifman (2012) who studied memetic YouTube videos, and Hahner (2013) who studied the internet meme known as "the riot kiss." Bormann's theory of Symbolic Convergence was used to understand group interactions centered on memes. The comment threads from twelve different internet memes were analyzed. Results indicated that comments can be grouped according to purpose: acceptance of the fantasy presented in the meme, rejection of the fantasy, and reaction to rejection of the fantasy. Depending on which of these purposes they had, group members used several different strategies in their comments. The success of the comments depended largely on whether they encouraged further discussion of the fantasy.

UR.5 Be Careful What You Say! How Language Affects Retail Associates

Crystal Kelleher
Advisor: Stephan Mann, Ph.D., English

Why do some customers keep coming back to the same store time after time? What makes other customers avoid the same store and never enter it again? Does language have anything to do with these attitudes? Going into my research, these were the questions that were at the forefront of my mind. I based my research questions on my over two years of experience working retail and helping customers. In order to answer these questions, I observed my fellow associates as they interacted with customers and one another while I was off the clock and not wearing my uniform. During associate-customer interactions, I took note of the number of times each associate had to repeat or clarify themselves, their use of "like," whether or not creaky voice was employed, if they were mumbling or not, their use of filler words like "ah" and "um," and how all of these affected how customers interacted with them. When taking notes on associate-associate interactions, all of the associates knew what I was doing and would even insist that I write down certain phrases of theirs verbatim, even if those phrases did not pertain to my research. Surprisingly, many more data points about associates' attitudes towards customers' linguistic patterns emerged during these observations. One associate in particular made many quick decisions about whether or not to keep talking to a customer based primarily on the customer's language choices, body language, and clothing. These observations and the conclusions drawn from them will allow academics and non-retail workers a glimpse into the inner workings of a culture they may not understand entirely but pass through on a fairly frequent basis. The associates' culture, interactions, and linguistic decisions are unique to them and will aid in bridging the gap between dissatisfied customers and life-long customers.

UR.6 As if a Man were Author of Himself: An Analysis of the Relationship between Coriolanus and Aufidius

Peter Dziadowicz
Advisor: Lalita Hogan, Ph.D., English

This essay analyzes the relationship between Coriolanus and Aufidius in Shakespeare's Coriolanus. It shows the mirrored character traits between the two, along with studying the defining characteristics that distinguish them from each other. In particular, their relationship is revealed to be one of dependency, where Aufidius can exist only in relation to Coriolanus for three reasons: Aufidius never appears independent of Coriolanus; he wishes to be Coriolanus; his self-destructive obsession with Coriolanus drives his action in the play. Further, this essay also briefly explores how Coriolanus needs Aufidius in a different sense. Namely, it is suggested that Aufidius's own particular traits could have acted as a cure to the constant nature of pride of Coriolanus's false self-image, and possibly prevented his death at the end of the play, but at the cost of his dignity.

UR.7 Devils in the Wilderness: How "Wilderness" Reflects Society's Margins

Cole Nelson
Advisor: Kelly Sultzbach, Ph.D., English

Throughout the evolution of the American horror genre, many stories have used the wilderness as a scene of strange and supernatural events. Haunted forests, ancient ruins, and barren deserts have been used just as frequently as any haunted house or castle. However, the concept of "wilderness" as a location and an idea has changed over time to fit different rhetorical purposes. Why are the wild lands of nature so often used in American tales of terror and the supernatural? I will be arguing that while "wilderness" is used throughout American horror to explore marginal practices and ideologies. I will be utilizing the theory of New Cultural Historicism to analyze how the use of "wilderness" in horror fiction is employed to both confirm existing beliefs and to play with the flexibility of culture. I will do this by analyzing three texts that are representative of different uses of "wilderness" through American literary periods. These texts will include the short story "The Devil and Tom Walker" by Washington Irving, the short story "The Dunwich Horror" by H. P. Lovecraft, and episode 22 of the contemporary podcast Welcome to Night Vale, titled "The Whispering Forest". For my use of New Historical Criticism I will be drawing on both Stephen Greenblatt's theory of "Culture" and William Cronon's analysis of nature throughout American history in his book Uncommon Ground: Rethinking the Human Place in Nature. This study will attempt to broaden our understanding of the uses of ecological descriptions, specifically within the horror genre, and to examine how studying these descriptions can lead us to a deeper understanding of cultural attitudes towards practices on the fringe of society.

UR.8 Using New Historicism to Critique Cultural Oppression and Discrimination in the Harry Potter Novel Series

Sarah Lechner
Advisor: Kelly Sultzbach, Ph.D., English

To most readers the Harry Potter books are a fantastical series about a young wizard boy and his fight to defeat the evil Lord Voldemort, but when New Historicism is applied, the story takes on a deeper meaning. To understand a culture one must look at the literature of the time; this is the foundation of New Historicism. Applying New Historicism to the magical creatures in Harry Potter helps the reader discern the cultural attitudes reflected in the series of novels. In some ways the Harry Potter series affirms and entrenches attitudes of discrimination and oppression through the treatment of werewolves and house elves. The Harry Potter series were written at a time when the AIDS epidemic was a prominent issue in our society. By using Stephen Greenblatt's ideas of constraint and mobility we are able to see how our culturally constructed attitudes towards AIDS are reflected in the series. Applying constraint to the way the magical community treats wizards infected with lycanthropy, it becomes evident that we fear and therefore discriminate against people with AIDS. However, mobility is demonstrated by the respect shown to the werewolf, Remus Lupin, by the students and friends who know him well. The house elves represent cultural minorities, who are both constrained and mobilized. We can see mobilization through the character of Dobby, yet house elves are constrained in the series. The house elves help defeat the Death Eaters in the final battle, but they will still be oppressed by wizards, thus proving how hard it is for minorities to have equal benefits in our society. The larger implications show how our culture still harbors fear of the AIDS epidemic. The treatment of house elves in the series mirrors our culture's discriminatory attitude toward non-white minorities.

UR.9 St. Paul's Letter to the Romans: A Critical Approach

Nicholas Covaleski
Advisor: Kelly Sultzbach, Ph.D., English

The Bible is the most well-known and influential text in the Western world. Its stories and parables serve as insight, inspiration, and much more for millions of people, Christian or not. The New Testament, of course, is a compilation of multiple authors, and the most profound of those authors is the Apostle Paul: his epistles account for thirteen of the twenty-seven books in the New Testament, and his teachings act as the foundation for much of contemporary Christianity. Paul's Letter to the Romans is his longest and arguably most important theological epistle. The letter is abundantly laced with messages of salvation, the divinity of Christ, morality, and love. While Paul's epistles have had an enormous impact on the history of Christianity, few have explored the personal and social context in which Paul composed his letters—that is the focus of this project. Information on Paul's biography and the context of the world that he was writing in will be filtered through the lens of New Historicist and Biographical Historicist literary schools of thought, revealing fresh and penetrating insight into the meaning of Paul's Letter to the Romans. I will explore why Paul is so concerned about affirming his status as an apostle, why his teachings emphasize personal faith rather than the doctrinal teachings of traditional Judaism, and why, ultimately, his letters have so profoundly shaped contemporary Christianity. Paul pushes the boundaries of first-century Jewish culture—he injects radical ideas that sharply conflict with the ideas maintained by Jewish leaders in Jerusalem, and preaches these ideas to gentiles in the Hellenized Jewish Diaspora. Ultimately, Paul shifts the boundaries so far that a new religion is born—one that will become the most powerful, popular, and influential force that the Western world has ever seen.

UR.10 Quantifying the Binding of Trichlorocarbanilide to Dissolved Organic Carbon

Aaron Sjobeck
Advisor: Nadia Carmosini, Ph.D., Chemistry

Trichlorocarbanilide (TCC) is an antimicrobial agent used in personal care products such as soaps, deodorants, and cosmetics. The use of these products leads to the introduction of TCC into the environment via waste water treatment plant effluents and biosolids. In the environment, the role of TCC as a contaminant depends on its mobility and bioavailability in the dissolved aqueous phase. However, as a poorly soluble hydrophobic compound, TCC is expected to sorb to dissolved organic carbon (DOC), which can enhance mobility, alter decomposition rates, and reduce bioavailability. We are quantifying the binding of TCC to natural DOC sources with variable chemical properties using an enhanced solubility technique. To date, experiments with Leonardite humic acid indicate that TCC is strongly sorbed with a measured log KDOC of 4.93 and aqueous solubility of 82 µg/L. Additional experiments are being conducted with Elliott soil humic acid and Suwannee River fulvic acid.

UR.11 An Intestinal Bacterium in an Aquatic Slug

Sydney Lomnes
Advisor: Bonita Bratina, Ph.D., Microbiology

Buttiauxella, an enteric bacterium, was isolated from the intestinal tract of Arion fasciatus, an invasive European slug species found in Midwestern spring fed creeks. This Buttiauxella isolate is closely related to the Buttiauxella species found in over 200 snail and slug strains in Europe. This could mean that either Buttiauxella is a cosmopolitan organism or was brought over from Europe with the slug. To view the physical relationship between the slug and the bacterium, two oligonucleotide probes were specifically designed complementary to regions of the 16S rRNA gene of Buttiauxella and fluorescently labeled. These probes were hybridized to fixed samples to observe the bacterium's association with the slug's intestinal wall and other bacteria within the intestinal tract. DAPI (4', 6-diamidino-2-phenylindole) was used as a counterstain to dye the DNA of surrounding cells, and a labeled Bacteria probe was used to as a positive control. Although the Cy3-labeled probe worked well, the fluoroscein labeled probe did not fluoresce very brightly due to some unknown cause. We attempted to optimize the fluorescent in situ hybridization procedures, using pure cultures of Buttiauxella, by manipulating various variables. These changes have only brought about a slight increase in fluorescence, so the fluorescein was replaced with Alexa Fluor 488. The optimized protocol has been used to hybridize cryosections of slug intestines to observe the bacteria within the slug intestinal tract. Once the hybridization procedures are optimized on the cryosections, we will be observing the sections with a confocal microscope to get a 3D image of in the intestinal tract with Buttiauxella and surrounding bacteria. This will allow us to determine if Buttiauxella is found

throughout the slug intestinal tract or in more localized areas, and whether it is found in close associations with other bacteria in the intestine.

