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Friday, April 3, 2015
Valhalla, Cartwright Center
8:30am – 12:55pm

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SCHEDULE OF ORAL PRESENTATIONS

	Room #326	Room #330	Room #331	Room #332
8:30 to 8:50	<p>GR.1 Sara Erickson <i>Recreation Management</i></p> <p>Tournament Angling in Wisconsin: The Economic Impact of Bass, Salmon, and Walleye Fishing Tournaments on Host Communities</p>	<p>UR.1 Eric Barreau <i>Psychology</i></p> <p>Chew on this: Self-control, eating, and mindfulness</p>	<p>GR.2 Jason Magnuson <i>Biology</i></p> <p>Relation among methylmercury, selenium, and biomarkers of oxidative stress in livers of northern pike</p>	<p>UR.2 Cassandra Philippon <i>Psychology</i></p> <p>Presence of 'Love Languages' in Intimate Relationships Across Generations</p>
8:55 to 9:15	<p>GR.3 Xingxing Lin <i>Biology</i></p> <p>Mechanism of Microtubule Rod Formation in 13-lined Ground Squirrel Platelets</p>	<p>UR.3 Thatcher Rogers <i>Archaeology</i></p> <p>A Comparative Analysis of Small Scale Medio and Post-Paquime Lithic Assemblages in Casas Grandes, Chihuahua, Mexico</p>	<p>UR.4 Hannah Olevson <i>Marketing</i></p> <p>Fitting In: An Examination of American Study Abroad Students' Nonverbal Expectancy Violations During Their Time Abroad</p>	<p>UR.5 Mackenzie Miller <i>Archaeology</i></p> <p>A Re-Evaluation of Oneota Cultural Phases in the La Crosse Locality</p>
9:20 to 9:40	<p>UR.6 Erin Maletzke <i>Spanish</i></p> <p>From Brothels to the Classroom: the Sex Appeal of the Tango in "Take the Lead"</p>	<p>UR.7 Jessica Gonzalez <i>Therapeutic Recreation and Spanish</i></p> <p>"Bandoneon:" Creating Parallels between Music and Life.</p>	<p>UR.8 Henry Meger <i>Youth Options</i></p> <p>The Sociolinguistic Reflection of the Evolution of Tango's Public Image</p>	<p>GR.4 Wayne Means <i>Therapeutic Recreation</i></p> <p>Therapeutic Recreation at Camp: A Delphi Study Identifying Important Elements of Therapeutic Recreation When Applied During a Residential Summer Camp</p>

	Room #326	Room #330	Room #331	Room #332
9:45 to 10:05	<p>UR.9 Rebecca Schnabel <i>History, Philosophy</i></p> <p>An International World, lacking an International Language</p>	<p>UR.10 Stephanie Holt <i>Public Administration</i></p> <p>The Comparative Study of the Academic Effectiveness of Milwaukee College Preparatory Schools (MCPS) and Milwaukee Public Schools (MPS)</p>	<p>UR. 11 April Wildes <i>English Literature</i></p> <p>Who Are You In Wonderland?</p>	<p>UR.12 Lisa Stoughton <i>Sociology</i></p> <p>Physical Decline, Age Identity and Social Interaction In the Elderly Population</p>
10:10 to 10:30	<p>UR.13 Ariel Reker <i>Archaeology</i></p> <p>[art]ifact: The Planning Stage of an Innovative Exhibit</p>	<p>UR.14 Noelle Griffiths <i>Organizational and Professional Communication</i></p> <p>Communicating Study Abroad Encounters</p>	<p>UR.16 Jennifer DeRocher and Corinne Rabay <i>History</i></p> <p>The Relationship of the Campus, the Community, and Environmental Movements in La Crosse</p>	
10:35 to 10:55	<p>GR.5 Heather Hutchings <i>Microbiology</i></p> <p>A novel virus discovered in white sucker fish: characterization and assessment of risk to Wisconsin white sucker populations.</p>	<p>UR.17 Allecia Kruser <i>Art Education</i></p> <p>Art and Yoga in Perspective: Applications of Historical Techniques in Contemporary Practices</p>		

	Room #326	Room #330	Room #331	Room #332
11:00 to 11:20	<p>UR.18 Danielle Watterson <i>Philosophy</i></p> <p>Language as Cognition: Truth as Subjective</p>	<p>GR.6 Whitney Swanson <i>Biology</i></p> <p>Effects of flooding, invasion and nitrogen addition on nitrogen cycling in the upper Mississippi river floodplain</p>	<p>UR.19 Dakota Elliott <i>History</i></p> <p>Culture Clash and Racism: How the 1980s Spearfishing Conflict Impacted Lakeland Union High School</p>	<p>UR.20 Thatcher Rogers <i>Archaeology</i></p> <p>Architecture as Craft Specialization: An Examination of Changes in Style at the Archaeological Site of Paquimé, Chihuahua, Mexico</p>
11:25 to 11:45	<p>UR.21 Danielle Watterson <i>Philosophy</i></p> <p>Being, Love, and Our Raison d'Etre: Exploring Sartre and Modern Sexuality</p>	<p>UR.22 Julia Roden <i>History</i></p> <p>The History Hunt</p>	<p>UR.23 Mai Zoua Vang <i>Organizational and Professional Communication</i></p> <p>Identity Development in Northern Thailand: Hmong Thai Experiences as a Marginalized Group</p>	
11:50 to 12:10	<p>UR.24 Danielle Watterson <i>Philosophy</i></p> <p>The Beauty of Possibility: Logic and Time Travel</p>	<p>UR.25 Natalie Kellerman <i>Sociology</i></p> <p>At Risk as Disrespect: The Experience of Black Male Youth in Wisconsin</p>	<p>UR.26 Lily Cornwell <i>Theatre: Music Theatre Emphasis</i></p> <p>Road to Hell</p>	

UNDERGRADUATE STUDENT ABSTRACTS

UNDERGRADUATE POSTER PRESENTATION ABSTRACTS

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

U.1 Patterns of Power Output Use in Sprint Cycling

Samantha Suckow
Advisor: Carl Foster, Exercise and Sports Science

Pacing strategies have been a wide focus study over the last 20 years. Athletes choose their pacing strategy from the start of the exercise, and continue pacing to the end of the exercise in a way that optimizes the use of their energy resources and are designed to complete an event in the fastest time possible. The main purpose of this study was to analyze whether or not cyclists reached their peak power output during sprint races or if they backed off from peak power output and consequently created a pacing strategy even in very short duration events. Subjects completed a maximal incremental test (VO₂Max) and three time trial protocols (250-m, 500-m, and 1000-m). The results of this study suggests subjects are not using full peak power output during time trials and are backing off and creating pacing strategies.

U.2 Effects of Triclosan (TCS) of Cardiovascular Health in Zebrafish

Alisha Saley and Megan Hess
Advisor: Tisha King-Heiden, Biology

Pharmaceuticals and personal care products are “emerging contaminants of concern” that are being scrutinized for their potential as developmental contaminants to aquatic organisms. Triclosan is a chemical found in many pharmaceuticals (i.e. hand soaps, deodorant, toothpaste) that are used daily and eventually make their way into our groundwater systems and aquatic environments. Recent work done in our lab shows that developmental exposure to triclosan causes accumulation of water and swelling around the heart (pericardial edema). Therefore, we are interested in determining whether developmental exposure to triclosan affects the structure of the heart and/or reduces cardiovascular health. We are currently exposing zebrafish embryos to various concentrations of triclosan during early development, and testing the hypothesis that TCS affects the structure and function of the heart. Our goal is to better understand the potential risks that personal care products, such as triclosan, pose to wild fish.

U.3 Are There Differences in Arm Angles of Collegiate Baseball Pitchers as They Throw Different Pitches? A 2-D Analysis

Michael Galezio
Advisor: Naoko Aminaka, Exercise and Sports Science

The risk factors for overuse injuries in baseball pitchers include pitch counts, velocity, and types. There has not been a study that investigated arm angles among different pitch types in collegiate pitchers. Objective: Identify any differences between pitch types in shoulder external rotation (ER) at the end of the cocking phase or the arm carrying (AC) angle at the moment of release. Participants: A total of ten college pitchers participated in the study. Interventions: Each pitcher threw 5-10 trials of each of the four different pitch types: fastball (FB), curveball (CB), change-up (CU), and 2-seam fastball (2F). Each pitch was recorded from the sagittal and frontal views using high-speed digital camera. Dartfish Connect motion analysis software was used to measure maximum shoulder ER angle (forearm relative to the shoulder joint center) at the end of the cocking phase in the sagittal view, and the AC angle (combination of shoulder adduction, horizontal adduction and internal rotation, taken by obtaining the angle between the humerus and torso) at the ball release in the frontal view. Analysis: The average ER angle in the sagittal view, and the average AC angle in the frontal view, using the four different pitch types, were used for the statistical analysis. For each angle, a within-subject ANOVA was used for detecting differences in the arm angle among the four pitch types. The level of significance was set at $p < .05$. Results: The shoulder ER angles showed statistically significant differences amongst pitch types. However, a post-hoc pairwise comparison did not yield significant differences between particular pitch types. There was no statistically significant difference among the pitch

types on the arm carrying angle. Conclusion: The lack of statistically significant data shows that a pitcher's ER or arm carrying angle does not change based on the type of pitch he throws.

U.4 Road Network Analysis of Oslo, Norway

Jonas Rugtvedt
Co-Author: Gargi Chaudhuri
Advisor: Gargi Chaudhuri, Geography and Earth Science

Oslo is a city that has seen great urban development during recent decades. Transportation networks are one of the important components of a city, which play an essential role in the socio-economic development of a city. The present study looks at the multi-temporal development of road network of the Oslo and explores its relationship to the socio-economic changes within the city. Graph-theory based indices are used to calculate the level of connectedness of the road network and spatial correlation is used to understand its relationship with the socio-economic variables of the city. The study will give insight about road connectivity of Oslo, its development over time, and look for correlation between socioeconomic factors and connectivity.

U.5 Stuck in a Daydream: Physiological Responses in Individuals with Imaginative Personalities

Olivia Cody and Stacey Rolak
Advisor: Alessandro Quartiroli, Psychology

Mental imagery has been used to enhance performance on tasks and to increase relaxation in high stress situations. Mental imagery is a cognitive process that involves internally perceiving a stimulus in the absence of external stimuli. Previous research has indicated that there are individual differences in how well people are able to employ mental imagery. The proposed study will investigate the relationship between the personality trait of fantasy proneness, mental imagery, and physiological responses to visualization. Fantasy prone individuals often fantasize and daydream, and they report experiences of vivid imagery, hallucinations, and out-of-body experiences. Participants will complete a questionnaire measuring fantasy proneness and be split into either a "high" or "low" fantasy group. Individuals in each group will then receive either a relaxation or stress-producing imagery intervention, where their physiological responses will be measured by looking at heart rate variability and skin conductance. We expect our results to show that fantasy prone individuals will elicit a stronger physiological response to both relaxing and stressful mental imagery, and will also report higher imagery ability than less fantasy prone individuals. Research in these areas would be important for enhancing the understanding of factors that affect the ability to use mental imagery. The results may be helpful for tailoring visualization interventions.

U.6 Effects of Shear Rate, Temperature, and Blood Composition on Platelet Adhesion and Aggregation in Whole Blood of Thirteen-lined Ground Squirrels

Sarah Lloyd and Kathryn Dobbs
Co-Authors: Thomas Theisen and Colton Taylor
Advisor: Scott Cooper, Biology

Significant alterations in shear rate, temperature, and blood composition have been recorded in hibernating animals. These factors directly impact platelet clot formation, but it is currently unknown which factor has the greatest influence. To discover how each factor directly affects coagulation, capillary blood flow was replicated by use of a channeled microfluidic device. Flow rate was controlled with a syringe pump while temperature was controlled using stage heating and cooling techniques. Non-hibernating conditions were simulated using high flow rate at 35°C, and hibernating conditions were simulated using low flow rate at 15°C. Whole blood was run from both hibernating and non-hibernating thirteen-lined ground squirrels under both conditions. To allow for observation of blood flow and clot formation, microfluidic devices were placed on slides lined with a strip of collagen. As platelets flowed through the channels within the device, they adhered to the collagen strip. Slides were then fixed for further study of these clots. Flow of blood through the chambers was observed using an inverted phase contrast microscope and recorded on video. Clot formation over time was evaluated by use of these recordings. Platelets were also labeled with a fluorescent dye for analysis of the clots adhering to the collagen strip after flow. Clots were assessed using confocal fluorescent microscopy to determine differences in morphology and total surface area under the different conditions. Preliminary results suggested that hibernating conditions (low shear rate and temperature) have

a more prominent effect on the resistance of platelets to adhesion and aggregation than blood composition does. Further studies will investigate the effects of similar conditions on the blood of non-hibernating mammals to determine whether or not the observed response to cold temperature with low shear rate is a unique quality of hibernator blood.

U.7 The Effect of Compression Socks on Running Performance and Blood Lactate Level

Paul Burant and Michael Borst
Co-Author: Naoko Aminaka
Advisor: Naoko Aminaka, Exercise and Sports Science

Compression socks are becoming more popular among distance runners due to the claimed effect of increasing performance and decreasing blood lactate level. However, it's unclear whether these claims actually occur during running. Objective: Investigate the effects of compression socks on running performance and blood lactate level in a run-to-fatigue test. Design: Crossover study. Patients: Twelve college-age participants (age=21.73±1.74 years old, height=1.70±0.079m, mass=66.89±12.03) who haven't had a lower body injury in the last six months and have not worn compression socks in the past. Intervention: Participants performed two run-to-failure tests on a treadmill. One test was performed wearing compression socks and the other was performed wearing standard crew socks. The order of the sock condition was randomized, and the tests were scheduled a minimum of 7 days apart. Each test began at 6 miles per hour and a zero percent incline, and was raised by 1mph and 1% incline every 2 minutes until failure. 30 seconds prior to the increase, perceived exertion was recorded. Total time was recorded to assess performance. Blood lactate was measured using a finger prick before and after the test. A blood lactate analyzer was used to assess the difference in pre- and post-run blood lactate levels. The independent variable was the sock condition. Dependent variables were the change in the blood lactate level and performance time. Results: There was no significant difference on the blood lactate level between sock conditions ($t=-0.421$, $P=0.682$, Compression=9.86±0.60mmol/L, Control=10.23±3.56mmol/L). No significant difference was found on performance time between sock conditions ($t=-1.02$, $P=0.331$, Compression=429.92±175.46sec, Control=444.33±165.46sec). Conclusion: There were no significant differences between sock types in blood lactate level or run-to-fatigue performance. Some participants reported they could run farther with the compression socks, whereas others felt the compression socks did not help. Increased performance may be due to a psychological factor.

U.8 Refining Our Understanding of the Toxicity of the Sediments from Myrick Marsh

Alex Olson
Advisor: Tisha King-Heiden, Biology

The La Crosse River Marsh (Myrick Marsh) is known for numerous recreational activities for residents and tourists including the biking, running, and walking trails throughout the area. However, from 1932-1963, Myrick Marsh was a prime location for trapshooting competitions that resulted in contamination of the sediments due to Pb ammunition. We have found that Pb is bioavailable to fish living in the marsh, and that the sediments are indeed toxic. However, the toxicity of the sediments are not dose-dependent, and it remains unclear whether toxicity is due to Pb. Therefore, I am looking at gene expression of δ -aminolevulinic acid dehydratase (ALA-D) in zebrafish embryos exposed to Myrick Marsh sediments as a biomarker for Pb toxicity. This will help us further understand the effects of the Pb-contaminated sediments and contribute to the decisions made to ensure the protection of the marsh and its inhabitants.

U.9 The Uncertainty of Sino-Tibetan and Altaic Languages in John Stuart Mill's *Of Names*

Jordan Batchelor
Advisor: Mary Krizan, Philosophy

John Stuart Mill's 1843 publication *Of Names* excluded certain eastern languages—for example, Chinese, Japanese, Korean, and Mongolian, of the Sino-Tibetan and Altaic families, respectively. In doing so, Mill's notions of surnames and given names diminish his credibility. I will quote Mill to show directly these notions, and then I will show specific examples of Chinese, Japanese, Korean, and Mongolian given and surnames and how these names transcend Mill's proposed categorical naming system. This system requires that given names or surnames cannot both denote a singular person and connote a person's qualities or attributes.

This is important because of what it could mean for Mill's other works, and, possibly, for other philosophy of language. Could western philosophers have gotten it wrong? In other words, philosophy of language generally applies to the theory of all language, so if much or even just part of the languages in discussion thus far has been incomplete, then there is a fundamental problem with the discipline itself. Does that mean abolishing all previous or incomplete works? Should language philosophers more deeply consider the vast variety of languages in operation, or should the discipline separate between language families? These questions get at the very heart of language philosophy, and though they may never be truly answered, I would argue that a more universal philosophy of language theory should be put forth, emphasized, and utilized if the field is to reach the most important depths.

U.10 The Impact of Manipulating Sestamibi Doses on Extremity Radiation Exposure

Lindsey Brandt

Co-Authors: Abbie Grancorvitz, Carlyn Johnson

Advisor: Aileen Staffaroni, Nuclear Medicine

Cardinal Health, the radiopharmacy serving Saint Joseph's Hospital, recently changed their unlimited free deliveries to three per day. Due to this change, more contingency stress doses (30mCi) of 99mTc-Sestamibi for myocardial perfusion imaging (MPI) are being ordered to accommodate add-on MPI exams. These doses are adjusted to the correct dose by removing activity from the unit dose, either by drawing activity out of the syringe or by changing a needle. Saline may be added if the volume of the dose is very small. The purpose of this study is to determine if there is a significant increase in ring badge exposure rates due to adjusting sestamibi doses as compared to measuring the appropriately calibrated doses. Two months of exposure readings were obtained. Two ring badges were used for each month: one ring was worn when sestamibi doses needed to be altered and the other ring was worn to measure correctly calibrated unit doses. The average time to manipulate and/or measure a sestamibi dose and the number of doses measured for each ring were recorded. Ring badge readings were then evaluated. Each manipulated dose resulted in an average exposure rate of 4.5 mrem whereas the average exposure rate of the appropriately calibrated unit dose was 0.08 mrem. On average, the technologist spent an additional 30 to 60 seconds handling the modified dose. Our current research shows that manipulation of a sestamibi dose increases the radiation exposure to a technologist's ring badge. These exposure rates may vary depending on a technologist's experience, technique, and time spent manipulating the dose. Further collection of exposure rates on both dose sets is ongoing in order to solidify our research.

U.11 Providing a Blueprint for Complete Streets Reform through Network Analysis of Supporters

Alex Parsons

Advisor: James Longhurst, History

People in the United States travel by car, bicycle, and foot on a weekly basis and often use more than one mode of transportation to get from place to place. A recent reform movement in urban planning known as Complete Streets emphasizes the need for city planners, engineers, and developers to take into account all users on the streets. The health benefits, economic impact, and sustainability associated with Complete Streets design make the concept appealing for communities around the country, with more than 700 creating policies or ordinances in the last decade. To assist communities in developing Complete Streets programs or policies, it is important to understand the individuals involved in successful advocacy. The aim of this research is to identify individuals crucial to Complete Streets reform by examining the case study of La Crosse, Wisconsin. Who contributed to the creation and passage of the City of La Crosse Green Complete Streets Ordinance in 2011? The research methodology begins with interviews with individuals from community health organizations, public planning departments, bicycle advocacy groups, as well as city and county board members. The interview subjects were asked to identify key players in the support and passage of the 2011 ordinance, with the results subjected to network analysis in open-source Gephi visualization software to reveal the relative importance of individuals, agencies, and connections. Further analysis will place events in La Crosse in context with similar advocacy in Minnesota. Future implications for this research include helping communities initiate policy and legislation for a multimodal approach to street and community development, connecting advocacy groups to professionals and resources, and creating a network of support for individuals utilizing alternative transportation options in their communities. Preliminary Analysis -- La Crosse Individuals Figure 1: Preliminary network analysis of individuals involved in the passage of the 2011 La Crosse, WI Green Complete Streets Ordinance reveals that one individual is more

clearly identified as a key supporter, with a smaller number of secondary players and a broader number of tertiary supporters. Subsequent analysis will examine linkages, communities, and organizations. Keywords: Complete Streets, multimodal transportation, alternative transportation, health, sustainability, network analysis

U.12 Investigating the Dependence of Transmission Rate to Water Temperature in a Host-Parasite System

Mary O'Driscoll
Co-Author: James Pierce
Advisor: James Pierce, Mathematics

Every year, thousands of waterfowl around the upper Mississippi River are dying from parasites transmitted to them through an invasive species of snail. The parasite species exhibit temperature-dependent transmission patterns with no transmission occurring when temperatures either fall below or exceed certain thresholds. The transmission window overlaps the waterfowl's seasonal migrations. The purpose of this study was to determine how the temperature of the water affects the transmission rate of the parasite. First, we moved the range and the location of the temperature window for parasite transmission. Second, we created an algorithm that defined the transmission parameters based upon the length of time temperature spends above or below a known threshold. In both studies, the size of the infected host populations depended on the temperature window and accrued time. Results reinforce biological observations and emphasize why it is important to study transmission at various temperatures in the laboratory.

U.13 Qualities of Adhesion of *Bacillus subtilis* to Caco-2 Cells

Sawan Talwar
Co-Authors: Hayley Powers and William Vargas
Advisor: Margaret Maher, Biology

Probiotics are bacteria that have been used to ferment foods throughout history and are consumed along with the foods they ferment. *Bacillus subtilis* are rod-shaped, Gram-positive, aerobes that have recently been explored, commercially and medically, as probiotics that will improve digestive system function. The goal of this research is to determine the degree to which and ways that *B. subtilis* adhere to Caco-2 cells, a colon cancer cell line that mimics the intestinal mucosal membrane when the cells form a confluent monolayer. The cells are maintained in a standard medium (EMEM), dispersed with trypsin-EDTA, and seeded on coverslips in 24-well plates. *B. subtilis* spores are centrifuged and resuspended using the EMEM. The spores are placed on the monolayer of Caco-2 cells. Another line of *B. subtilis* will be grown on Columbia blood agar (supplemented with 5% human blood). Haemolytic colonies will be collected and placed in Luria broth, centrifuged, and plated in the same manner as the first group of spores. After timed intervals, at 37°C, the slides will be stained with May Grunwald-Giemsa stain and observed under a microscope to determine adhesion characteristics of *B. subtilis*. There have been challenges with contamination of the Caco-2 cells by other microbes and therefore, we are still refining adhesion assays and collecting data to be presented at the research celebration.

U.14 Cultural Entomology Database

Danielle VanBrabant
Co-Authors: Abigail Reinke, Keaton Unrein, Rebecca Schnabel, and Cody Babcock
Advisor: Barrett Klein, Biology

Cultural entomology is the study of how insects influence and have shaped human culture throughout history. A broad and loosely defined topic of study, it deserves both more recognition in its importance to societies around the world, and to the organisms to which it owes its name. This project, which I have been working on for almost a full academic year, is the foundation for what will become a universally accessible online database celebrating the millennia-old connection between human and insect. Such a resource is useful to the progress of this sub-discipline of entomology, and will help the scientific community to develop a greater appreciation for the connection between the arts and the sciences. Coordinated by Dr. Barrett Klein, and myself, a team of undergraduate majors is working on the database, representing several departments here at UW-La Crosse. This has promoted different angles of thinking about and approaching the project. It

is my hope that a mutual understanding and appreciation across disciplines will arise as a result of this endeavor, and other projects like it will follow. We will meet with curators at the Chicago Field Museum in March to discuss digital archiving techniques and have been in contact with various other professionals to discuss the future of the project. We have set up a workflow environment including a digital catalogue of archived items, representing hundreds of scanned and photographed cultural entomology artifacts ranging from comic books to forensic articles to sculpture. In the near future, we will begin programming and transferring files into a beta version of the database, which will be sent to interested educators across the country for feedback.