UR.13 Dynamic versatility: How understanding hydroxamic acid behavior can lead to novel therapeutic treatments in a variety of pharmacological settings.

Stefanie Sippl
Advisor: Heather Schneck, Ph.D., Chemistry

For over thirty years hydroxamic acids (HA's) have been employed clinically as iron-binding agents. In particular, the HA containing drug Desferioxamine B has been used to treat the blood disorder thalassemia. However, the role of HA's has revolutionized beyond their metal-complexing capabilities. The therapeutic potential has extended into the realm of anti-microbial, anti-inflammatory, anti-hypertensive, and anti-cancer agents. Investigation is currently being performed in HA's ability to act as anti-bacterial conjugates. In addition, HA's have been found to inhibit enzymes such as cyclooxygenases, which are important for pain regulation and blood clotting. Thus, understanding HA functionality is key in design of a wide spectrum of bioactive compounds that could impact a variety of illnesses in society. In this project, I studied the behavior of the model hydroxamic acid N-methyl acetohydroxamic acid (NMHA) in various solvent environments. NMHA exists in two shapes known as "E" and "Z". HA's must be in "Z" to bind metal and "E" to inhibit some enzymes. The shape NMHA is found in is dependent on its environment. The Nuclear Overhauser Effect (NOE) technique of Nuclear Magnetic Resonance Spectroscopy (NMR) was used to study the structural preference of NMHA. Furthermore, NOE was also used in combination with the EXSY method and Arrhenius analysis to study the energetic barrier to rotation between the two shapes. We find that NMHA prefers the "E" shape in all solvent settings examined and a significant amount of energy must be contributed to rotate to its alternative "Z" shape. These findings can guide the design of novel HA-based drug compounds to treat a wide range of diseases.

UR.14 Exploring the Collective Properties of 160Gd using the (n, n'γ) reaction

Zachary Tully
Advisor: Shelly Lesher, Ph.D., Physics

We are currently investigating the collective properties of 160Gd through the (n, n' γ) reaction. Excitation functions and angular distributions measurements have been completed this past year. To finish our experiment we will be analyzing the data that we have gathered as a result of these experiments. As part of the experiment we hope to organize the spectra of 160Gd into levels, which will allow us to gain a better understanding of the heavy nucleus by future analysis.

UR.15 Effect of Femur-Tibial Translation on Estimated ACL Tension

Elizabeth Camenga, Alex Ehlert, Drake Kessler, Jillian Asmus
Advisor: Robert Ragan, Ph.D., Physics

Anterior cruciate ligament (ACL) injuries are very common for athletes in many different sports. Previous work in our lab has shown that ACL force is sensitive to the patellar tendon angle, which is affected by tibial translation – the change in relative positions of the articulating surfaces of the tibia and femur. Because of this, it can be surmised that ACL force depends on tibial translation as well. Many models of the knee that treat it as a hinge may inaccurately predict shear and ligament forces. Incorporating tibial translation into the Kernozek-Ragan knee model may yield a more accurate depiction of ligament forces during dynamic knee loading. In the current study, 20 participants stood on one leg, jumped over a short hurdle, and subsequently landed on the same leg. Thirteen digital cameras (180 Hz) recorded the motion, and force platform (1800 Hz) data were utilized to determine the landing phase. Inverse dynamics and static optimization were used to obtain estimates of muscle forces and ACL tension. These data were analyzed to estimate ACL tension as a function of time with and without tibial translation. Statistical differences were determined with paired t-statistics with an alpha of 0.05. There were differences in peak ligament force of approximately 50%

UR.16 The Deutschland Drive From Guttman to Gold: A Case Study of the 2012 German Women's Paralympic Basketball Team

Hannah Mueller
Advisor: Patricia Ardovino

When we imagine an elite athlete, we often picture a person who has set high goals, made big sacrifices, and has pushed themselves to win a gold medal at the Olympic Games. We seldom imagine a woman, let alone a woman who uses a wheelchair. Athletes with disabilities and Paralympians are often overlooked and have a unique journey. This research will explore the journey of the women who competed on the wheelchair basketball team and won the gold medal at the 2012 London Paralympics. These are the women from the German National Team. Both qualitative and quantitative research methods will be used to investigate motivation, socialization, and serious leisure. The quantitative method will be a survey called the Reason for Participation Questionnaire (RPQ). The RPQ will reveal information regarding the motivation to play wheelchair basketball. Qualitative data will be collected by implementing all six elements of a case study methodology. Archival reports, documentation, and physical artifacts will include game films, newspaper articles, and personal photographs. Personal interviews of the athletes will compliment observations made during team practices. Results from this research, while not generalizable, will offer deeper insights to the socialization process for women with disabilities, their participation in serious leisure, and their motivations. These results will add to the growing body of literature in the field of Therapeutic Recreation and Leisure Studies.

UR.17 Ghana: Investigating the Arts and Fighting Modern Day Slavery

Eric Busse
Advisor: Beth Cherne, Ph.D., Theatre

This research was inspired by the work of Free the Slaves and previous research regarding the potential for utilizing theatre as a catalyst for social justice. “Ghana: Investigating the Arts and Fighting Modern Day Slavery” was successful in understanding how Challenging Heights, an organization dedicated to eliminating the trafficking of child labor in the Lake Volta region of Ghana, has successfully utilized traditional Ghanaian dance, drumming and performance as a mechanism for the rehabilitation of rescued child slaves. This research was also successful in understanding how these traditional art forms are being used to help educated Ghanaian citizens about the realities of child slavery and other forms of human trafficking. The research included an experiential study of Ghanaian performance at the Dagbe Cultural Center and a qualitative exploration of Challenging Heights which included the study of its rescue missions, rehabilitation center and the Challenging Heights School.

UR.18 Poetics and the Natyashastra: An Investigation into Cross Cultural Potential in Dramatic Storytelling

Justin Cooke, Eric Busse
Advisor: Beth Cherne, Ph.D., Theatre

Our studies as UWL Theatre students have emphasized the teachings of ancient Greek thought regarding theatre, utilizing Aristotle’s Poetics as a foundation for the creation of effective drama. However prominent directors like Anne Bogart and Tadashi Suzuki highlight a shift in contemporary theatre which questions whether or not the formula set forth by the Poetics is the only way to effectively execute dramatic storytelling. As theatre artists, this shift led us to question what other aesthetic models may exist for the creation of theatrical art. This thought led us to the Natyashastra, an ancient Sanskrit treatise on performance and aesthetics, comparable to the Poetics in significance and magnitude. In order to better understand the Natyashastra and the ways in which it is both comparable to and distinctive from the Poetics, as well as researching how this comparison can inform our work as artists, we traveled to the state of Kerala, India where we experienced Kathakali, an ancient form of Sanskrit dance drama that is still performed today. Kathakali combines physicality, music, and singing to tell its story. By emphasizing body language in relation to music, this form of storytelling eliminates the need for dialogue. Our research explores the possibilities residing in the potential for cross-cultural multimodal dramatic storytelling.

UR. 19 Wisdom of the Ancients

Hayden Troy
Advisor: Timothy McAndrews, Ph.D., Archaeology

What do farming techniques utilized in the high Andean *alitplano* and the lowland river valleys of the upper Mississippi have in common? Both areas show evidence of a type of agriculture known as raised field farming. This type of high-yield, frost resistant farming potentially formed the backbone of two vastly different cultures, the politically complex society of Tiwanaku in the Andes and the less complex society of the Oneota in western Wisconsin. These technologies proved so beneficial to these past societies that modern archaeologist are currently working in Bolivia and Peru to recreate some of these field systems and study their benefits. This study seeks to augment that research by trying to understand what level of political complexity was required to create and operate these field systems. Through statistical analysis we can see whether there is a distinct difference in field size and complexity between the raised fields of the Tiwanaku and Oneota. This in turn gives a better picture of how these fields should be run and operated in a modern context and whether or not they are beneficial for small scale usage.

UR.20 A Cross Cultural Examination of Sustainability: From Amazonian People to Buddhist Monasteries

Michael Vogt
Advisor: Samuel Cocks, Ph.D., Philosophy

The modern movement towards a more and more Sustainable existence is wholly necessary, and is no longer a choice but a necessity. But what is Sustainability? What does it mean to a man living on an island in the middle of a river in the dense Peruvian Rainforest? What about the illegal gold miners poisoning that very river? Does the immediate profit outweigh the detrimental effects on the ecosystem? And what do the conservationists that research the area think might be the solution? Can we begin to draw respectable parallels between the "Green Movement" and Ancient Chinese Buddhism? What can we learn from the Monks seeking refuge in the foothills of the Phoenix mountain range? How exactly does philosophy, be it Buddhism or Sustainability, physically manifest itself in the world around us? I set out a year ago to go find these answers, travelling to opposite ends of the Earth with video camera and notebook in hand. Today, I have returned with experiences to last a lifetime, answers to the above questions, as well as footage of my interviews and the settings in which they took place. It would be my pleasure to share my findings with all interested, and hope that together we can continue the conversation on global sustainability for the sake of tomorrow but more importantly for the betterment of today.

UR.21 Civic Engagement: La Crosse, WI Rotary Lights

Karin Johnson
Advisor: Jo Arney, Ph.D., Political Science and Public Administration

This case study examines civic engagement in the community of La Crosse, Wisconsin. It is analysis of an event, La Crosse's Annual Rotary Lights, which brings together numerous community nonprofits. The study seeks to understand why and how organizations participate in this activity of civic engagement. In addition, the study seeks to measure of network connectedness of the community's nonprofits involved in this single event. A survey model is used to determine the why, how, and when organizations became involved in the Rotary Lights. A network analysis was completed to demonstrate the strength of relationships between the participating nonprofits. Research has shown that direct network ties are often as strong as ties created between two actors and their common connection. The resulting network analysis map shows the interconnectedness of organizations involved in one single instance of civic engagement. The author makes a case for the importance of events and organizations that bring together community non-profits into a tighter network and the why organizations seek to participate in activities of civic engagement.