U.15 Kinematic Predictors of Foot Strike Index in Running

Sabrina Wolter

Co-Authors: Patrick Griffith, Zachary Lammers, Kayla Bushweiler

Advisor: Tom Kernozek, Health Professions

Running is a popular form of exercise which also has significant injury risk. Recent research has investigated foot strike pattern differences in runners and their implications for injury. Purpose: This study was conducted to examine which lower extremity kinematic measure best predicts foot strike index in running. Methods: We measured the kinematics and kinetics of 17 female runners in a controlled laboratory setting performing both a rearfoot and non-rearfoot strike pattern at a standardized pace. Speed was restricted to a specific range. Foot strike index was determined from a force plate and lower extremity position data were determined from motion capture imaging. We used a multiple linear regression to predict which lower extremity positions best predicted foot strike index as well as which could predict foot strike type. Results: Foot strike angle at the time of contact was the best predictor for foot strike index with a correlation of 0.93 for both rearfoot and non-rearfoot strikes. Also, using a binary logistic regression, results showed that foot strike angle was able to predict foot strike type 100% of the time for both rearfoot and non-rearfoot strikes. Conclusion: Foot strike patterns have been a heavily researched topic recently. Foot strike angle compared to other kinematic measures was the best predictor of foot strike index.

U.16 Comparison of Relative Nutrient Availability in Two Stream Ecosystems Located Near La Crosse, WI

Brittany Maule

Co-Author: Eric Strauss

Advisor: Eric Strauss, Biology

Nutrient availability plays an important role in organismal interactions within an ecosystem. The way nutrients cycle through a system can have an impact on the relationships that will develop among the organisms in that environment. For example, an ecosystem's nutrient composition can lead to preferential nutrient cycling—creating nutritional imbalances, and ultimately can dictate some organism behavior. In aquatic systems, studying the effects of nutrients is important as increased nutrients can lead to negative impacts such as eutrophication. To study nutrient availability, the relative elemental composition of nitrogen, phosphorus, and carbon of two freshwater stream ecosystems was analyzed using stoichiometry. Coon Creek and Spring Coulee Creek are both located in the Driftless Area of southwestern Wisconsin, and are dominated by agricultural land cover. Stoichiometric nutritional relationships were analyzed between macroinvertebrates, their food sources, and the stream water. Results show Coon Creek exhibited several factors that imply nitrogen limitation, while trends signify Spring Coulee is more phosphorus limited. Because land cover use is similar between the two streams, future research includes analyzing how differences in nitrogen and phosphorus availability have occurred.

U.17 The Distribution of Private Religion through Jewelry at the Main City of Amarna

Amy Seelow

Advisor: David Anderson, Sociology and Archaeology; Mark Chavalas, History

Religion at Amarna, an important city in 18th Dynasty Egypt, is typically regarded as monotheistic. However, instances of polytheism are evident throughout the site, and its distribution seems connected to social class. Here I analyze jewelry representing polytheism, using object find lists from Borchardt's (1980) excavations, as well as the EES (Online Database) and published material from the Kemp and Stevens (2006)

excavations of the early 2000s. I examine the houses in which this jewelry was found, and I consider these houses in terms of social standing. By doing so, I can see the distribution of polytheistic beliefs across the city to see who was truly engaging in the ruler Akhenaten's monotheistic ideal.

U.18 A Wolf in Sheep's Clothing: Is Academic Success Related to Affective Psychopathy?

Anthony Folino

Advisor: Alexander O'Brien, Psychology

Past research conducted by Baniak, Neumann and Hare (2010) found that individuals in a corporate setting with high psychopathic trait scores were perceived by their coworkers as good communicators, and strong strategic thinkers with creative/innovative abilities. In addition, relative to employees in low-level positions, a higher proportion of individuals in positions of senior management possessed psychopathic traits. Similarly, Howe, Falkenbach and Massey (2014) found that individuals employed at a New York metropolitan financial institutions scoring high on interpersonal-affective psychopathic traits had higher annual incomes and were more likely to hold positions of higher corporate rank, relative to employees who did not display interpersonal-affective psychopathic traits. Little to no research has been conducted on psychopathic traits and success amongst college students. This study investigates the relationship between students' perceptions of their own academic success, as measured by a modified version of the subjective career success scale, and psychopathic traits (as measured by the Self-Report Psychopathy (SRP-III) scale) amongst college students.

U.19 Differential Diagnosis on Pathological Hopewell Remains from the Overhead Site (47-Lc-20)

Anna Maroon

Advisor: Constance Arzigian, Archaeology

This study analyzes a set of skeletal remains from the Overhead Site (47-Lc-20) in southwestern Wisconsin. The site consists of two burial areas, which date to the Middle Woodland period, between AD 100 and 200. The remains excavated at this site were found with artifacts consistent with the Hopewell Culture. Individual B was uncovered from Burial Area B with apparent skeletal pathologies. Using the method of differential diagnosis, this research differentiates between skeletal damage caused by occupational stress and pathological damage, with the direct goal of determining which pathological condition was the most likely cause of the lesions found on both the axial and appendicular skeleton. This contrastive analysis has determined that the occupational stress caused extensive thickening of the occipital and parietal lobes, adjacent to the lambdoidal suture, as well as arthritic lipping of cervical vertebrae 3 through 7. Additionally, it has eliminated Mycobacterium tuberculosis as a potential cause of the pathological lesions found on C7, T2, T5 through T8, T10, T12, and L1 through L5, as well as the appendicular skeleton, in favor of more likely pathological conditions.

U.20 The Effect of Foot Strike Pattern on Achilles Tendon Stress and Strain During Running

Rachel Schornak and Tyler Thorsen

Advisor: Robert Ragan, Physics

Achilles tendon injuries are common among athletes, especially in runners. We compared the Achilles tendon stress and strain for rearfoot strike and non-rearfoot strike patterns in female runners. In the lab, we used computer modeling software to calculate muscle forces in running. Fourteen female subjects were tested for both rearfoot strike and non-rearfoot strike. Each subject ran at a controlled speed. The computer software used marker data from motion analysis and ground reaction forces measured from the force plates to estimate the forces from the gastrocnemius and soleus using static optimization. From published anatomical and elastic tendon properties, we calculated the stress and strain on the Achilles tendon for each trial. We compared Achilles tendon stress and strain for the rearfoot strike and non-rearfoot strike patterns. Differences in these loading characteristics may provide insight into running-related injuries.

U.21 Effects of Stress on the Expression of Urocortins in the Rat Stomach

Elijah Germa
Co-Author: Sumei Liu
Advisor: Sumei Liu, 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 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 changes in gastrointestinal function. Urocortins exert their biological actions via interaction with members of the G-protein coupled receptors – CRF1 and CRF2. Previous studies found that stress elevates CRF mRNA levels in the brain regions involved in regulation of gastric function and in the stomach. However, CRF has a much weaker affinity for the CRF2 receptors compared to the three urocortins. The purpose of this project is to determine whether stress also upregulates Ucn 1, Ucn 2, and Ucn 3 expression in rat stomach. Male adult Sprague Dawley rats were placed under restraint stress for 1 h. Controls were allowed to move freely in their cages without restraint. Rats were euthanized immediately after stress. The stomach was removed and stored at -80°C. The peptide levels of Ucn 1, Ucn 2, and Ucn 3 will be measured by enzyme-linked immunoassay. We hypothesize that stress will upregulate Ucn 1, Ucn 2, and Ucn 3 peptide levels in the rat stomach. Higher levels of urocortins will act on the CRF2 receptors in the stomach to slow down gastric emptying. The 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 into how the negative effects caused by stress can be controlled.

U.22 Comparing Different Methods of Estimating Achilles Tendon Tension in Running

Elizabeth Mattson, Tom Zimmer, and Adam Bortz
Advisor: Robert Ragan, Physics

Several different methods have been used to estimate Achilles tendon (AT) tension during human movement. Some studies use inverse dynamics, where the ankle moment and AT moment arm are used to calculate AT tension. Other studies use much more elaborate techniques such as static optimization to calculate muscle and tendon forces. In the present study we compared AT tension calculated both ways to better understand how they differ. 15 female subjects ran while fifteen digital cameras (180 Hz) recorded the motion, and a force plate platform (1800 Hz) measured the ground force data. From the kinematic and kinetic data, ankle moments and muscle forces were calculated during the contact phase of running. AT tension was similar but slightly higher when calculated with static optimization. This is what one would expect because of co-contraction of dorsiflexor muscles. Our results show that either technique could be used for studies of AT tension in running.

U.23 Comparing Bone Stresses of Running and Jumping in the Legs of Female and Male University Athletes

Shannon Klein and Zach Tooley
Co-Author: Eric Snively
Advisor: Eric Snively, Biology

Background: Female college athletes have a more gracile (slender) body type compared to males. We tested whether a female runner and a robust male wrestler had similar stresses in their tibias (lower leg bones), comparing forces from running and jumping on force plates, and simulated stresses on engineering models of our own bones. We anticipated greater stresses in the male athlete, who has 1.4X the mass of the female athlete. Hypothesis: The male college athlete's tibia will experience greater stresses during both running and jumping as compared to the female college athlete. Methods: Force plates: The subjects tested running and jumping on force plates. Fifty markers were placed on the subjects' bodies to identify certain positions. Eight trials were performed on each foot per activity, and running speed kept constant. The subjects jumped over an elevated ladder-bar and maintained positioning on the force plate. Stresses: We constructed finite element (stress and strain) models from the female Visible Human CT scans (NIH), and modified them with

caliper measurements of our own bones (lengths from joint ends, and subcutaneous width of the tibia). These models, bone material properties, and forces from force and pressure plates were subjected to finite element analysis in Strand7. Mean stresses from five step-cycle forces were compared between the male and female tibias. Results and conclusions: Footfall (ground reaction) forces and stresses in both athletes were moderate, expected from the low speeds and low height of the ladder-bar. Force magnitudes correlated with the athletes' masses (1.4X greater for the male). The athletes abilities were not tested to their full potential. However, the results contradict our hypothesis- compressive stress in the female tibia was about 16% greater than in the male. This was surprising, because both sprinting and wrestling are explosive sports, and the male is heavier.

U.24 Conscious vs. Unconscious Primes: Eliciting Prosocial Behaviors in the Presence of Bystanders

Megan White and Allyson Satterstrum
Advisor: Betsy Morgan, Psychology

The bystander effect refers to the phenomena where the presence of others reduces the likelihood of a person in need obtaining help. This study explores conditions under which the bystander effect can be lessened through priming. Priming is a stimulus that increases the chances of a person engaging in a related behavior. Sixty participants will be randomly assigned to one of three conditions: a conscious prime, an unconscious prime and a control condition. The conscious prime is a video game that requires helping behavior to win, whereas the unconscious prime includes flashes of fearful facial expressions. The neutral condition is a basic computer task. Pencils will be dropped in order to measure participants' helping behavior. We hypothesize that unconscious priming will be more effective than conscious priming in increasing prosocial behavior in both short-term and long-term scenarios.

U.25 The Presence of Levallois Blades at Hadži Prodanova Pećina, Serbia

Sarah Stepanik
Advisor: Constance Arzigian, Sociology/Archaeology

How and why Neanderthals were superseded by anatomically modern humans is still unknown, as Neanderthals have long been known to have both biological and complex cultural adaptations that were well suited for living in Middle and Late Pleistocene Eurasia. However, by 30,000 years ago, Neanderthals were gone. More sophisticated stone tool technology has been proposed to be one of the mechanisms that allowed modern humans to out compete our Neanderthal cousins. However, at a few sites across Europe, archaeologists have discovered blades produced with the Levallois technique associated with Neanderthals. This project discusses technological analysis of twelve of these proposed blades from the site of Hadzi Prodanova Pecina in Serbia and places them within a broader cultural and social context.

U.26 Officer-Worn Cameras: Can They Be an Effective Tool for Law Enforcement Personnel in the La Crosse Area?

Erik Kullerud
Advisor: Carol Miller, Sociology/Archaeology

The purpose of this research is to discover attitudes about the impact of law enforcement personnel wearing body worn cameras. The recent increase in highly publicized events in which law enforcement personnel are believed to have abused their appointed power has resulted in government officials pushing to decrease tensions and improve the relations between law enforcement and citizens. Cameras worn on the body of law enforcement agencies is one solution that has been implemented in order to address these tensions. The dramatic rise in the use of this new technology with little research or data on the subject has raised concerns from governmental officials and citizens on the effectiveness and need for body worn cameras. To understand attitudes about this new technology a survey was emailed to 2,000 students at UW-L and interviews were conducted of local law enforcement personnel. The survey and interview data allow for a comparative study identifying areas of concern that should be addressed before implementation. The results reveal similarities and differences in attitudes between citizens (students) and law enforcement about the effectiveness of body worn cameras as a tool in reducing hostile encounters, while also helping to curb false

complaints. The information can be used in the implementation, creation of proper procedures, and communicating the risk and benefits to the local community.

U.27 Effect of the Antimicrobial SK-03-92 on Growth of Yeast Mutants

Kingsley Ozongwu and Gabriel Dalio Bernardes Da Silva
Advisor: Anne Galbraith, Biology

Antibiotic overuse has led to a lack of antibiotics capable of treating some bacterial infections. Mycophyte LLC, a company founded in 2005 by four UW-L faculty members in three different science departments, has developed a library of over 200 compounds based on naturally occurring antimicrobials found in some plant species. Such work has resulted in the development of novel Intellectual Property with several patent applications being filed, including one focused on an antimicrobial named SK-03-92. In order to increase the industry attractiveness and commercialization potential of this novel drug, it is important to elucidate the compound's mechanism of action (i.e., how it kills). Not for lack of trying, little progress has been made thus far at determining the mechanism of action using bacterial species, mostly because there is no good bacterial model system killed by the drug. Our lab has learned recently that the model yeast, *Saccharomyces cerevisiae*, is susceptible to the killing effects of SK-02-92. Therefore in an attempt to elucidate the drug's mechanism of action, we are now using this well-established genetic model system and examining the effect of the drug on several mutant yeast strains versus wild-type. Results of this work will be presented.

U.28 Fisher Mounds and the American Bottom

Amanda McMahon
Advisor: Constance Arzigian, Archaeology

The Mississippian culture, most noted for their large city of Cahokia, began expanding from the American Bottom area of Illinois about 1050 AD and establishing new colonies and villages along the Mississippi and Ohio River valleys. The spread of the culture north is not as well understood. The Fisher Mounds site in Stoddard, Wisconsin, is one of just a handful of sites in the Upper Midwest with evidence of a Terminal Late Woodland (also known as "proto" or "emergent" Mississippian) occupation. Since its discovery in 2001, this early incursion of Mississippian peoples from the Cahokia site and the American Bottom in Central Illinois into the Northern Hinterlands has been a source of intrigue. This study compares the local and exotic materials found in the Terminal Late Woodland levels to examine what lithics the Mississippian people brought from Illinois to the Fisher Mound site and how the visitors also used the local raw materials. The over-all assemblage was then compared to the BBB Motor site in the American Bottom to see how it compares to contemporary core Mississippian lithic assemblages.

U.29 Examining Seasonality from the Comparison of Fatty Acid Residues on Archaeological Pottery from the La Crosse Region

Jennifer Keute
Advisor: Constance Arzigian, Sociology/Archaeology

A number of pottery shards from two sites in the La Crosse region (A.D. 1400) were tested for fatty acids left behind from the cooking or storing of materials. When unglazed pottery from antiquity is used, specific fats from the contents are trapped in the walls of the vessels. Examining these can tell us about subsistence and diet, but also seasonality. Based on the faunal assemblages from the sites being compared, Swennes (47LC333) and Pammel Creek (47LC61), it has been suggested that these sites were occupied at different times of the year. Analysis using Gas Chromatography/Mass Spectrometry identified the fatty acid ratios of the pottery found at both sites and is used to evaluate this hypothesis.

U.30 Optimizing the Detection Circuitry of Quantum-Dot-Based Single-Photon Detectors

Cole Paulsen
Advisor: Eric Gansen, Physics

The development of single-photon detectors is critical to advancing low-light measurements in fields such as quantum-information technology. QDOGFETs (quantum-dot, optically gated field-effect transistors) are

single-photon detectors that consist of a single layer of quantum dots, nanometer-sized islands of semiconductor material, embedded in a specially designed GaAs/AlGaAs high-electron mobility transistor. In QDOGFETs, the quantum dots act as optically addressable floating gates for the transistor channel. During operation, the QDOGFET channel is wired in series with a load resistor and a voltage is applied across the components causing a current (I) through the transistor and resistor. The amount of current is controlled by the voltage applied to the transistor's gate (V_g). When a photon is absorbed in the QDOGFET, a quantum dot is photo-charged which screens the electric field produced by the gate, effectively changing V_g . This, in turn, causes a change in the current as dictated by the transconductance (dI/dV_g) of the transistor. Electrical noise can obscure the photoresponse of the detection system. Electrical noise is proportional to the temperature of the QDOGFET, and as a result, it has limited the operating temperature of QDOGFETs to near 6 Kelvin. Cooling QDOGFETs to this temperature adds cost and complexity to the detection system. The aim of my research is to optimize the photosensitivity of the QDOGFET detection circuitry so the operating temperature can be raised. I will present the results of optical measurements showing how the sensitivity (quantified by the signal-to-noise ratio) depends on load resistance, detection frequency, and operating temperature and will show that by optimizing the load resistance, QDOGFETs can detect single photons with a signal-to-noise ratio of approximately 3:1 at 77K. Finally, I will outline plans for making these devices suitable for commercial applications.

U.31 Illustrating the Past

Sarah Schultz

Advisor: Binod Schrestha, Art; Constance Arzigian, Archaeology

Archaeological illustration is a sub-discipline of archaeology that brings together both art and archaeology. Archaeological illustrators must capture an image exactly as it is by drawing with meticulous detail. Although Archaeological Illustration is much more time consuming than photography, it's more sensitive in the fact that artists can remove any irrelevant parts of an artifact and depict them in a way that they can be used and interpreted by others. For my grant I learned the techniques used in archaeological illustration and applied them in a series of reconstructive drawings and artifact illustrations. The artifact illustrations were of prehistoric pottery, lithic projectile points and historic ceramic pipes. The reconstructive drawings were a series of illustrations depicting how the Oneota cultures constructed and fired their pottery. A number of these illustrations are now featured in a local museum in Rock Island WI.

U.32 Radiocarbon Dating of Lake Sediments for the Development of a Climate Record for the Ancient Settlement of Aztalan (A.D. 1000-1250)

Ryan Sneath

Co-Author: Samuel Munoz

Advisor: Joan Bunbury, Geography and Earth Science

The ancient community of Aztalan, located in Jefferson County, southeastern Wisconsin, was occupied by the Mississippian people early in the 11th century until ~A.D. 1250. It is not clear what factors were responsible for the abandonment of the site, however one possible explanation is that of climate change, and the timing of the abandonment corresponds with a cooler period known as the "Little Ice Age". Unfortunately, records of past climate in close proximity to Aztalan are lacking, therefore, the aim of this research is to develop a local climate record to better understand the environmental conditions that made this area desirable and then undesirable for the Mississippian people to inhabit. Lake sediments accumulate and store physical, chemical, and biological information over time and can be used to develop past climate records. In January 2014, a lake sediment core was collected from Mud Lake, a small kettle lake located ~3 miles southwest of the Aztalan site. An important step in the development of a climate record is to determine the ages of the sediment layers, which is done through the extraction of organic material from various levels in the sediment core. This process will be presented and discussed.

U.33 Designing Better Antibiotics: Modeling the Interaction Between Model Antimicrobial Peptides and Detergent Micelles

John Weirich and Brianna Haight

Co-Authors: Oliver Lequin, Lucie Khemtemourian, Ludovic Carlier, and Adrienne Loh

Advisor: Adrienne Loh, Chemistry and Biochemistry

With rising disease rates and decreasing effectiveness of conventional antibiotics, there is an immediate need for new antibiotics. One promising solution is through positively charged antimicrobial peptides, which act by perturbing bacterial membranes. We are investigating model peptide antibiotics composed primarily of the hydrophobic, branched amino acid Aib (α -aminoisobutyric acid), which is often found in helical peptides due to steric hindrance at the α -carbon. Positively charged lysine residues were placed in adjacent locations in the center of the helix (KK45) or one full turn apart (KK36). Micelles of the detergent molecules dodecylphosphocholine (DPC) or sodium dodecyl sulfate (SDS) were used as neutral or negatively charged membrane models, respectively. The interaction of model peptides with micelles can provide valuable information about the role of helical structure and peptide charge distribution on peptide-membrane interactions. Here we present thermodynamic and spectroscopic data characterizing the peptide-micelle interactions. Binding enthalpies for the interactions of KK36 and KK45 with DPC and SDS micelles were measured using isothermal titration calorimetry (ITC). It was determined that binding to SDS micelles is favorable, or exothermic, while binding to DPC micelles is unfavorable, or endothermic, indicating that charge interactions dominate the binding enthalpies. In both cases, KK45 has a more favorable binding enthalpy than KK36, suggesting that charge distribution (and not just total charge) is also important. NMR measurements that indicate which regions of the peptides are buried in the micelle indicate that KK45 is more buried than KK36 in SDS micelles, and that both peptides are more buried in SDS micelles than in DPC micelles. These results suggest that the peptide-micelle interactions are enhanced with KK45, due to greater charge density and/or a more favorable helical structure.

U.34 An Analysis of the Conformations of Hydroxamic Acids

Eric Ruzicka

Advisor: Heather Schenck, Organic Chemistry

In drug development, one focus of anticancer and metal binding ligands has been directed to the study of Hydroxamic Acids (HAs) due to their ability to bind to metals, primarily iron. Hydroxamic Acids present the ability to flip between E conformation and Z conformation. However, it is only in the Z conformation that the HAs exhibit the high affinity of iron binding. This special property is used in the medicinal field for blood disorders and anticancer medicine due to the HA's ability to prevent de-acetylation of histones. The purpose of this research is to investigate the impact of a portion of the HA on the HA's structure, and to analyze the different conformations the HA exhibits over time by Nuclear Magnetic Resonance spectroscopy.

U.35 Paclitaxel and the Stabilization of Microtubules

Scott Ericson

Advisor: Taviare Hawkins, Physics

The cytoskeleton, which contains actin filaments, intermediate filaments, and microtubules, is crucial to cell motility and function. Microtubules, in particular, are responsible for intracellular transport and for the organization of organelles, including chromosomal separation during mitosis. In neurons, they align uniformly to allow for transport along the entire length of the axon. Differences in the rigidity of microtubules result in disruptions of these processes, causing conditions like Alzheimer's disease and making them the target of chemotherapeutic drugs such as paclitaxel. By measuring microtubule rigidity after assembly without the use of paclitaxel, we hope to acquire strong data on their mechanics and to better understand the effect of this drug. We do in vitro studies on thin chambers using fluorescence microscopy to capture image sequences of 1000 frames. These are analyzed using computer software to determine structural rigidity and persistence length, the measurement of a structure's stiffness. Comparing this data to that of previously-acquired stabilized microtubules will begin to clarify the effects of paclitaxel on microtubule mechanics.

U.36 The Effects of Chronic Caffeine Exposure on Muscle Fiber Excitations in *Drosophila melanogaster* Larva

Mary Sagstetter

Advisor: Bradley Seebach, Biology

Adenosine helps to regulate many functions of the human body, such as vasoconstriction/vasodilation of blood vessels and immune responses. Also, adenosine regulates the functional processes within the brain,

such as sleep and locomotion, by modulating neurotransmitter release. Caffeine antagonizes the adenosine receptors and prevents the subsequent regulatory actions of adenosine. By temporarily blocking these receptors and causing an imbalance in neurotransmitter release, caffeine temporarily attenuates the onset of sleep and in higher amounts have undesirable acute effects such as uncontrolled muscle tremors. However, the physiological impacts from the chronic use of caffeine on locomotor circuitry development have not been fully investigated. One study compared the effects of acute exposure on locomotor abilities in adolescent and adult rats. This study showed the caffeine-induced locomotor stimulations were higher in adolescent rats than in adult rats. Similar to this study in rats, this project sought to draw similar conclusions by using *Drosophila melanogaster* larva under chronic exposure to caffeine. The larva were exposed to a high concentration of caffeine (2.5 mg/ml) present in their food for approximately one week. Once the larva reached third instar stage, they were removed from the food media and placed on an agarose plate to record their locomotor movements. Afterwards, they were prepared for electrophysiology experiments to record the muscle fiber excitability in saline and caffeinated saline. These recordings were analyzed for the frequency of muscle contractions and excitatory post-synaptic potentials (EPSPs). Early analysis has not produced conclusive results. In the final analysis, I expect the data to show an increase of EPSPs in caffeine-exposed larva as opposed to non-exposed larva.