UR.22 Service Learning From the Perspective of Community Partner Organizations

Joel McReynolds
Advisor: Jo Arney, Ph.D., Political Science and Public Administration

Requiring students to engage in service learning, volunteering as part of a class grade, is often seen as beneficial to campuses and students, but the costs and benefits to the community organizations should also be measured. How the community organizations receiving student volunteers feel about the partnership is critical to understand if the relationship is to be successful. Past studies have explored student and institutional perceptions of service learning partnerships, but few have asked the community organizations how they feel. Through a qualitative study, fueled by casual interviews, the general trends and perceptions of partnering organizations can start to be analyzed. How the

organizations feel about their interactions with student volunteers and other viewpoints can be collected. The current relationship of the University of Wisconsin - La Crosse and its community partners can be evaluated, with the possibility of recommendations for future improvement. Talking to the organizations that are receiving the student volunteers will help paint a new picture of the concept of service learning.

UR.23 Buna: A closer look at Ethiopia's Changing Coffee Market

Alex Stroffregen
Advisor: Ray Block, Ph.D., Political Science

Ethiopia is the birthplace of coffee, and its production and consumption in the region predates recorded history. The year 2008 marked a pivotal shift in how coffee is produced and exported in Ethiopia. This happened as the result of the Ethiopian Government taking control of the country's coffee exports through the creation of the Ethiopian Commodity Exchange (ECX). This exchange trades coffee alongside other commodities, like beans and grain, in a way that gives farmers access to international market prices. This change was accompanied by a new law that requires all coffee be traded through the ECX or be processed through government run mills, effectively federalizing the coffee industry. Since this shift farmers have done well, however, the international price of coffee is nearing an all-time high. It remains to be seen what impact a drop of international market price would have on individual farmers. The biggest drawback of this new system is that it dissolves direct trade relationships between western roasters and farming cooperatives, a growing movement in specialty coffee to build relationships to ensure quality coffee and equitable pay for farmers. My research will be gathering primary sources at every level of the supply chain, from growers, politicians, and exporters in Ethiopia to gain a better understanding of what impact federalizing this commodity will have on the economy, culture, and people of Ethiopia. Upon my return I will continue up the supply chain, by interviewing specialty roasters who have previously held partnerships with cooperatives in Ethiopia to study what impact the ECX will have on the US Specialty Coffee Market. I plan to publish my findings in a coffee industry trade publication, and present at the Annual Celebration of Student Research and Creativity conference.

UR.24 "I'm Gay and I'm going to Play": A Qualitative Study on How Gay and Lesbian Athletes Choose to disclose their Homosexuality to their Teammates

Emily Rauscher
Advisor: Mike Tollefson, Ph.D., Communication

The process of coming out is not only an external communication phenomenon, but also occurs internally. Much research exists on experiences of gay or lesbian athletes within the sport and on professional athletes who identify as gay or lesbian, but little exists on a younger age group and their initial process of disclosing their sexual identification to those on their team. Gay or lesbian athletes face a risk of negative consequences, such as homophobic discourse or violence, when disclosing their sexual identity (Engstrom & Sedlacek, 1997; MacLachlan, 2012). The current study sought to determine what factors influenced the individual athletes' decision to disclose their gay or lesbian sexual identification to their teammates, in addition to what repercussions resulted. Six interviews were conducted with current or past athletes who have come out identifying as gay or lesbian. Results showed that there were several political, religious, environmental, and interpersonal factors, which impacted the decision mutually. Participants experienced a range of consequences ranging from threats of violence to positive responses. The findings of this study showed that each person has their own value for certain factors over others, and they can exist mutually.

UR.25 U.S.-Argentine Relations in the Cold War: Operation Condor and the Argentine Nuclear Program, 1976-1983

Robert Belle
Advisor: Victor Marcias-Gonzalez, Ph.D., History

This project will focus on United States-Argentine relations in the Cold War, analyzing Operation Condor in the 1970s and 80s and how the Argentine military used the aid the U.S. provided through that program to fund a secret nuclear weapons project that the U.S. subsequently worked to destroy. Operation Condor was a campaign of political repression and domestic terrorism involving political assassinations and intelligence operations, in which South American right-wing dictatorships collaborated. Argentina, Bolivia, Brazil, Paraguay, and Uruguay worked together to eradicate Soviet

and leftist influence in the region. The U.S. provided technical support until 1978, and then again during the Presidency of Ronald Reagan in 1981. Claiming to research nuclear power generation in the aftermath of the Arab oil embargo, some of these countries repurposed American resources to develop nuclear weapons. This alarmed the U.S., so much that historian Richard Thornton claims that the U.S. instigated the Falkland Islands War (1983) in order to discredit the military dictatorship in Argentina, so that the incoming civilian government would mothball Argentina's nuclear weapons program. This project will assess U.S.-Argentine and British relations at a time of growing commitment to nuclear nonproliferation. This project will use documents from the U.S. Office of the Historian, published as the Foreign Relations of the United States Papers. This evidence will be contextualized using the revisionist historiography of the Cold War

UR.26 Public Perception of Severe Weather Risk

Michael Heing
Advisor: Colin Belby, Ph.D., Geography and Earth Science

This research project used online and paper surveys, archival research, and interviews to analyze how severe weather alerts are issued and how well the public understands them. The purpose of this project was to expose gaps in severe weather warning dissemination, patterns in misconceptions of severe weather alerts, and explore the options available for resolving those issues.

UR.27 On the One-Way Street Problem

John Gallagher
Advisor: Yan Huiya, Ph.D., Mathematics

Consider a town in which some, but not all, of the streets are one-way and suppose we wish to assign a one-way direction to the remaining two-way streets. We wish to do this in a manner that preserves the property that it is possible to reach any point in the town from any other point. We ask the question: is there an efficient way to list all of these one-way street assignments? In graph theory terminology, this problem is equivalent to the enumeration of all the strongly connected orientations of an orientable labeled mixed multigraph. In this talk, we present a constructive algorithm for generating all such orientations. Basic graph terminology is introduced and concepts from algorithm analysis are discussed whenever appropriate. With our algorithm in hand, we address the various questions associated with the One-Way Street Problem as well as introduce some possible applications to real-world traffic control.

UR.28 Lead Contamination in Passage Island Soils and Rock Pools, Isle Royale National Park

Steve Oxley
Advisor: Colin Belby, Ph.D., Geography and Earth Science

The purpose of this study is to determine the extent lead-based paint has leached into the soil and rock pools surrounding the Passage Island Lighthouse complex, located in northeastern Isle Royale National Park in Lake Superior. A pilot study of Pb soil contamination on Passage Island, commissioned by the United States Coast Guard in 2001, showed soil lead levels ranging from 417 to 41,040 parts per million (ppm), well above the United States Environmental Protection Agency's hazardous Pb standard of 400 ppm. In 2012, 588 soil samples (0-5 cm) and 58 rock pools samples were collected over ~2 hectares around the lighthouse complex. In 2013, an additional 356 soil samples (0-5 cm) were collected from areas that extended further away from the complex, as well as from areas of interest determined from the 2012 data. The samples were brought to the University of Wisconsin-La Crosse where they were dried and ground to pass through a 2mm sieve prior to analysis via X-ray fluorescence to determine Pb concentrations. With some exceptions, soil and rock pool sediment results show a spatial pattern of highest Pb concentrations near the lighthouse complex, decreasing with distance away from the structures. Based on the 2012 samples, 85% of soil samples have Pb concentrations exceeding 400 ppm, with 53% having concentrations exceeding 1200 ppm. Rock pool samples show a similar pattern, with 46% having concentrations of 400 ppm or higher and 24% exceeding 1200 ppm. Samples collected in June 2013 will improve the spatial resolution our Pb contamination map. Terrestrial LiDAR data collected on the second trip will provide topographic information for establishing three dimensional flow pathways to better understand Pb distribution patterns. Results from this study will inform the National Park Service in preparation for clean-up and restoration efforts at the Passage Island lighthouse complex.

UR.29 Their Only Chance at Happiness: Religion as a Factor in the Assimilation of Jewish Refugee Children from the Kindertransport in Great Britain

Kelly Timmerman
Advisor: John Grinder, Ph.D., History

The Kindertransport provided an escape for 10,000 children – the majority of them Jewish – to Great Britain from Nazi annexed territory beginning in 1938, until the start of World War II on September 1, 1939. Although they were saved from the horrors of Germany's anti-Semitic government, such children were forced to quickly assimilate themselves into the culture of a country they had never been to, often with new families they had never before met. While some were able to find homes with Jewish Britons, the majority of the Kindertransport children were sent to homes that, however loving, had no idea how to raise an already traumatized child in the ways of Judaism. As a result, many Kinder, regardless of their upbringing in the Greater Reich, turned to religion as a way to cope with the new stress of everyday life. Because Jewish refugees all over Great Britain were particularly desperate to be accepted in their new "home," many children, from every level of orthodoxy, severed ties with Judaism – often opting to convert to Christianity in its stead. Such an outcome feared by Jewish religious leaders from both England and the continent, created a small-scale cultural and religious "war" within Britain. This paper carefully examines the effects of religion briefly mentioned above on those transport children taken in by British families – an aspect of the assimilation of Kindertransport children never truly studied on its own. Through the analysis of the diaries, memoirs, and papers of both transport survivors and coordinators, as well as a variety of secondary sources on the subject, I have concluded that those children who decided to embrace the religion of their new English families – regardless of whatever powers advised against it – were most often the children who were happier in and better assimilated to the culture around them.