U.37 La Crosse, WI Native Canids: Population Composition and Human-Wildlife Overlap

Christina Burkhart
Advisor: Eric Snively, Biology

The extirpation of the wolf from Wisconsin disrupted the food web and allowed its smaller cousin, the coyote, to expand into the newly vacant niche. In addition to its perseverance and adaptability, the coyote, like the wolf, excels at excluding species that compete for the same resources. With that knowledge, the purpose of this study was to test the hypothesis that without the wolf present to hinder the coyote population, the coyote has succeeded in suppressing its competitors (the red and gray fox species). As guidelines for the project, the objectives were to estimate the population composition of the three remaining canid species within the La Crosse area (including Hixon forest and the marsh) and to gauge the breadth of overlap between those species and that of humans. Analyzing the bluffland canid populations and the extent of human-wildlife overlap was accomplished indirectly using surveys and open interviews, and directly by physically scouting the blufflands and the marsh to quantify both human and wildlife sign. Surveys and open interviews have placed coyotes and fox throughout the marsh and blufflands, in both high and low human-traffic areas. Furthermore, systematic tracking has produced supporting data that there are moderate levels of coyote activity and lighter levels of fox activity, thus far defined by types and frequencies of trails encountered, as well as potential den sites. Highly active trails were the target locations for the trail-cams, which will provide visual evidence of what and how many species are active in the immediate area. Overall, a general species composition of the bluffland region will provide a measure of the richness of the local biodiversity, even when human intrusion is frequent, and give insight as to whether the La Crosse area has a substantial habitat mosaic to adequately support all three species.

U.38 Effects of Roadways in Wetlands on Dragonfly Communities

Riley Buley
Advisor: Alysa Remsburg, Environmental Studies

Wisconsin wetlands have been affected by significant amounts of roadwork development in the past few decades. The purpose of this project was to observe if the altered shoreline slopes required for roadways constructed in wetland areas affect larval dragonfly and damselfly (Odonata) communities. Another objective was to observe whether larval instar stage affects where larvae occur within a wetland. By comparing samples taken in shallow waters adjacent to natural wetland shorelines with samples taken adjacent to roadway banks, we expected to find a change in populations and species assemblages of dragonfly larva. Odonata samples and vegetation structure measurements were obtained from 11 plots. Wilcoxon Signed-Rank tests were used to compare species richness and abundance between altered and natural wetland paired plots but no significant differences in species richness and abundance were detected. 203 specimens were collected within 10 species categories. Spearman correlation tests were used to investigate possible relationships of odonate larval abundances and larval sizes with vegetation and shoreline characteristics. Results showed that larval species richness was positively correlated with emergent stem counts of aquatic vegetation. Abundance of all odonate larvae was found to be greater at plots with emergent vegetation in

slightly deeper water and with shorter emergent vegetation. This data raises lots of questions about where odonate larvae are most abundant within wetlands, but it suggests that some odonate species, such as *Anax longipes*, may not be harmed from constructing banks with steeper slopes. Later instar larvae of *A. longipes* may even be more abundant in emergent vegetation that gets established near constructed wetland roadways.

U.39 Exploring the Development of Profound Understanding and Critical Thinking in Children through Social Justice Literature

Kelsey Kutzke and Camille Driscoll
Advisor: Wen-Chiang Rita Chen, Educational Studies

The purpose of our research is to explore the profound understanding and development of critical thinking skills in children through the use of social justice literature. Specifically, we would like to focus on how critical literacy and culturally relevant texts motivate young at-risk children (K-2) to read and develop profound comprehension. As future educators, we recognize the student population in the United States has become increasingly diverse. To address diverse needs in schools, we conducted this social justice study in an after-school tutoring program where most of the students we work with have low academic achievement and behavioral problems. This high-need school is located in a low socioeconomic community. About 80% of the students are eligible for free or reduced school meals. To conduct our research, we chose books that address important social justice topics that may be uncomfortable, but possibly related to the child's life.. We focused on issues of poverty and racism because these are the two major issues that keep occurring in our study. Through our research, we want to see how the literature engages the students to think critically and connect these issues to their own lives and the world around them. Data collection includes tutoring observation notes, student artifacts, videos, and pictures. Here are some questions to guide us through our inquiry: 1. How does text selection make a difference in students' learning? 2. In what ways do culturally relevant texts support at-risk students' motivation and comprehension in reading? 3. How does infusing critical literacy and teaching for social justice in our teaching engage us in risk-taking, changing, reflecting, and improving our instruction?

U.40 Delaying Degradation—Ethanol and Sodium Acetate Preservation Methods for Environmental DNA

Bridget Ladell
Co-Authors: Liza Walleser, S. Grace McCalla, and Jon Amberg
Advisor: Jon Amberg and Roger Haro, Biology

Environmental DNA (eDNA) collection methods from water samples depend almost exclusively on temperatures of 4 °C and below. Because of the fragility of DNA, this dictates the careful handling of eDNA samples for to be viable for experimentation. This requirement can severely limit collections from remote field locations. Developing a preservation technique to maintain eDNA integrity at temperatures 20 °C and above would allow a wider range of locations to be sampled. Here, we simulate and test an ethanol and sodium acetate solution to maintain the integrity of the DNA samples for the time between collection and lab testing. Water samples were taken from a tank housing Asian carp and placed in different testing environments, on ice or at room temperature. Each environment housed samples that were left untreated and samples that received the ethanol and sodium acetate solution. With each passing day, for 7 days, samples were taken out and subjected to extraction and qPCR with genomic markers. Analysis of DNA copies showed comparable levels between samples that were iced and samples that received treatment and remained at room temperature. We found that DNA can be amplified using an ethanol and sodium acetate solution after at least seven days at room temperature, with the potential for a more extended time.

U.41 Portraits and Frames: Cultural Conflict from the Dedication of the Ten Commandments Monument to the Sale of Cameron Park Land, June 1965-August 2002

Matthew Nicholson
Advisor: Victor Macias-Gonzalez, History

This research project examines the history and structure of cultural conflict in the United States since The Second World War. It seeks to explain how and why people disagree on the role of religion in public spaces and contest the content of public monuments. It establishes a framework of cultural conflict through an integration of James Hunter's Culture Wars Theory and Antonio Gramsci's prison writings. The framework is then applied to a local controversy about a Ten Commandments monument placed in Cameron Park. This project identifies the cause of cultural conflict as opposite understandings of morality, which lead to different views of what is acceptable in public space. Additionally, it finds that the only resolution to conflict is domination and institutionalization of one moral understanding.

U.42 Does Embryonic Exposure to Triclosan Impair the Ability of Zebrafish Larvae to Capture Prey?

Ryan Paukert
Advisor: Tisha King-Heiden, Biology

Many personal care products have been recently discovered to be hazardous to aquatic environments. Triclosan (TCS), an antibacterial and antifungal agent, is widely used in products such as soaps, toothpastes, disinfectants, detergents, cosmetics, and pharmaceuticals. TCS is a suspected endocrine disruptor and developmental contaminant, but the implications of TCS and its toxicity are still not well understood. Recent studies in our lab have shown that early exposure of TCS impairs the development of craniofacial structures in zebrafish larvae. The purpose of this experiment is to see if these craniofacial malformations affect the ability of zebrafish larvae to capture prey. Zebrafish embryos were exposed to various concentrations of TCS during early stages of embryonic development. When the zebrafish reached the larval stage of development, they were graded on their ability to capture prey items. This information will help explain the environmental impacts of this rising contaminant.

U.43 Reconstructing a Recuay Feasting Event at Hualcayán, Peru through Ceramic Analysis

Hannah McAllister
Co-Authors: Rebecca Bria and Elizabeth Katherine Cruzado Carranza
Advisor: Tim McAndrews, Sociology/Archaeology

Although research of the Recuay Culture has heavily focused on the practices and materials of Recuay feasts, these studies are limited to a few archaeological sites. Consequently, the variation of Recuay feasting practices between communities in highland Ancash is still unclear. This poster presents a typological and spatial analysis of Recuay ceramics excavated from the archaeological site of Hualcayán to reveal the local ritual practices of food preparation and consumption during the Early Intermediate Period (1-600 AD) in this ancient community. This ceramic assemblage was recovered from a large D-shaped patio group enclosure in which ceramics were burned, smashed in place, and associated with a variety of carbonized plants, suggesting they are the remains of feasting. The typology of the ceramic forms will be used to illustrate the range of food practices during a distinct feasting event in this D-shaped structure and the spatial arrangement of separate food preparation and consumption areas will be used to recreate the specific activities of feasting. Finally, these results will be compared with ceramic assemblages from other Recuay community sites in order to examine variation in Recuay feasting.

U.44 Examination of an *omrAB* Mutant on Type 1 Pilus Expression and Survival in *E. coli*

Craig Grosshuesch
Co-Author: Ina Wu and William Schwan
Advisor: William Schwan, Microbiology

Urinary tract infections (UTIs) are extremely common in the United States and are primarily caused by uropathogenic *Escherichia coli* (UPEC). To successfully adhere to the bladder wall, UPEC produce structures known as type 1 pili. In addition, two small, regulatory RNAs (sRNAs) named OmrA and OmrB are involved in the osmotic stress response that UPEC exhibits when placed in the mouse or human urinary tract. Some preliminary studies had suggested that OmrA and OmrB may regulate genes involved in the production of type 1 pili. In this study, an *omrAB* mutation in a UPEC strain was created and complemented with a full-length *omrAB* DNA segment. A preliminary in vitro hemagglutination experiment was performed to assess type 1 pili expression using the unmutated wild-type strain, the mutant strain, and the

complemented mutant strain grown in unbuffered Luria broth. The omrAB strain had a higher hemagglutination titer than the wild-type bacteria, indicating that higher type 1 pili expression occurred in the mutant strain than in the wild-type or complemented strains. In a separate experiment, the three strains were transurethrally injected into mice. The bacteria were allowed to colonize the mice for three days and the mice then had their bladders and kidneys removed and homogenized. The mutant strain showed a three-log decrease in colony forming units per bladder compared to the wild-type strain. Our results suggest that OmrA and OmrB appear to regulate type 1 pili expression and are necessary for infections of the murine urinary tract.

U.45 Talking about the Past: Ho-Chunk Oral Histories

Mackenzie Miller

Advisor: Elizabeth Peacock, Sociology/Archaeology

Oral Histories can express a culture's beliefs and relate to how they came to be. Each culture has beliefs that were shaped by past events occurring within the community and by external forces working upon the culture. By knowing how the beliefs came to be, one has a better understanding of current actions taken. These beliefs are often upheld by stories told to the younger generations, such as fairy tales or mythology. While there are two tribes who call Hoocąk their native language, there are currently only about 200 fluent speakers. This language loss is largely occurring due to the monolingual English ideology followed by the larger American Society. This requires one to look at how and when Hoocąk is being used in modern society to help preserve the language, thus the culture. This also places need to record any oral / histories in the attempt to identify information about the past that has been passed on through this traditional medium. This information should shed light on how members of the Ho-Chunk Nation view their language and today, in addition to acting as another tool for research since there is a bias in much of what was historically documented.

U.46 Are You Good Without God?: Effects of Religious Identity Affirmation and Threat

Elizabeth Reesman and Matt Malczewski

Advisor: Katherine Kortenkamp, Psychology

Research has established how classic social identities such as race or gender can be important in determining individuals' performances. In particular, it has been found that a stereotype threat to a social identity can decrease performance of tasks, both physical and mental. Conversely, affirmation of one's identity can boost performance. Research has not yet explored whether or not religious identity is as important in determining performance associated with society's stereotypes of religiosity. Considering the prevalence of religion as a societal topic of interest, it would be beneficial to understand the role of religion in this phenomenon. The study will assess 100 midwestern university students' ability to cope with a stressful situation based on affirming or threatening their self-reported identity. These 100 students will be consisting of both highly-religious individuals as well as atheists. It is hypothesized that students will experience less anxiety, after an anxiety-inducing situation, when they have their particular religious identity affirmed than when their religious identity is threatened. Furthermore, we hypothesize that religious people faced with a threat to their religious identity will experience less anxiety than atheists faced with a threat to their non-religious identity. If the hypotheses are supported, this study could provide information on additional techniques for coping in anxiety-producing situations. Such techniques could provide insight into psychological well-being and public health practices in anxiety-producing situations, as well as add to the body of knowledge existing in positive psychology.

U.47 Perception-action Coupling in Children Diagnosed with Autism Spectrum Disorder

Michael Schiller

Co-Authors: Lauren Bradley, Trevor Dominy, and Rachel Medenwaldt

Advisor: Attila Kovacs, Exercise and Sports Science

Diagnosed in every sixty-eighth child born in the U.S., autism spectrum disorder (ASD) is one of the nation's most prevalent disorders. ASD is characterized by underdeveloped social and communication skills and often is related to motor coordination difficulty. Children diagnosed with ASD are reported as having trouble performing ballistic tasks like throwing, catching, and kicking a ball. These ballistic tasks require a complex interaction between perception and action. One has to be able to perceive the spatial and temporal

characteristics of a stimulus, and consequently plan and execute the appropriate movements. Whether the less-than-optimal motor execution performed by children diagnosed with ASD is due to difficulties in perceiving the characteristics of a stimulus (e.g. velocity, trajectory), difficulties in performing the actions to match these characteristics, or a combination of both, is still unknown. To investigate these questions, a series of tasks with systematically varying degrees of perceptual and motor demands have been devised. The three tasks can be characterized as simple reaction time (RT), increased perceptual component reaction time (pRT), and increased motor component reaction time (mRT). Preliminary data suggests that there are no differences in simple reaction timing tests (RT) between children diagnosed with ASD and age and gender matched typically developing controls. Furthermore, the same pattern of results was observed when executing simple motor actions with an increased perceptual demand (pRT). In contrast, when perceptual demands were kept constant, but motor demands were increased (mRT), children diagnosed with ASD showed decreased movement consistency and an increase in timing error. Altogether this pattern of results seems to indicate that children diagnosed with ASD have no difficulties in detecting characteristics of ballistic stimuli or accurately planning and executing simple motor actions to match these stimuli. However, when the planning and executing of more complex actions is required, performance suffers considerably.

U.48 International Students and Financial Institutions: Examining Financial Literacy and the Factors Leading to Banking Decisions

Yen Trinh and Devan Johnson

Advisor: Shane Van Dalsem, Finance

This research will look at the factors most important to international students when deciding which bank to patronize. The purpose of our research is to examine whether or not international students are pleased with their current banking situation and if increased information and banking options would increase their satisfaction with their banking choice during their stay in the United States. Existing literature demonstrates strong preferences for specific services and other characteristics of financial institutions and we wish to further this knowledge by focusing on international students and their financial literacy. We will collect our data using interviews of financial institution marketers and a survey sent out among international students. We expect to find that international students would like more freedom to make their own decision regarding which bank to use, but even given that freedom, may lack the financial literacy to confidently make a decision. If our findings are as expected, this may help the Office of International Education offer more programs to improve financial literacy as well as offer more options for students to choose from when selecting a bank.

U.49 A Lithic Analysis of Food Preparation and Resource Distribution in Recuay Ritual Feasting Contexts at Hualcayán (Ancash, Peru)

Elisabeth Granley

Advisor: Tim McAndrews, Archaeology

The preparation and consumption of food during feasting rituals is an ancient tradition in the Andes, occurring both on a small scale (participation of one family or kin group) and on a large scale (community-wide involvement). This poster presents a recent analysis of lithic tools from Hualcayán, an ancient Recuay community (1-600 AD) in highland Ancash, Peru. Excavations at Hualcayán yielded a variety of ground stone and expedient chipped stone tools and debris from a range of different Recuay ritual contexts—in tombs, patio groups, and enclosures. The analysis and comparison of tool types and the variety of raw materials utilized within each ritual space will be used to identify the different food preparation techniques of Recuay rituals at Hualcayán, as well as examine how resources were differentially distributed amongst members of the community, the distribution of social status and resources at both a family and community level, and a better understanding of Recuay ritual practice in general.

UNDERGRADUATE POSTER PRESENTATION ABSTRACTS

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

U.51 Detection of Heart Damage Markers in Ground Squirrels and Rats Injected with Isoprenaline

Catherine Krus and Cassandra Sauer
Advisor: Scott Cooper, Biology

During hibernation, the heart rate of thirteen-lined ground squirrels (*Ictidomys tridecemlineatus*) is significantly reduced to 3-5 beats per minute. Although there have been no signs of blood clotting in the squirrels, markers of myocardial ischemic damage (reduced blood flow in the heart muscle) in hibernating squirrels has been found. This damage disappears once the squirrel has aroused from hibernation, allowing us to hypothesize that ground squirrels are resistant to heart damage under a low oxygen environment. This raises the question of what a myocardial infarction (heart attack) in a ground squirrel looks like. In this research, we looked for common protein markers that are released into the plasma of humans after having a heart attack and compared these markers in rats and ground squirrels that have been chemically induced to have a heart attack. We looked for two variations of the specific protein troponin: troponin T (TnT) and troponin I (TnI). Blood samples were collected from rats and squirrels previously injected intraperitoneally (into the abdominal cavity) with either saline or isoprenaline, a drug that induces heart damage. There were control and experimental groups of six rats, six non-hibernating squirrels, and six hibernating squirrels. Blood samples were collected at 2, 4, 6, 24, and 48 hours post-injection from the non-hibernating animals. To test for troponin T and I in these plasma samples, we use antibodies against troponin T and I in an immunoblot. We also tested the samples through an ELISA assay. Through the results of these tests, we found that we could not detect either TnT or TnI in the plasma samples of the squirrels or the rats. This indicates that heart cells were not rupturing during the treatments, which would lead to irreversible damage and scarring of the heart.

U.52 Effects of Myocardial Ischemia Induced via Isoprenaline in Ground Squirrels and Rats

Emily Kelm
Co-Authors: Alie Bonis, Jenna Kerr, Catherine Krus, and David Howard
Advisor: Scott Cooper, Biology

Thirteen lined-ground squirrels demonstrate interesting physiological responses during hibernation. When a ground squirrel hibernates, it slows its heart rate down to 3-5 beats per minute. This low heart rate and subsequent low oxygen availability should cause myocardial ischemia, or heart damage, in ground squirrels. Our previous research demonstrated that ground squirrels do indeed exhibit myocardial ischemia during hibernation, but this damage is reversed when the squirrels exit hibernation. These results suggest that the squirrels have mechanisms to resist heart damage when enduring low oxygen conditions during hibernation. The purpose of this research project is to determine if ground squirrels are more resistant to heart damage than rats and also to compare the resistance abilities of awake squirrels to those in hibernation. Heart damage was induced using isoprenaline, a drug which caused myocardial infarctions (MI), or heart attacks, in the rodents. After 48 hours, the hearts of the squirrels and rats were harvested, and a trichrome stain was performed. Myocardial infarction damage is evidenced by the presence of hypereosinophilia, macrophage infiltration, or collagen deposits in the heart sections. Heart sections were given a damage rating on a scale of 1-5 based on the damage to the heart. Results showed extensive damage to the rat hearts with a treated rating of 4.70 compared to a control rating of 1.42. A much smaller gap was seen in damage ratings of treated and control squirrels with non-hibernating treated and control squirrel hearts having ratings of 2.42 and 2.71 respectively and torpor treated and control squirrel hearts having ratings of 1.25 and 1.69 respectively. Comprehensively, the results of this study show that ground squirrels have a greater resistance to heart damage than other rodents. In the future, this knowledge could potentially be used to help find treatments for human heart damage.

U.53 Could Lamellar Blades Have Been Used for Body Modification in Middle Woodland Society: An Experimental Usewear Study

April Rothenbach
Advisor: Jessi Halligan, Archaeology

Blades are a type of stone tool commonly found in the archaeological record, described as stone tools that have lengths that are twice their width and nearly parallel sides. Blades have been classified in many ways in the archaeological literature; one type of blade is the lamellar blade found in Middle Woodland assemblages, whose function is largely unknown. Body Modification practices, namely tattooing, could be one possible function lamellar blades may have had in the past. This hypothesis can most aptly be tested using usewear analysis, one of the few way for the function of stone tools to be identified. I will be conducting usewear analysis on two sets of stone tools, one created by a modern flint-knapper and used in an experimental context mimicking the process of tattooing, and one from Mound House, archaeological site, where the function is unknown. The goal of my research is to compare these two data sets and see if there is any similarity in the usewear patterns that would suggest that they were used for the same activity, tattooing.

U.54 Detection of Immature Red Blood Cells in Ground Squirrel Bone Marrow

Molly Fahrenkrog and Thomas MacGregor
Advisor: Scott Cooper, Biology

The proposed experiment examines changes in reticulocytes (immature red blood cells) in thirteen-lined ground squirrels (*Ictidomys tridecemlineatus*), throughout their hibernation cycle. Testing has been previously done on immature red blood cells, which revealed little variation throughout the hibernation cycle. Once the red blood cells become mature, they aren't easily detected by our previous methods. In order to investigate the mature red blood cell transition, we will need to run immunohistochemical staining on femur samples from the squirrels. By detecting the transition of immature to mature red blood cells throughout hibernation, insight into the process by which the squirrels regulate their circulatory system. Currently, the process of storing blood is very fragile and has a short longevity; if this process can be replicated, there are possible human applications related to blood storage that would be very beneficial.

U.55 The Effect of Handwriting Style on Personality Assumptions

Joseph Deegan
Advisor: Katherine Kortenkamp, Psychology

Though there has been a plethora of research delving into what handwriting experts believe certain handwriting traits to mean about personality, known as graphology, there has been no inquisition into what personality assumptions the layperson makes about individuals based on observed handwriting style. In Experiment 1, 38 college students observed manipulations of four different handwriting traits. First, participants were asked to rate each handwriting sample on a scale for how strongly they believed a certain personality trait was present. Second, participants were asked to match three specific personality traits with three different handwriting samples. In the scale portion of the study there were significant results on two of the four handwriting traits showing that participants personality ratings similar to those proposed by graphologists. Whereas in the second portion the experiment, all four handwriting traits were matched to their corresponding personality traits by participants at a much greater rate than expected by chance. After obtaining significant results in Experiment one, a second study was planned to further extend our understanding of how strongly certain handwriting styles connote personality traits. Data collection for Experiment two will be completed in early March. In experiment two, 75 college students are being asked to match personality traits with what graphologists posit are their corresponding handwriting indicators. However in this portion, there will be twice as many personality traits as handwriting samples in order to make successful chance matching less probable. These results have obvious real-world implications, most notably in scenarios where an individual is submitting some form of a handwriting sample for formal judgment, such as a job application, where the reviewer may be making personality judgments about the individual based on their handwriting alone.

U.56 Experimental Fabrication of Non-Stoichiometric Zinc Tungstate for Use as a Photocatalyst

Matt Wawiorka and Andrew Stuhr
Co-Author: Seth King
Advisor: Seth King, Physics

Introduction/Purpose: The presence of contaminants in Earth's water systems is one of today's most pressing environmental issues. Photocatalysis can be used to remove organic contaminants from water with sunlight, making it a promising method for solving this problem. Zinc tungstate, ZnWO₄, has recently stirred up excitement in materials science research for its prospects as an efficient photocatalyst. The photocatalytic effects of ZnWO₄ have been studied using stoichiometric ZnWO₄, usually in powder form. In our research, we work with thin films of ZnWO₄ and explore how altering the stoichiometry affects the photocatalytic properties. Methods: ZnWO₄ thin films were produced on silicon substrates via spray pyrolysis. Solutions of aqueous Zn, W, and O ions were prepared and sprayed onto heated silicon wafers. This resulted in the formation of ZnWO₄ crystals on the surface of the silicon. The proportion of tungsten to zinc was altered by measuring out varying amounts of tungsten and zinc reagents to form the aqueous solution. X-Ray Diffraction was used to characterize the structure of the ZnWO₄ crystals. To examine the photocatalytic effects of the ZnWO₄ films, a dye degradation reaction under UV radiation was measured with and without the presence of the films. Presentation of Results/Further Research: In our presentation we will outline spray pyrolysis and how it works. Key x-ray diffraction data will be presented and characterization of the crystal structure will be explained. We will highlight the proportions of tungsten to zinc that show breakdown in the ZnWO₄ crystal structure. Photocatalysis will be explained and data on the photocatalytic activity of our films will be displayed. The proportions that resulted in the most activity will be highlighted. Research into optimizing the photocatalytic properties is ongoing.