UR.30 The Big Jump: Skiing and Heritage in Westby, WI. 1950-1959.

Jordan Marshall
Advisor: John Grinder, Ph.D., History

In my paper, I examine the cultural and social aspects of ski competition in Westby, WI in relation to the strong Norwegian heritage of the town's residents. With the influx of Norwegian immigrants to America in the 19th century came knowledge of skiing for practical purposes as well as the memory of exciting ski competition. In this way the sport of skiing made its way to the Midwest. Norwegian immigrants and their children made up the majority of organized club members in the first half of the century. After World War Two others joined in the competitions. Around the same time, in the late 1940's, Westby's ski tournament became international as ski jumpers from around the world came to practice and compete on its hill. In this time the community of Westby and the Snowflake competition itself never lost its Norwegian influence, to which references remain constant in literature surrounding the event. The competition became Westby's most important, a time when the community was overrun with visitors and local businesses had an opportunity to gain clientele and recognition. Even today the tournament has retained a large following. In my paper I argue that Westby's ski tournament was an important way in which third-generation Norwegian immigrants forged an ethnic identity in the rapidly changing world of the 1950's. Because ski jumping was quintessentially Norwegian in nature, town residents used the tournament as a cultural celebration and a way of retaining ethnic values that still remained compatible with mainstream culture. Moreover, the tournament was an important resource for a relatively poor rural town. In this way Westby residents used their culture as a commodity to revitalize their town and develop a new understanding of their identity.

UR. 31 Contact Period Rock Art: GIS Analysis of Social and Spatial Interactions of Australian Aboriginal Peoples in Northern Territory, Australia

Yolona Ngandali
Advisor: Constance Arzigian, Ph.D., Archaeology

The native Aboriginal peoples of the NW Northern Territory of Australia are prehistorically a hunter-gatherer society. There is no archaeological evidence of monumental architecture, very little material remains, and no written language. They have strong connections to the landscape and the stories of their ancestors, which they express through rock art painting. European contact during this period changed social traditions and displaced many groups. The purpose of this research is to use archaeological data and Geographic Information Systems (GIS) methods to show various patterns and

spatial relationships involving European contact and Aboriginal rock art paintings within the Northern Territory. GIS is a powerful tool for visualizing, analyzing, and interpreting data. Analytical methods using archaeological, historical, ethnographic accounts, and GIS data models offer new ways of extracting and interpreting social and spatial structures. Mapping European explorer paths, distance to rivers, locations of spiritually significant places, and natural landscape barriers provide insights into how people interacted with each other as Europeans moved into Australia. Archaeology in Northern Australia has a long history of spatial and social cultural reconstruction and the inclusion of GIS in this project contributes to a wider understanding of the regional landscape and the complex relationships that arise during European contact.

UR.32 Visualizing Wisconsin's Prehistory with Digital Media

Yolona Ngandali
Advisor: Constance Arzigian, Ph.D., Archaeology

Relevance and accessibility to the public are key issues in archaeology that need attention and practical applications. Sharing information via Internet through interactive website design can bridge the gap between archaeologists and people outside the profession. In this project technical data results are transformed into interactive elements to produce educational and public-friendly web content. Visual media can encourage the public to find a connection to the past that drives the way they think about the future. The web content is based on archaeological excavations and laboratory analyses conducted in the Upper Mississippi Valley. Established evidence about the function of sites, the range of tool production activities, subsistence activities, and evidence of trade from other regions are incorporated into a comprehensive digital exploration of the daily life of Wisconsin's prehistoric farmers. The website will showcase the archaeological methods from excavation to analysis emphasizing the interactions of culture and environment with text, photo galleries, infographics, E-books, interactive diagrams, and 3D models. Interactive digital media promotes public interest, participation, and comprehension of archaeological concepts. Incorporating social media and feedback options will instigate communicative discussions and build a stronger dialogue between archaeologists and the community.

UR.33 The Ingredients of Success: A Positivistic Approach to Black Students Graduation at the University of Wisconsin-La Crosse

Christian Wendland
Advisor: Laurie Cooper Stoll, Ph.D., Sociology

The project is a qualitative exploration of the pathways Black students take in order to reach graduation. Uncovering the ingredients most vital to their academic success at UW-La Crosse was done through in-depth interviews with eight recently graduated, or expecting to graduate, Black seniors. This research explores the relationship between motivational factors and academic success. Themes of identity development, adaptation strategies, and racial consciousness are woven into the paper. The project is an effort to locate where and how these students position themselves within the framework of the university. This insight into Black students' successful graduation is to refine the tools administrators, faculty, and students use in addressing diversity related issues at UW-L, specifically the graduation gap between Black students and the larger student body. The results offer insights into how a diverse learning environment beneficial to all students can best be created.

UR.34 Examination of the Relation between Spatial Organization and Social Stratification at Kahun

Casey Hintz
Advisor: David Anderson, Ph.D., Archaeology

While the pyramids of Egypt have long been studied, less attention has been focused on the people who built them. Through examining the spatial organization of houses at the Middle Kingdom pyramid town of Kahun, relative social statuses amongst the non elite and the effect status has on a culture can be studied. There are approximately 170 houses that are in good enough condition to be used in a data set. Variation in house dimension and spatial organization indicate the presence of a complex social hierarchy The differences found in dimensions and the spatial organization indicate a varied social hierarchy amongst people of the Middle kingdom. This research contributes to the overall understanding of how people both past and present organize themselves based on their social status.

UR.35 Animal Cemeteries and Roman Egypt: A Spatial Analysis of the Ibis Cemetery in Cemetery E, Abydos, Egypt

Madeline Leines
Advisor: David Anderson, Ph.D., Archaeology

Cemeteries have always been an important part of the religious lives of ancient Egyptians. They served as a means to ensure one's induction in to the afterlife, as well as a reflection of popular beliefs and practices. Many of those interred were mummified, especially if of high religious or administrative standing. Millions of mummified animals found in specifically dedicated cemeteries show that this practice was not limited to humans. In this paper, I examine an ibis (a sacred Egyptian bird) cemetery discovered at Abydos in 1912-1913. I conduct a spatial analysis of its contents and layout by using primary quantitative calculations of original excavation data to create a digitized AutoCAD map. This allows me to analyze trends and patterns visible in the data that help to explicate the growth of animal cults in the Roman Period of ancient Egypt. This spatial analysis adds to the growing body of knowledge about animal cemeteries, as well as giving insight into the effects of foreign-imposed changes upon a society such as ancient Egypt.

UR.36 The Causes and Correlates of Early vs. Late Onset Criminality: A Life-Course and Self-Control Theory Analysis

Lizabeth Remrey
Advisor: Nicholas Bakken, Ph.D., Sociology

With over 12 million arrests made in 2011, it is no wonder that determining what factors cause criminal offending is of great interest to researchers, government officials, and the general public alike. For years, researchers have been investigating the onset and frequency of criminal behavior with regards to the age of the offender, with research often indicating that offending begins in early to mid-adolescence and peaks in early adulthood. A far less researched population of offenders are those in the adult-onset category, or those that do not follow the typical age-crime curve. This research examines this under-researched area by evaluating risk factors for early (16 years or younger) and late (17 years or older) onset criminality. The results are reviewed through the lenses of Life-Course and Self-Control theories in order to determine the correlates of early risk factors that predict either early or late criminal onset. Using the Cambridge Study in Delinquent Development (CSDD), logistic regression was used to examine the relationship between the self-control and life-course variables with age of onset of offending. Results indicate that the self-control variables, specifically concentration and lying, were the strongest factors predicting the onset of criminal offending; indicating that Self-Control Theory may provide a more suitable explanation for the onset of criminal offending. Policy implications are discussed.

UR.37 Social Stratification amongst Non-elite Housing of Grid 12 at El'-Amarna, Egypt

Taylor Brehm
Advisor: David Anderson, Ph.D., Archaeology and Mark Chavalas, Ph.D., History

In early Egyptian states, prestige has often been considered an attribute limited to elites because of their notably physical presence amongst society. This creates a two-tiered image of either wealthy or non-wealthy individuals. However, new contextual analyses of architecture and material culture at the New Kingdom site of el'-Amarna suggest the rise of a middle class, equating prestige existed outside the elite sphere. This implies non-elite people were able to achieve status, usually done by emulating status icons. This paper defines the markers of high status in elite houses and examines how these are reflected in non-elite housing in order to discuss social differentiation in non-elite dwellings. A combination of architectural and artifactual elements in some houses over others indicates variations in status. The contribution of this research will eliminate the black and white image of elite/non-elites and give a better understanding of different statuses at el'-Amarna.

UR.38 Colorism: Perceptions of Beauty

Brittney Long
Advisor: Christina Haynes, Ph.D., Women's, Gender and Sexuality Studies

This paper seeks to examine the ways that colorism influences perceptions of beauty among Egyptian women. My research investigates how negative stereotypes of Black beauty and femininity in media depictions and the country's racial history influence the extent to which these women identify themselves as Black, African, or Egyptian. In this study, I analyze the narratives of 6 Egyptian women to examine how these women develop their perceptions of femininity. I argue that these women consciously and unconsciously influence the ways that Egyptian women construct their sense of self.

UR. 39 Adolescent Sexual Debut, Religiosity, and Depression

Samantha Gregory
Advisor: Dawn Norris, Ph.D., Sociology

This study explores the parameters of religiosity as an intervening variable in the relationship between timing of sexual debut and depression among adolescents. This relationship is explored using data from the National Longitudinal Study of Adolescent Health, a nationally representative sample of adolescents in grades 7-12 in the United States during the 1994-95 school year. Previous research has shown that early sexual debut increases depression among adolescents. Greater religiosity is found to be related to later sexual debut and lower levels of depression in the adolescent population as well. Effects of timing of sexual debut on depression among adolescents will be evaluated, and the extent to which religiosity mediates this relationship will be explored using OLS regressions.