U.57 The Relationship between Family SES and College Student Stress Levels

Kayla Ballard
Advisor: Katherine Kortenkamp, Psychology

The current study will examine the relationship between the socioeconomic status of a student's family and the student's perceived stress levels in college. Past studies have focused on the relationship between socioeconomic status (SES) and immune function (Adam, Chyu, Dowd, McDade, & Palmero, 2014) and neural integrity (McLean et al., 2012) as well as the relationship between SES and anxiety and depression symptoms (Salami & Walker, 2014). As it stands, there is a lack of research pertaining to the relationship between SES and stress levels in college students in particular. Yet research shows that increased stress predicts lower academic performance (Arsenio & Loria, 2014). For the current study, approximately 200 undergraduate students from UW-La Crosse will complete an online survey to obtain demographic information, financial information, and perceived stress. The financial and perceived stress data will be obtained through the use of the Financial Stress Questionnaire (Fast Track Project, 1994) and the Perceived Stress Scale (Cohen, 1983). It is hypothesized that a lower family SES will be correlated with higher stress levels. Data from the College Board (2013) indicates that tuition has risen a great deal over the past 30 years, which may mean students from lower SES backgrounds need to work more to support themselves in college. Taking that into account, it will be determined whether student employment may be a mediating factor in the relationship between family SES and college students' stress. The data obtained will be analyzed using correlation and regression tests through the SPSS program. This study will allow for a better understanding of the stressors college students face, thus providing universities with information that can be used to better assist students in succeeding.

U.58 Planning for a Future "On the Go": Using GIS to Understand the Behavior of UW-L Commuters

Corinne Rabay
Advisor: James Longhurst, History

The University of Wisconsin – La Crosse campus is a busy place during school hours: everyone is constantly bustling around to get from place to place whether that be by foot, bike, skateboard, car or bus. Despite this, the campus does not currently have an official plan for future transportation needs. Through GIS analysis of the results of a campus-wide opinion survey, information can be provided to those responsible for creating

policies for the campus. The campus-wide survey collected nearest-corner locations that were used to represent the origins of those traveling to campus from throughout the city of La Crosse and beyond. Additionally, the survey gave assorted locations on the UW-L campus that represented the destinations as well as their primary mode of transportation. The nearest corner locations were then entered into a Microsoft Excel spreadsheet and then uploaded into ArcMap and geocoded into physical points on a map. To utilize these points in understanding where/how these individuals got to the UW-L campus, the points were then coded to reflect different transportation modes or different locations on campus. This exercise demonstrates that while most of the UW-L commuter travel within the city of La Crosse occurs closer to campus, there is a great variety of transportation types. Building destinations gives policy makers clues about parking needs and necessity of providing for on-campus pedestrian demand. The results of this analysis show that GIS analysis of commuter behavior can be used to create future transportation policies to make the campus a safer place.

U.59 The Effects of Myrick Marsh Streptomyces on the Growth of Human and Plant Pathogens

Jenna Malinauskas
Advisor: Anita Baines, Biology

Antibiotic producing bacteria have been a focus of study for many years. One area of microbiology that has not been extensively studied is microbial interactions of streptomyces from fresh water sediments. Current research into the genus *Streptomyces* is attracting attention for the bacterium's potential to be used in healthcare and industry. By taking samples of streptomycete bacteria from areas around the Myrick Marsh and classifying them by locality, I have evaluated inhibition of growth using a common human and plant pathogen; *Pseudomonas aeruginosa*. Further testing using *Burkholderia cepacia*, *Burkholderia cenocepacia*, and *Staphylococcus aureus* is currently in progress. Plating technique involves five spot inoculations of streptomyces on Mueller Hinton agar, and after three days incubation at room temperature the pathogen is spread plated on a freshly poured layer of water agar. Preliminary results demonstrate no inhibition of pathogen growth, however; much of the project remains to be completed. As previously stated, there has been minimal research into *Streptomyces* from freshwater sediments. Therefore, research into this field of ecology will provide more information on the elusive streptomyces, and their ability to be used for antibiotic production to benefit industry and health care.

U.60 Online Homework in Introductory Chemistry

Rachel Weier
Co-Author: Anna George
Advisor: Anna George, Chemistry and Biochemistry

Homework is a very important aspect of instruction. Instructors have a variety of instructional tools available including traditional and online homework. This research project is developing a method for determining what topics in chemistry are best reinforced through online homework and which topics are more conducive to traditional homework. Sections of introductory chemistry utilized online homework as part of their courses. Students' performance (n=402) was measured using a pretest and posttest of the 2003 California Diagnostic Exam. Academic gains of students who completed a minimum amount of online assignments were compared to those demonstrated by the students who completed less than the minimum amount of the online assignments. The methodology and any emerging patterns for the comparison of the two groups will be outlined.

U.61 UW-L Writing Center Usage Analysis: How Can We Better Address Students' Needs?

Brittany Maule
Co-Authors: Virginia Crank and Darci Thoune
Advisor: Virginia Crank and Darci Thoune, English

University Writing Centers have long existed to help students improve their writing abilities; however, due to the varied and qualitative nature of this work, quantitative methods for measuring usage and effectiveness of writing centers have not been sufficiently studied. The University of Wisconsin-La Crosse has had a Writing Center for more than 25 years, but it has only been a part of the Murphy Learning Center (MLC) since 2009. Since its incorporation into the MLC, the Writing Center has seen changes in the location and quality of its

facility, changes in documentation, and a large increase in student use. During this period, student data has been collected regularly but never studied. In order to initiate an assessment of UW-L Writing Center usage both in terms of subject matter and student demographics, conference records, and booking data were analyzed from AY 2010-2011 through Fall 2014. To group the three types of conference data collected (all written; two-sheet system; one-sheet system), a coding system was developed to organize all responses into five categories (focus, organization, development, mechanics, and style) to assess what students worked on during tutoring sessions. In addition, class demographics were obtained from conference sheets to examine how department use has changed over time. From this data, insight may be provided into what students actually work on during sessions. Implications of this work include how possible partnerships, workshops, tutor training, and other facets can be better planned to fit students' needs.

U.62 Salt-induced Changes to the Stability of Poly(dA-dT) Tract DNA and Implications for Nucleosome Formation

Jaimi Jensen
Advisor: Dan Grilley, Chemistry and Biochemistry

Inside the nucleus of eukaryotic cells, the majority of DNA is wrapped around proteins called nucleosomes. This protein scaffolding prevents transcription factors from binding, implicating nucleosomes as important factors in regulating gene expression. The exact placement of nucleosomes is influenced by the underlying DNA sequence and poly(dA-dT) tracts highly disfavor nucleosome interactions. Poly(dA-dT) tracts, which contain all deoxy-adenine nucleotides on one strand and all deoxy-thymine nucleotides on the other strand, are depleted of nucleosomes in a manner that depends on the length and purity of the tract. Poly(dA-dT) tracts differ from generic sequence DNA because their equilibrium structure contains a narrowed minor groove. This narrowed minor groove allows a network of ordered water molecules to mediate hydrogen bonds across base steps. The narrowed minor groove also shortens the inter-strand distance between the negatively charged phosphates. We hypothesized that cations that match the geometric constraints of the narrowed minor groove stabilize the unique poly(dA-dT) tract structure. To test this, we used circular dichroism (CD) to monitor the effect of different monovalent cations on the global DNA structure. Using this measurement we have identified specific cations that appear to specifically promote poly(dA-dT) tract structure. Using UV-monitored temperature melts, we found that these same ions preferentially stabilized poly(dA-dT) tract structure relative to generic sequence DNA. When DNA is wrapped around nucleosomes it is deformed away from its equilibrium configuration. Our results imply that nucleosome formation is dependent on the species of cations that are present in solution. To further illustrate this, we have used competitive nucleosome reconstitution assays that test how cation identity differentially affects the ability of poly(dA-dT) tracts to form nucleosomes relative to other DNA sequences. Our work demonstrates that poly(dA-dT) tracts respond differently to specific cations, and that relative nucleosome stability depends on the identity of the cations in solution.

U.63 Effects of Kinesiology Tape on Performance and Serum Creatine Kinase during Recovery from Delayed-Onset Muscle Soreness

Brandon Jones and Jacob Lazendorf
Co-Author: Rokšana Zak
Advisor: Naoko Aminaka, Exercise and Sports Science

Although Kinesiology Tape (KT) has been used for reducing pain and regaining function, no study has examined the effects of KT on reducing the level of creatine kinase (CK) during recovery from delayed onset muscle soreness (DOMS). Objective: Investigate effects of KT on performance and serum CK during 72 hours after fatigue. Design: Randomized control trial. Setting: Research Laboratory. Patients or Other Participants: Preliminary data were taken from 28 college-age participants, who were randomly assigned to the KT (n=8), Placebo (n=8), and Control (n=12) groups. Interventions: The first session involved measurements of single-leg hop for distance (HopD) and counter-movement jump (CMJ), and CK via finger prick. These measures were taken before and immediately after 30 maximum eccentric contractions of quadriceps to induce fatigue. After the fatigue protocol, taping groups received tape that remained on the thigh for 72 hours. Functional performance and CK level were measured at 48 hours and 72 hours post fatigue. Main Outcome Measures: Independent variables were changes in time (Pre-Immediate, Pre-48hr and Pre-72hr), and group (KT, Placebo, Control). Dependent variables were HopD, CMJ height and CK. For each DV, repeated-measures ANOVA was utilized ($\alpha=0.05$). Results: For CK, there was a significant

difference among Groups ($P=0.04$). Post-hoc comparison revealed that, regardless of time, KT group had lower CK compared to the pre-fatigue value, than Placebo or Control groups (KT-Placebo $P=0.037$; KT-Control $P=0.027$). For HopD, there was a significant effect of Time ($P=0.017$). For CMJ, no Group or Time difference or interaction was significant. Conclusions: Performance was not affected by taping conditions. The CK level change across time seemed to be lower in KT group compared to other groups. KT application appeared to keep CK level near pre-fatigue value more effectively than placebo or control. This result should be interpreted cautiously due to large standard deviations.

U.64 Racial Microaggressions as Experienced by Asian American Females

Carol Vang
Advisor: Linda Dickmeyer, Communication Studies

The purpose of this study is to explore how Asian American females experience racial microaggressions. Racial microaggressions are verbal and nonverbal forms of racism that are less obvious, or more covert than other forms of racist behaviors. "Race experts believe that racism has become invisible, subtle, and more indirect, operating below the level of conscious awareness and continuing to oppress in unseen ways" (Sue, 2010, p. 8). While overt acts of racism are shunned in our society, racism that is indirect and subtle are often reported by people of color. It is vital for this research to specifically explore Asian American females since research has shown that Asian Americans experience racism differently than other people of color (Sue, Bucceri, Lin, Nadal, and Torino, 2009). For example, when compared to African Americans, Asians are viewed as "less American," or as an alien in their own country (Sue, 2010). Asian stereotypes involve academic success and achievement, resulting in a false assumption that they do not experience racism. This perception greatly influences the way other racial groups communicate race to Asian Americans. The current research not only explores the phenomena of microaggressions, but it also gives critical voice to the personal and unique experiences of Asian American females.

U.65 Testing Bone Adaptations to Running and Jumping with Subject-Specific Correlation of Forces and Stresses in the Lower Leg and Foot

Taryn Ashley and Hannah Lawinger
Co-Author: Eric Snively
Advisor: Eric Snively, Biology

Background: Bone responds to exercise and injury by local growth where stresses are concentrated. By combining forces from force-plate studies with stress analysis of an individual's bones, we can investigate how forces affect bones when running, jumping, and walking. We used force data from our activities and models of our own bones to test 1) whether the tibia or fibula (lower leg bones) is under greater force and stress during these activities, and 2) if high stresses occur in regions that have experienced stress fractures. Hypothesis: 1) The tibia will experience more force and stress compared to the fibula, because the tibia is loaded more and therefore its greater area is overcome by more force. 2) There will be greater stresses on the bones that have experienced stress fractures than on adjacent bones. Methods: / Force and pressure plates: The subjects tested running and jumping on force plates. Fifty markers were placed on the subjects' bodies to identify certain positions. Eight trials were performed on each foot for each activity, at a constant speed during the running tests. The subjects jumped over an elevated cross-bar and maintained positioning on the force plate. To better localize forces, one subject walked over a pressure plate. Stresses: We constructed finite element (stress and strain) models from the female Visible Human CT scans (NIH), and modified them with caliper measurements of our own bones. These models, forces, and pressures were combined for finite element analysis in Strand7. Mean bone stresses were compared for each activity. Results and Conclusions: The average stress and force throughout the step cycle was greater in the tibia than in the fibula, and bones that experienced stress fractures did have greater stresses, validating our original hypotheses. These analyses proved useful for investigating both regular exercise activities and injuries.