UNDERGRADUATE EXHIBIT PRESENTATION ABSTRACTS

Valhalla Hall:
9:00 am-10:45am

E.1 Hindeloopen Painting Style

Brechtje Bennett, James Bennett
Advisor: Jennifer Terpstra, M.F.A, Art

While researching painting styles we came across a picture of a painted skate in the Hindeloopen style, a style of Dutch painting dating back to the 16th century. As we were researching this painting style we came across a workshop that is offered in Hindeloopen, the Netherlands to learn the technique and mixing of colors of this method of painting. We have become increasingly interested in this historical style of painting. By going to Hindeloopen and learning the technique of the Hindeloopen painting first hand we are in essence learning art history by studying old methods of painting and mixing of colors which we can then share with others. By taking a workshop we will be able to practice under guidance and learn the various recipes for mixing the colors. This new skill set will allow us to produce sample work for an introductory workshop that we would like to hold at UWL. We have already spoken with and received permission from Jennifer Terpstra to conduct the workshop in the painting studio. We have also contacted the Veterans Administration Medical Center in Tomah, WI to hold a workshop there and have received permission. Our research goal is to establish a clear understanding of the method, mixing of colors, as well as the historical preservation of the Hindeloopen painting style for future generations, by studying and creating painted objects as a record of this authentic method.

E. 2 H_2O, an Autobiography

Natalie Renier
Advisor: John Ready, B.S., M.A., M.F.A., Art

The most precious resource, water, is essential to our everyday lives, but is often taken for granted. Breaking water down into its simplest form reveals the unique properties that arise from hydrogen bonds making life on Earth possible. My research investigates the story of water through the dual lenses of art and science. The structure and function of water give rise to exciting characteristics such as cohesion, adhesion, surface tension and capillary action, which are all critical for biological life. These properties are explored and used through the use of cyanotyping and Suminagashi art techniques in order to most accurately convey water's essence. Cyanotyping (blueprinting), originated as a form of photography used in scientific field research to portray specimens with precision and accuracy. Suminagashi uses pigment to visualize the movement and flow of water through the utilization of surface tension. Repellent inks are floated onto a tray of water and picked up with paper, thereby creating a record of the motion while applying the knowledge of water's own physical properties to create an intriguing visual image. The combination of these two processes on a large scale gives the viewer a sense of immersion and awareness of the human connection with fluids, while providing an excellent surface for drawing. These works are supplemented with imagery drawn from scientific illustration, cartography and observation of specimens dependent on water. Presenting this story through the perspective of water relates to a broad audience while exploring an innovative take on traditional methods. Imagery works to educate and inspire resulting in compassion and understanding of water's significance to life, while exemplifying the beauty of this natural phenomenon. The drive for my work is fueled by passion for the relationship between artistic and scientific perspectives on a greater scale potentially inspiring revolutionary thinking and sustainability.

UNDERGRADUATE EXHIBIT PRESENTATION ABSTRACTS

Valhalla Hall:
11 am-12:45pm

E.3 The Role of Disability: Physically Disabled Students' Friendships

Dana Schulte
Advisor: Sara Docan-Morgan, Ph.D., Communications

The number of persons in the U.S who report having a disability is continuing to rise (Malian & Nevin, 2000). Much of the past research surrounding the topic of disability looks at the negative stigma associated with disability (Emry & Wiseman, 1987), initial perceptions and interactions between people with disabilities and those without (Braithwaite, 1990) as well as relationships between able-bodied and disabled persons. However, oftentimes the research does not represent the disabled partners' perspective (Braithwaite & Harter, 2000). This study extends the research on people with disabilities by obtaining the perspective of college students with physical disabilities and learning how they communicatively manage their disability in long-term friendships. Specifically, the researcher applied the relational turning points theory and relational dialectics theory to better understand the role the disability plays in friendship. Eight individual interviews were conducted with physically disabled college students about their friendships. These interviews were coded and analyzed by the researcher using thematic analysis. Results showed that the majority of the turning points described by the students centered on the disability itself. Results also showed that students with physical disabilities most commonly faced dialectical tensions while trying to balance the 'openness-closedness' tension with friends.

GRADUATE STUDENT ABSTRACTS

GRADUATE POSTER PRESENTATION ABSTRACTS

Poster Session A
Valhalla Hall: 9:00am-10:45am

G.1 A Physical Activity Program for Individuals with Parkinson's Disease

Benjamin Ceder, John Greany, Erin Hussey
Advisor: John Greany, Ph.D., Physical Therapy

Introduction and Background Parkinson's disease (PD) is a progressive neurological disorder characterized by bradykinesia, rigidity, and postural instability. Literature has shown that exercise programs have been effective at delaying the detrimental signs of the disease progression. The purpose of the current study was to evaluate the effectiveness of a University based fitness program on the balance, strength, confidence, and endurance of participants with PD. Materials and Methods Twenty-seven participants (73.9 + 8.0 yrs; 17 males, 10 females) with PD attended a campus based exercise session two times per week for 13 weeks. The program emphasized aerobic fitness, muscular strengthening, and balance exercises. Pre- and post-test results were obtained for the following clinical tests: 6-Minute Walk Test (6MWT), Timed Up and Go (TUG), Dynamic Gait Index (DGI), Five times sit-to-stand (5xSTS), single leg stance (SLS), and Activities-Specific Balance Confidence Scale (ABC). Temporal-spatial gait variables were obtained from a GaitRite system. Results Participants improved in the 6MWT (29.5±51.5m), 5xSTS (4.2 ± 8.3 seconds), 1RM UE (15.3 ±18.3 lbs), 1RM LE (30.4 ± 46.1 lbs), and SLS on the left side (12.1 ± 12.1 seconds). Additionally, participants displayed improvements in standard gait outcome measures as well. Changes were observed in velocity (0.075 ± .03 m/s), cadence (4.7 ± 1.6 steps/min), and double support time (0.029 ± 0.047 sec). Discussion Results indicate that a University based physical activity program for individuals with PD have demonstrated a positive effect on a number of gait parameters and balance measures. Because of the validity and good psychometric properties of the tests utilized they relate to functional gait and balance, the significant improvements observed throughout the course of the program may indicate an improvement in safety and overall function for this population.

G.2 Designing and Implementing a Zumba Gold® Program for Youth

Annalise Doyle
Advisor: Susan Murray, Ed.D, C.C.L.S., C.T.R.S, Therapeutic Recreation, Stephen Lewis, Ph.D., CTRS, Therapeutic Recreation, Nicholas Bakken, Ph.D., Sociology

The purpose of this project was to apply program design and evaluation typifying the therapeutic recreation process as psychosocial intervention by: (a) designing a four week bi-weekly Zumba Gold® class for youth, (b) implementing the class at a La Crosse afterschool program as UW-L grant-funded community service, (c) evaluating the program to determine its effectiveness by measuring performance skill of Zumba dance moves, and (d) promoting the therapeutic outcomes of Zumba® as fitness in a refereed manuscript submitted to a therapeutic recreation journal. This poster presentation reveals achievement of this 'educational leadership' grant by securing Zumba instructor certification, applying the real-world APIE process common to action therapies (assess, plan, implement, evaluate), and teaching and learning with school-age girls to 'join the party' of fitness and FUN.

G.3 An Examination of Teachers' Acceptance to Consultation with School Psychologists

Lucas Gerber
Advisor: Robert Dixon, Ph.D., NCSP, Psychology

There is a considerable need to identify and implement interventions to help students succeed within the classroom. The effectiveness of these interventions often depends greatly on the consultation relationships between the school psychologists and teachers within the schools. This study examines the characteristics that teachers find most effective in school psychology consultation in order to better meet the problem solving needs of the teachers. Implications for educators and school psychologists will be discussed.

G.4 Spatial Comparison of Two Populations of the Invasive Gastropod, Bithynia tentaculata, and its Waterfowl-killing Parasitic Hitchhikers

Christopher Glodosky
Advisor: Gregory Sandland, Ph.D., Biology

Invasive species have the capacity to rapidly alter the native ecosystems in which they establish, resulting in billions of dollars in control expenditures each year. In 2002, the upper Mississippi River (UMR) was invaded by the faucet snail, Bithynia tentaculata. With this snail came four species of digenetic trematodes which have been implicated in the death of over 100,000 migratory waterfowl since their collective arrival. While this pattern is disconcerting for the UMR, the spread of this invasive snail into new environments may have widespread consequences for susceptible waterfowl populations in other locations. To begin to assess this possibility, we conducted field collections from two sites where there have been reports of both B. tentaculata and waterfowl mortality. Laboratory procedures were employed to compare the snail populations and quantify the parasites infecting them. Our results indicate the presence of two waterfowl-killing trematodes (Sphaeridiotrema pseudoglobulus and Cyathocotyle bushiensis) in the UMR and one waterfowl-killing trematode (C. bushiensis) in Georgetown Lake (Butte, MT). Furthermore, these results 1) provide evidence for the widening distribution of B. tentaculata and at least one of its parasitic hitchhikers, and 2) allow for the comparison of newly-invaded ecosystems to those in which B. tentaculata has resided for a number of years.

G.5 Becoming a Certified Therapeutic Riding Instructor as a Specialized Competency for a Supervisory Recreation Management Position in Equine-Assisted Therapy

Margaret McDonald
Susan Murray, Ed.D, C.C.L.S., C.T.R.S, Therapeutic Recreation

The purpose of this educational leadership project was to (a) acquire certification as a therapeutic riding instructor as a specialized competency for a Recreation Management career as a service provider of equine-assisted therapy and, (b) create an instructor training manual as a community service for HorseSense for Special Riders, a La Crosse therapeutic riding center.

G.6 Traditional Balance Exercise and Tai Chi like Exercises to Decrease Falls Risk

Whitney Boehme, David Schimenz
Advisor: John Greany, Ph.D., Physical Therapy

Introduction: Falls are a major cause of injury and death in older adults. Therefore, decreasing falls risk is a high priority. Participation in activities that challenge visual, vestibular and proprioceptive balance systems can reduce an individuals' falls risk. In addition, tai chi has been shown to be an effective exercise to improve balance. The purpose of this study was to determine the effects a group balance program combining traditional and tai chi like movements on falls risk in older adults. Methods: Nine subjects (4 men, 5 women; 75.2 + 7.3 years) completed a 6-week balance program consisting of weekly 45 minute sessions combining traditional exercises with tai chi like movements. Outcome measures consisted of: single leg stance time, temporal-spatial gait variables, and a modified Activities of Balance Confidence questionnaire. Data were analyzed using paired T-tests and Wilcoxon rank sum tests (alpha=0.05). Results: 5 participants fell in previous year (55.5%); of those who fell, 2 were frequent fallers (22%). Significant improvements were found in single leg stance (eyes open) on the left (14.5 ± 13.2 sec), and (24.2 ± 34.7 sec) on the right. There was no difference in the average perceived balance score at the conclusion of the program however there was a significant mean improvement in confidence specific to bending over to pick up an item (14.4% ± 16.5; p=0.04). There were no significant changes in gait variables. Conclusions: These results indicate that a 6 week balance program for older adults may benefit participants in some areas of fall prevention including single leg stance with eyes open and confidence in balance and stability. Limitations of this study include small sample size, short class duration and restricted time between measurements.

G.7 Interrater Reliability of Two-dimensional (2D) Motion Analysis to Measure Infant Cervical Range of Motion

Emily Barske, Danialle Draeger, Katelin Keck, Emily Lockhart, Jamie Shervey, Kyle Stengel

Advisor: Kimberly Castle

Background/Purpose: Torticollis is a musculoskeletal condition involving a shortened sternocleidomastoid muscle resulting in asymmetries and loss of cervical range of motion (ROM). Physical therapy interventions are used to treat torticollis; however, there is currently no reliable clinical method of measuring cervical range of motion in infants. The purpose of this study was to examine the reliability of measuring cervical ROM with two-dimensional (2D) motion analysis. Methods: Eight markers were placed on a tightly fitted undergarment worn by infants, ages 3-7 months. Lateral cervical flexion in response to tilt in each side was digitally photographed in frontal plane. Still images extracted from overhead video captured transverse plane bidirectional cervical rotation. A pediatric physical therapist and six graduate students of physical therapy each digitally marked all photographs using the undergarment markers as reference points. Using ImageJ software, each individual analyzed ROM angles of both independently marked and physical therapist marked images. Inter-rater reliability was analyzed by determining the intraclass correlation coefficient (ICC) value for each ROM measurement using SPSS Version 21. The averaged single reliability was then calculated for the data marked individually, and for the data marked by the physical therapist. Results: Mean single reliability of examiners' measurement from previously marked angles was excellent (ICC=.97; ICC range= .80-.99). Mean single inter-rater reliability for each examiner's individually marked images was good (ICC=.89; ICC range=.39-.99). Conclusions: Examiners' measures of previously marked demonstrated excellent reliability when utilized to measure ROM with 2D motion analysis. Additionally, there was good inter-rater reliability between students and a clinician when utilizing 2D motion analysis to measure cervical ROM in infants.

G.8 Aging Effects on Limits of Stability and Visual Tracking

Geoffrey Betz, Ethan Lind
Advisor: Thomas Kernozek, Ph.D., Physical Therapy

Postural control loss may lead to falls in an aging population, which can be detrimental to one's health. Measures used in the clinic to assess balance (i.e. Berg, Tinnetti) have shown to be reliable when used with frail elderly, but when they are used with healthy adults a ceiling effect occurs. Our study examined younger and older adults completing limits of stability (LOS) and visual tracking activities. 59 subjects (18-87 y.o.) performed two postural control tasks. These participants were divided into 2 groups based on age 18-39 (n=31) and 40+ (n=28). Subjects completed two tasks that involved using visual feedback to control center of pressure (COP) and follow or move a target by shifting their weight while standing on two force platforms. Total LOS sway area was measured as well as the percent ability to accurately move their COP to push a target. Separate repeated measures ANOVAs were performed for each task to detect between group differences of sway direction and accuracy of visual tracking at different rates (alpha=.05). Differences occurred between groups when examining LOS ($F(7,399) = 3.11$, $p = .003$). An independent t-test was also run in order to determine differences in total sway area. Differences were found between groups ($t(50.179) = 2.502$, $p = .016$, older adult mean area = 291.30 cm^2 (sd=53.7), younger adult mean area = 322.6 cm^2 (sd=40.7)). Differences occurred between groups ($F(1, 57) = 957.107$, $p = 0.000$) and in visual tracking accuracy based on movement speed ($F(7,399) = 96.428$, $p = 0.000$). No interaction effect was observed between groups and speed ($F(7,399) = 1.09$, $p = .368$). This suggests that with age, the ability to incorporate visual feedback into postural control and limits of stability declines.

G.9 Differences in Dynamic Postural Control Asymmetry in Landing from a Barrier Jump between Anterior Cruciate Reconstruction (ACLR) Participants and Healthy Controls

Stephanie Lopez, Sarah Bootma, Sarah Leissring, Becky Heinert, Dian Hong, Robert Ragan
Advisor: Thomas Kernozek, Ph.D., FACSM, Physical Therapy

Anterior cruciate ligament (ACL) ruptures are common among active individuals with most opting for reconstruction (ACLR). Following surgery, rehabilitation focuses on strength, proprioceptive, and neuromuscular training to restore limb symmetry, especially the medial lateral control of the knee, thought to contribute to ACL injury. Studies show that after rehabilitation, these individuals demonstrate abnormal strength, proprioception, and movement patterns. Changes in single leg stability have also been reported but few studies have investigated differences in the symmetry of dynamic stability in healthy controls versus individuals post ACLR, hence the purpose of this study. Twenty-two controls (10 males) and 25 individuals post ACLR (9 males) performed a single leg jump over a hurdle, landing onto a force platform. Data were processed by calculating medial lateral (MLSI), anterior posterior (APSI), vertical (VSI), and dynamic postural (DPSI) stability indices.Limb symmetry index (LSI) was also calculated for each stability index by

dividing values for the non-dominant limb by those of the dominant limb for controls, or by dividing the involved limb by the uninvolved limb in the ACLR group, and multiplying by 100 to yield a percentage of symmetry. A two-way ANOVA was used to compare between groups and gender (α=0.05). LSI was different between groups for MLSI with 138.80±9.62 and 102.80±9.36 for control and ACLR groups respectively (p=0.01, effect size=3.79), indicating that healthy individuals demonstrated less limb symmetry when controlling medial lateral forces on their non-dominant limb with respect to their dominant limb as compared to the symmetry of the involved and uninvolved limbs in individuals post ACLR. Further work is warranted to determine if MLSI symmetry post ACLR is due to an increase in neuromuscular control of the involved limb or a decrease in neuromuscular control of the uninvolved limb in an attempt to create limb symmetry.

G.10

Poster Session B
Valhalla Hall: 11:00am-12:45pm

G.11 Identification of a Plant Specific Component of the Secretory Pathway using the Model Plant Chlamydomonas

Maryam Alhumaidi
Advisor: Anton Sandefoot, Ph.D., Biology

Secretion is the way of interaction between plant cells and the surroundings. In this proposal we will use some molecular cell biology approaches such as genetic screen based on insertional mutagenesis and PCR methods to identify genes that are involved in the secretory pathway in the model organism Chlamydomonas Reinhardtii. Chlamydomonas Reinhadtii is an ideal organism to doing a screen for secretory pathway because it is a haploid, unicellular, and has many proteins and genes that are homologous with land plants after making a genomic analysis. There are three specific aims we hope to achieve from this proposal which include firstly identify genes essential for secretion in Chlamydomonas. For the first aim, we will use Arylsulfatase enzymatic activity as a screenable marker together with a marker gene aphVIII. The second aim is identifying one or more candidate genes that are conserved in flowering plants and fully characterize the mutations in the genomic DNA of a mutant, and we will use several methods for that, which include for example TAIL-PCR, traditional PCR, and immunofluorescence microscopy. For final aim, we will investigate the physiology and cell biology of the candidate gene(s) to identify the precise role of the protein in the secretory pathway by using light microscopy along with genetically encoded fluorescent protein.

G.12 Anatomical Variations in the Extensor Hallucis Longus Tendon

Pamela Buntin, Britney Wandling
Advisor: Thomas Greiner, Ph.D., M.A.H.C.P., Physical Therapy

Introduction: The extensor hallucis longus (EHL) muscle originates from the anterior shaft of the fibula and interosseous membrane and inserts into the dorsal aspect of the base of the distal phalanx of the great toe (hallux). The muscle serves the action of extension of the hallux and the foot at the ankle. Several variants of insertion have been noted in previous research. A double tendon has been described as a variant in which two tendons arise from the EHL muscle belly and either both tendons attach at the typical location or a tendon to each the distal and proximal phalanx of the hallux. Other variants exist but are not as prevalent. Purpose: The purpose of this study was to describe the anatomical variations in the insertion of the EHL tendon during human cadaveric dissection and describe implications of such variants in clinical practice. Methods: We examined 24 lower limbs in 12 adult cadavers that were available for student dissection, focusing on the insertion of the EHL tendon. Results: A dual-insertion was present in 3/24 lower extremities (one unilateral finding; one bilateral), a double tendon existed in 4/24 lower limbs with insertion on both the proximal and distal phalanx of the hallux (bilateral findings), and 1/24 with insertion on the first metatarsal, proximal

phalanx of the hallux, distal phalanx of the hallux, and fusion to extensor hallucis brevis tendon. Conclusion: We noted a variant not reported in the literature since 1871. The dual insertion tendon variant observed inserted on the distal and proximal phalanx of the hallux. The function of the dual insertion is the capability to isolate extension at the interphalangeal joint of the hallux, but isolated motion at this joint is not necessary for lower extremity function. Therefore, although several variations and attachments exist to the hallux, the clinical significance is unclear.

G.13 Anatomical Variation of the Flexor Digitorum Longus and Flexor Hallucis Longus Tendons in the Foot

Samantha Bielen and Kelsey Case
Advisor: Thomas Greiner, Ph.D., M.A.H.C.P., Physical Therapy

Introduction: The flexor hallucis longus (FHL) and flexor digitorum longus (FDL) are toe flexors. The FDL opposes the extension moment from ground reaction forces during gait. A fusion may exist between the tendons of the FHL and FDL; however, this fusion, if present, is variable and has the potential to affect gait biomechanics. Particularly, during push off, contraction of the FHL may be influenced by the FDL, causing limited hallux extension resulting in ineffective arch stabilization. Extension of the hallux at the metatarsophalangeal joint is necessary during gait, creating tension on the plantar fascia, elevating and stabilizing the medial longitudinal arch. The loss of this arch stability can cause the loss of ideal function. Methods: Variations of the fusion of the FDL and FHL tendons were observed in 37 human cadaver lower extremities used for student dissection. Results: A fusion of the FDL and FHL was found in 20 of the lower extremities, whereas 17 of the lower extremities found no fusion between the FDL and FHL. Four of the fusions found connected the FDL and FHL before the FDL splits to the individual phalanges. Clinical Relevance: Fusion between the FHL and FDL may alter gait biomechanics based upon fusion location. A fusion occurring from the FDL to the FHL prior to the FDL splitting to the distal phalanges may influence the FHL contraction, resulting in less extension of the hallux. Clinically, this has the potential to result in arch collapse to a certain degree. Potentially, these patients may not benefit from typical physical therapy rehabilitation techniques such as strengthening the extrinsic and intrinsic muscles of the foot as there is no way to separate the contraction of the FDL and FHL when this sort of fusion exists.

G.14 Clinical Implications of a Fibularis Quartus Muscle: A Physical Therapy Perspective

Timothy Binsfelt, Michael Brunner, and Adam Cordova
Advisor: Thomas Greiner, Ph.D., M.A.H.C.P., Physical Therapy

The fibularis (peroneus) quartus (FQ) is a muscle that is located in the lateral compartment of the leg, most often originating posterior to the bifurcation of the fibularis longus and fibularis brevis muscle bellies. This muscle has a presumed function of eversion of the ankle joint due to its attachments. Previous reports of the FQ frequency have been found to range from 6 to 27% with several variations of the muscle being reported. These variations have included distal attachments onto the cuboid, fibularis longus tendon, peroneal tubercle, or retrotrochlear eminence of the calcaneus. The purpose of this study was to examine the frequency and possible variations of FQ muscle in cadaveric subjects while proposing clinical implications of its presence. Number of Subjects. 24 Methods. There were 48 lower limbs dissected from cadavers from the University of Wisconsin-La Crosse Health Science Center. Cadavers were previously dissected by students in graduate programs, causing four limbs to be deemed unacceptable for use. This resulted in 44 limbs for data collection. Results. 12/44 limbs contained an FQ muscle. Of the twelve FQ muscles found, six were located bilaterally on three cadavers, where the other six FQ muscles were observed unilaterally on six different specimens. Clinical Relevance. In patients who present with chronic lateral ankle pain, swelling, and instability that does not improve with conservative care, the presence of a FQ muscle should be considered and the potential need to refer for further imaging of the injured leg. Proposed implications of the presence of this muscle are swelling in the lateral compartment of the ankle leading to pain and dysfunction of the fibularis longus and fibularis brevis muscles. The presence of this variant muscle, if injured, could potentially lead to misinterpretation of ankle tests designed to stress ligamentous structures in the lateral ankle.

G.15 Walk Strong, Walk Tall: A Fall Prevention Program

Hannah Cyphers, Carli Hron
Advisor: John Greany, Ph.D., Physical Therapy

Introduction: Falls and the associated risks pose a major threat for the elderly. The purpose of this study was to determine if Walk Strong, Walk Tall program had an effect on select risk factors for falling; increased confidence in avoiding falls and/or improved temporal-spatial measures of gait. Methods: Five participants (78.3 ± 3.8 years; 4 females; 1 male) were enrolled in the Walk Strong, Walk Tall program. The program consisted of educational sessions reviewing risk factors for falling and how to minimize their risk as well as balance exercises. The program consisted of one session per week for five weeks. Thirteen outcome measures were utilized: a modified Activities Balance Confidence Scale, gait velocity, cadence, stride length (left and right), stance percentage (left and right), and double support time (left and right) measured by an instrumented gait mat (GaitRite) operating systems. Paired t-tests were used to compare pre/post change and data were analyzed with SPSS software. Results: 60% of participants expressed they felt more confident in not falling at the conclusion of the program. The mean change score for the modified Activities Balance Confidence scale did not show significant improvements; however question 2 (confidence in walking stairs) showed a trend towards improvement (70 + 15.8 to 80 + 10.0; p=0.08). There were no changes seen in temporal-spatial gait variables with this 5 week fall prevention program (p>0.05). Conclusions: Previous studies have shown improvements in measurements of fall risk with this fall prevention program in the past. It is possible that five sessions were not enough time to document improvements with the outcome measures used for this study. It is recommended that other assessment instruments be used and replicated with a larger sample size and slightly longer duration.

G.16 Cardiorespiratory Energy Requirements during a Firefighter Agility Test

Benjamin Ceder and Daniel Fecht
Advisor: John Greany, Ph.D., Physical Therapy

Introduction: Firefighter's are at an increased risk sudden cardiac death, due to their hazardous and strenuous occupation requirements. The purpose of this study was to determine the cardiorespiratory requirements of firefighter's performing simulated job-related tasks. Methods: 12 male firefighters from Onalaska, WI (37.5 ± 11.5 years, BMI 26.8 ± 8.4) volunteered to participate in this study. The study consisted of two sessions; a treadmill test to determine maximal cardiorespiratory fitness (Peak VO2 and maximal heart rate) and a standardized firefighter agility test. The agility test consisted of the following tasks: hose drag, ladder check, dummy drag, chainsaw carry, pole pike, stair climb with weight, sledgehammer, and hose pull. A portable metabolic analyzer (Oxicon Mobile) and Polar HR monitor were used to collect expired gases and HR data continuously. Data from Session two was compared to maximal data from Session one to determine the cardiorespiratory energy requirements. Results: The mean maximal HR was 179.5 + 11.1 bpm and VO2 peak was 42.6 + 5.4 ml.kg-1.min-1. The simulated firefighting task resulted in near maximal heart rate values (>90% for all tasks except one). The mean percent of VO2 peak for all simulated tasks was 78.2 % (range 48.4 – 88.1%). All but one of the simulated tasks were greater than 75% of VO2 peak. Conclusions: This study demonstrates that firefighters reach near maximal cardiovascular limits while performing job-related tasks. Seven of the 8 tasks resulted in HR values greater than 90% of HRmax. Firefighters would benefit from a cardiovascular training program throughout their careers to reduce the following cardiovascular risk factors (obesity, inactivity, hypertension, and stress).

G.17 Consultation Skills of School Psychologists: Impacting Teacher RtI Practices

Megan Galdes, Jocelyn H. Newton, Ph.D.
Advisor: Jocelyn H. Newton, Ph.D., Psychology

As the RtI model of service delivery becomes widely used, it is critical that School Psychologists adapt to meet the changing demands of their role. This study examined the predictive relationship between school psychologists' consultation skills and teacher RtI beliefs. This study aimed to increase knowledge about teacher buy-in for the RtI process by highlighting effective consultation strategies. Results will help school psychologists gain knowledge about how to best provide support within an RtI framework.

G.18 The Reading Gender Gap: Influences of Parent Gender-Role Stereotypes

Katie Goulet

Early literacy skill development is critical to later academic outcomes. One factor that may impact early literacy development is the endorsement of parent gender-role stereotypes. This study will examine whether children's early

literacy skills differ significantly as a function of their gender and/or parent's gender-role stereotypes. Study results will provide implications for professionals working with parents and their children.

G.19 Reliability of a Simple Online Left-Right Hand Recognition Test

Raeann J. Bennet, Cara A. Hamer, Phillip L. Hanson, Joel R. Narveson, William L. Schultze, Alec T. Schumacher
Advisor: Patrick Grabowski, PT, PhD, Physical Therapy

Study Design: Cross sectional study, test-retest design Objectives: Examine test-retest reliability of a left-right hand image recognition test to determine the potential for clinical use as an outcome measure. Background: Previously, pain was explained by Melzack's gate theory of pain, which failed to adequately explain chronic pain. Emerging research promotes the neuromatrix theory, which postulates that chronic pain is an output of inappropriate central nervous system (CNS) processing. Persistent pain leads to disorganization of the perceptual motor systems. Treatment, therefore, is targeted at improving CNS processing. Previous research shows that efficiency of CNS processing can be assessed by a hand recognition test (Recognise, NOI group). No cost effective clinical outcome measure exists to reflect reorganization. If Recognise demonstrates clinical reliability it could fill this void. Methods/Results: Eighty-five healthy participants were recruited in two age groups ((n=61), 23.23 ± 1.4 years; (n=24), 53.28 ± 17.01). All participants completed two sessions of a Recognise test protocol, with 2-8 hours separating sessions. A 4-factor (session, trial, hand, age group) repeated measures ANOVA was used to evaluate systematic differences between test sessions. Recognise showed high reliability (ICC = 0.90, SEM = 0.11 s; MDC = 0.30 s) for reaction time in both sessions with means of 2.1 ± 0.56 s and 2.0 ± 0.54 s, respectively. Accuracy also showed high reliability (ICC = 0.80, SEM = 3.13%, MDC = 8.7%) across both sessions ($\bar{x}1 = 83 \pm 12\%$; $\bar{x}2 = 87 \pm 10\%$). Conclusion: The Recognise test displays clinically acceptable reliability, low standard error of measure, and low minimal detectable change in a healthy population. Use of this test may be warranted in measuring central processing changes in patients with chronic pain. Further research is needed in this area of practice.

G.20 Homework Completion: Student Perspectives in a Standards-Based Era

Brittany Harn
Advisor: Robert Dixon, Ph.D., NCSP, Psychology

The debate among educators and parents on homework lies within the intended role and purpose to a student's academic learning and/or the development of responsibility, autonomy and time management. It is important to gain the students' voice on the reasons they complete homework. This study examines middle school student's perspectives on homework and will determine which factors contribute to homework completion in order to provide implications for educators on how to accomplish this important goal.

G.21 Burnout: Predicting Job Satisfaction among School Psychologists

Sarah Jacobson
Advisor: Betty DeBoer, Ph.D., Psychology

Expectations of school psychologists are expanding quickly. New demands can lead to burnout and may negatively impact professional performance by increasing absenteeism and decreasing work quality, motivation, and the quality of services school psychologists provide. This study builds on previous research that examines mental health providers and extends it to predictors of job satisfaction for school psychologists. Results will be used to make recommendations on how school psychologists can avoid burnout and increase job satisfaction.

G.22 Single Leg Dynamic Postural Control in Runners with and without History of Injury

Anika Johnson, Anna Klusendorf, Thomas Kernozek, Stacey Meardon
Advisor: Thomas Kernozek, Ph.D., FACSM, Physical Therapy

It has been speculated that individuals who have a history of injury leading to functional ankle instability may jump and land on a single leg differently than those who are uninjured. One measure used in recent literature to assess individuals' ability to maintain balance while moving from a dynamic to static state is the Dynamic Postural Stability Index (DPSI). The DPSI measures dynamic stability in four directions of motion (anterior/posterior, medial/lateral, vertical, and combined). The purpose of this study was to compare differences in DPSI measures in runners without and with a history of running related injury. Forty-four runners were recruited, twenty-two subjects with history of lower-extremity injury. Dynamic balance was assessed using anterior/posterior hops and medial/lateral hops over a 12-inch and 6 inch hurdle, respectively. The single leg DPSI was calculated for each subject for each hop condition. Data were analyzed with SPSS software using 2x2 repeated-measures ANOVA. The between-group factor was injured versus uninjured runners and the within-group factor was hop condition (AP versus ML hop). The four DPSI directions were used as dependent variables and mean DPSI values for uninjured and injured runners were calculated and compared between groups (alpha= 0.05). Combined vertical DPSI measures were significantly different between injured and uninjured runners. Significant differences were also found in all DPSI directions between hop conditions. There may be differences in dynamic postural control between injured versus uninjured runners as previously speculated, as it was found that injured and uninjured runners attenuated vertical forces when landing after a hop differently. Further research on different types of running injuries and how they affect dynamic postural control in injured versus uninjured runners will help us better understand factors contributing to running-related injury and help us better develop and guide physical therapy rehabilitation interventions for runners in the future.

G.23 Differences in Estimated Knee Ligament Forces in Landing from a Barrier Jump between Anterior Cruciate Reconstruction (ACL-R) Participants and Healthy Controls

Sarah Bootma, Becky Heinert, Dian Hong, Sarah Leissring, Stephanie Lopez, Robert Ragan
Advisor: Thomas Kernozek, Ph.D., FACSM, Physical Therapy

Anterior cruciate ligament (ACL) injuries affect up to 250,000 athletes in the US annually. ACL reconstruction (ACL-R) and physical therapy is the standard of care to return to sport. Outcomes appear quite variable and nearly 25% have been reported to sustain a second knee injury. It is largely unknown how these movement patterns relate to ligament forces during dynamic activities. Our purpose was to examine differences in knee ligament forces in landing between ACL-R participants and healthy controls. Seventeen female ACL-R participants and fifteen controls were tested while jumping with a single leg over a 29 cm barrier. After a warm-up, three trials were collected. Kinematic data were captured with a 13 camera motion analysis system at 180 Hz and synchronized with kinetic data from two force platforms collected at 1800 Hz. These data were processed where 47 markers and subject specific parameters were used to generate a human body model with 18 segments and 300 muscles. External forces and movement kinematics were combined with joint centers and segment masses to determine joint moments, and static optimization was used to estimate muscle forces. These data were used in a two dimensional model of the knee to estimate knee ligament shear loads during landing. Multivariate statistics were used to compare dependent variables between groups (alpha = 0.05). Ligament shear loads were different between groups ($p < 0.05$) and were approximately 35% higher for the ACL-R participants. This difference was largely attributed to the nearly 40% reduction in hamstring shear force and 32% less knee flexion at contact. The patellar tendon shear force was approximately 29% higher and the tibiofemoral shear force was 3% greater for controls. ACL-R participants appear to demonstrate landing mechanics that would place greater estimated force on the ACL than healthy controls.

G.24 Zephyr BioharnessTM measurement accuracy of breathing rate at ventilatory threshold during graded exercise testing

Benjamin Krings
Advisor: Glenn Wright, Ph.D., Exercise and Sport Science

The Zephyr Bioharness (BH) is a physiological monitoring device that collects data without obstructing movement. The device measures breathing rate (BR), heart rate (HR), and can predict maximal oxygen consumption (VO2max). This data can be collected without the use of equipment that would be seen in an exercise physiology lab such as a metabolic cart that measures respiratory gas exchange. The purpose of this study was to compare VO2max values derived from a metabolic cart and from an ACSM regression equation and BR at VT from both a metabolic cart and BH during an incremental treadmill test. Sixteen, college aged, recreationally active men volunteered for this investigation. During the day of testing, subjects completed an incremental exercise test until exhaustion in the exercise physiology laboratory. Subjects wore the BH and a snorkel like breathing apparatus to measure respiratory gas exchange. There were no

significant differences ($p = .352$) in BR at VT between the respiratory gas exchange method (31.00 ± 5.11) and BH (29.31 ± 5.00). Heart rate values at VT were 169.91 ± 19.69 beats per minute. Maximal oxygen consumption values from the metabolic cart (61.62 ± 5.56 ml/kg/min) and ACSM regression equation (57.60 ± 4.10) were significantly different ($p < 0.01$). These two values had a correlation value of $r = .756$. The results from this study suggest that the BH can be used as an accurate device to conduct a maximal oxygen consumption test to determine VT outside of an exercise physiology lab. From a practical standpoint this device allows strength and conditioning coaches and sport coaches to test large numbers of athletes in a quick and efficient manner compared to completing testing in an exercise physiology lab.

GRADUATE ORAL PRESENTATION ABSTRACTS

GRAD.1 Proof of Concept for Simultaneous and Rapid Detection of Enterohemorrahagic Escherichia Coli (EHEC) Serogroups by Real-Time Reverse Transcriptase PCR

Josephine Greve
Advisor: S.N. Rajagopal, Ph.D., Microbiology

Enterohemorrhagic Escherichia coli (EHEC), including E. coli O157:H7, cause human illness worldwide through the consumption of contaminated food and water. EHEC produce Shiga-toxin, encoded by stx genes, and attachment and effacing lesions on human intestinal lining, encoded by eae gene. The purpose of this study was to prove the concept that RNA from pathogenic EHEC can be stabilized and extracted, the eae gene detected rapidly, and with minimal bacterial enrichment. Studies have been done to detect the eae gene in E coli O157:H7 by reverse transcribing RNA and performing real-time PCR; however, no studies have detected multiple strains of EHEC by extracting RNA. E. coli serogroups (O26, O45, O103, O111, O121, O145, and O157) were grown to mid-log phase and RNA was extracted with KingFisher Duo, quantified, and reverse transcribed. The pathogenic eae gene was detected by using two qPCR methods, SYBR Green I and Hybprobe. In addition, crossing point (CP) values from housekeeping gene gstA were detected by SYBR Green I qPCR, and compared against eae CP values. Method sensitivity and specificity was also tested using the described procedure. The RNA extraction method was effective at yielding pure and intact RNA based on NanoDrop measurements and agarose gel visualizations. The qPCR procedures differed in that the Hybprobe method generated much lower crossing point (CP) values and distinct melting peaks for EHEC serogroups compared to SYBR Green I. Based on lower CP values and melting peak results, Hybprobe qPCR is a better final detection step to be used with the RNA extraction method. Moreover, the Hybprobe method is more sensitive and specific compared to SYBR Green I qPCR. These results show the described method confirms the proof in concept that RNA can be extracted from culture samples, and the eae gene can be detected in multiple EHEC serogroups simultaneously.

GRAD.2 TOZE 2.0: Re-engineering GUI Editor and Type Checker for Object-Z Specification Language

David Stoleson
Advisor: Kasilingam Periyasamy, Ph.D., Computer Science

Tool support is essential for teaching and using any formal specification language. At the very minimum, an editor and a type checker are required for developing specifications. The University of Wisconsin-La Crosse (UW-L) developed a GUI editor and a type checker called TOZE for teaching and using Object-Z specification language. While most errors reported from the users of TOZE have been fixed over the years, there were considerable issues in GUI which could not be easily fixed. So the developers decided to re-engineer TOZE with a different GUI but at the same time maintaining its type checker component intact. This paper describes the re- engineering of TOZE detailing the challenges encountered, new features added and continuing work in this direction.

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Jacob St. Mary	Exercise and Sport Science	Carl Foster	The Effects of Glycogen Depletion on Pacing in 5km Cycling Time Trials
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Margaret Weitzman	Biology	Thomas Volk	A Role for Fungi in Saving the Planet: Removal of Arsenic from Polluted Ecosystems by Mycoremediation
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Roksana Zak	Exercise and Sport Science	Naoko Aminaka	Kinesiology Tape (KT) and Injury Recovery/Function during Delayed Onset of Muscle Soreness (DOMS)
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