U.66 Obsessively Opacifying Obsidian: Adapting Three Dimensional Laser Scanning Techniques

Christopher Swoger
Advisor: Katherine Grillo, Archaeology

Three dimensional (3D) imaging technologies are being increasingly utilized by archaeologists to improve the accuracy of material analysis. To facilitate the development of these technologies, it is crucial to determine the limits of different devices and materials. This project focused on the challenge of scanning obsidian blades with the Next Engine HD 3D Laser Scanner, a popular and inexpensive choice among researchers. The Next Engine device was used to scan six small obsidian blades from several Late Holocene sites in northern Kenya. In order to probe the limits of the technology when confronted with dark and reflective surfaces, several simple non-permanent surface treatments and scan techniques were tested on the obsidian blades including the application of an opacifying powder, a coating of cornstarch, and the use of the multidrive object stand. Results are compared with images created using standard lithic illustration methods, photography, and 3D photogrammetry to determine their usefulness in analysis.

U.67 Nutrient Utilization of Streptomyces in Myrick Marsh

Emilee DeSmet
Advisor: Anita Baines, Biology

Myrick Marsh is home to a diverse collection of microorganisms including Streptomyces. Streptomyces are widely found in soil and sediment, and are important to the scientific community because they are the number one producer of antibiotics. This project characterized the carbon utilization of Streptomyces isolated from Myrick Marsh. The samples that were used were collected from five locations in Myrick Marsh with different land use inputs. In order to determine the carbon utilization profiles of these isolates Biolog plates were used. These plates contain 95 different carbon sources so numerous tests could be run at a single time. I have compared carbon utilization of 10 isolates randomly selected from each of the five land use. This project will contribute to the characterization of these Streptomyces communities and may serve as an overall indicator of the health of the marsh.

U.68 Reformation of Native American Trade Beads into Larger Pendants

Sarah Schultz
Advisor: Heather Walder, Archaeology; Brad Nichols, Art

Prior to European contact Native Americans had no glassworking technology. The introduction of new materials like glass beads became very important in Native American culture. Archaeologists have found evidence of Native Americans melting down the glass and fusing fragments of the small glass beads together to create large decorative glass pendants. It is unclear whether Native Americans learned these skills from European traders, or were rediscovered independently. This research uses a multidisciplinary experimental approach to understand the process of pendant construction. Working with archaeologists and glassworkers, this question is put to the test using modern day glass and an enameling kiln. The results of these reconstructive experiments were compared to what has been found in the archaeological record and historic European glassworking techniques. This research not only gives insight into the process of native glass production, but also demonstrates the importance of multidisciplinary research in the sciences.

U.69 Foreign Accents: The Effect of Stereotypic Content on Credibility

Sarah Jaech and Salina Wiltinger
Advisor: Suthakaran Verrasamy, Psychology

The current trend within educational institutions is to emphasize diversity by recruiting international students and foreign born faculty (Stanley, 2006). However, their efforts have been hampered due to the lack of research on how foreign accents interact with topic choice to influence credibility ratings within the educational domain. Research on foreign accents has established that accents influence speaker credibility and negative stereotypes play a role in this perception (Gill, 1994). The current study explores how credibility ratings differ when a foreign accented speaker is speaking about a topic that is stereotypically associated with their accent and a topic that is not stereotypically associated with that accent. We

hypothesize that foreign accented speakers will be perceived as more credible when discussing a topic that is stereotypically associated with their accent, compared to a topic that is not stereotypically associated with their accent. Results indicated an insignificant relationship between accent, content, and credibility ratings. These results may be due to insufficient stereotype activation (Muller & Rothermund, 2014). Therefore, a second follow-up study addressing limitations of the primary study is currently being conducted. This study will provide participants with an informational prime about the speaker to increase stereotype activation. Data collection is underway and we look forward to discovering significant results and insightful conclusions.

U.70 Warp Drive Space-times in the Weak Field Limit

Aaron Vesey
Advisor: Mary Krizan, Philosophy

Einstein's seminal 1916 manuscript "The Foundation of the General Theory of Relativity" constitutes one of the two pillars of modern physics, envisioning a curved space-time manifold which prescribes free fall trajectories, and an equivalence between gravitation and acceleration. As typically conducted by General Relativity physicists, Practitioners of the theory first specify a stress-energy tensor, a rigorous mathematical description of a local matter-energy distribution and its dynamics; the stress-energy tensor serves as the basis for the Einstein Field Equations which, when solved, precisely describe the resulting space-time curvature. In 1994, Miguel Alcubierre reversed this methodology and first described a space-time curvature independent of the stress-energy tensor. He related a space-time geometry which, though it violated several energy conditions endemic to General Relativity physics, appeared to exhibit superluminal (i.e. faster than light) characteristics. We first survey existing literature concerning the physics of warp drive space-times, including a brief historical retrospective and a summary of drawbacks. We then propose a modification to the Alcubierre space-time in order to circumvent these energy condition violations, approximating the geometry in the weak field limit as Fourier and Fourier-Bessel Series compositions of gravitational wave solutions. The weak field warp drive space-time is then analyzed for its physical properties, with a discussion of implications for General Relativity research and the actual engineering of warp drive space-times.

U.71 Computer Models Indicate that Large Carnivorous Dinosaurs in the Same Environment Attacked Different Prey

Erin Wick and Ryan Sokup
Co-Author: Peter Roth and Eric Snively
Advisor: Eric Snively, Biology

Background: The large carnivorous dinosaurs, Yangchuanosaurus and Sinraptor, lived together in the same environment during the late Jurassic period in China. We can investigate which prey these dinosaurs might have hunted by calculating their agility, based on their rotational inertia and muscle force. Hypothesis: The smaller Yangchuanosaurus was more agile than the larger Sinraptor because it had larger muscles relative to its rotational inertia. Methods: Dr. Snively measured widths, lengths, and heights of segments of the dinosaurs' bodies, from descriptions of them and technical drawings of their skeletons. To model the dinosaurs, the measurements were transferred into the computer aided design program, FreeCAD. The models were made using ellipses on an x-y coordinate plane and positioned along a z-axis representing the animals' length. The space between ellipses was then lofted, giving the model a three-dimensional appearance. From the models, rotational inertias were calculated and the leg muscle force was estimated based on the area of attachment to the ilium. Then an agility index for the dinosaurs was calculated by dividing the muscular force by the rotational inertia. Results and Conclusions: The models demonstrated Yangchuanosaurus had a greater agility than the contemporary predator, Sinraptor. The area of the ilium was larger compared to the body's rotational inertia, indicating that the smaller Yangchuanosaurus could turn quicker. This difference suggests that Sinraptor preyed after giant long-necked dinosaurs, compared to Yangchuanosaurus, which preyed on juvenile long-neck dinosaurs and adult armoured stegosaurus.

U.72 Chlamydomonas and the Search for Secretion's Missing Plant Genes

Brynn Sundberg
Co-Author: Anton Sanderfoot
Advisor: Anton Sanderfoot, Biology

The shared ancestry of all cellular life would indicate shared genetic machinery amongst all cellular organisms. This is not the case, however, for the secretory systems of plants and their animal and fungal relatives. Comparing genomes, it has been discovered that land plants are missing essential genes in the secretory process, a system involved in everything from cell wall construction to pathogen defense. This project aims to perform mutagenesis, a genetic screen and to identify the genes through sequencing. As an ancestor to all land plants, the unicellular plant *Chlamydomonas reinhardtii* is a model organism for this project. This gained understanding of secretion can be applied to the indispensable plants of our agricultural industry.

U.73 Placebo Study of Heart-Rate Variability Biofeedback for an Acute Stressor

August Viegut
Co-Authors: Madeline Churches, Brooklyn Sullivan, and Olivia Feagles
Advisor: Ryan McKelley, Psychology

Heart-rate variability (HRV) biofeedback has been used successfully in clinical settings to treat a range of client concerns (e.g., anxiety, chronic pain), but no studies to date have subjected it to placebo study to isolate the active component(s) of the intervention. This study used a single-blind placebo design comparing parasympathetic nervous system activation (e.g., respiration rate and volume, blood volume pulse/heart-rate variability, skin conductance, and cortisol levels) across several relaxation conditions. Participants were randomly assigned to one of four intervention conditions: (1) relaxation breathing only, (2) true biofeedback, (3) sham biofeedback with positive performance, and (4) sham biofeedback with negative performance. Sham biofeedback conditions employed the use of recorded videos with positive and negative performance. It is hypothesized that autonomic nervous system recovery will not differ between relaxation breathing only, true biofeedback, and sham positive biofeedback. However, participants in the sham negative biofeedback will continue to show a stress response due to frustration in failing the relaxation task. Lastly, we anticipate that participants in the true HRV and sham positive conditions will rate the intervention more positively than those in the relaxation breathing only and sham negative conditions. Results should help inform clinicians about the potential use of placebo expectations of biofeedback as a useful component of treatment.

U.74 Using Charcoal to Reconstruct Sedimentation History of the Upper Mississippi River

Tim Wilda
Advisor: Colin Belby, Geography and Earth Science

European-American settlement and agricultural practices beginning ca. 1850 and the construction of the upper Mississippi River (UMR) lock and dam system in 1937 vastly changed the rate of sediment delivery to floodplain lakes of the UMR. Increased rates of sediment delivery to floodplain backwaters harms aquatic habitat and is a threat to aquatic diversity in the UMR. Sediment cores collected from floodplain lakes can be used to determine long-term variability in sedimentation rates. Analyses of charcoal preserved in lake sediment have been used as a method to measure variability and frequency in fire events, but we demonstrate that charcoal analysis can also be used as a dating tool. In this study, samples were taken down the length of a sediment core from Lawrence Lake, a UMR Pool 8 backwater, and analyzed by recording the amount and type (grass vs. non-grass) of charcoal contained in each sample. Charcoal results were compared with existing core data, including pollen, organic matter content, magnetic susceptibility, and zooplankton abundance. While the charcoal analysis did not show conclusive evidence of local fire events or periods with increased fire frequency, charcoal abundance did indicate a pronounced increase in sedimentation beginning ca. 1850 at 110 cm below the modern lake bed. Before European-American settlement, sedimentation rates were low (approximately 0.02 cm/yr), but post-settlement backwater sedimentation rates increased to 0.69 cm/yr. Charcoal analyses have the potential to be used as a quick and cost-effective method for dating anthropomorphic changes to landscapes in the upper Mississippi River basin.

U.75 Ecological Stoichiometry of *Bithynia tentaculata* in the Upper Mississippi River

Alexandra Clussman
Co-Author: Gregory Sandland
Advisor: Roger Haro, Biology; Gregory Sandland, Biology

Bithynia tentaculata, a snail native to Europe, was introduced into the Great Lakes in the 1880s and was first recorded in the Upper Mississippi River (UMR) in 2002. This invasive aquatic snail harbors multiple trematode parasites that have been implicated in waterfowl mortality in the region. Unfortunately, little is known about these snail-parasite interactions. Herbivorous gastropods, like *B. tentaculata*, play a major role in the uptake, transformation, and recycling of biologically important elements (e.g. carbon, nitrogen, and phosphorus). Resources can be highly variable in an environment, yet, many snail species can maintain homeostasis by differentially excreting nutrients that are in excess relative to demand. Previous research on other systems has revealed that infected snails excrete a higher N:P content than uninfected snails, suggesting that infected snails modulate nutrients differently. However, the role that trematodes play in altering the nutrient dynamics in *B. tentaculata* is unknown. Our objectives are to use stoichiometry to determine 1) how parasite infection affects nutrient uptake and retention by *B. tentaculata* and 2) if there are differences in the elemental composition of tissues found in field-collected and lab-reared snails. Snails have been reared in the lab and exposed to parasite larvae. The elemental composition (molar C:N:P) of snail tissues (somatic and reproductive) and excreta will be measured for both infected and uninfected snails. We hypothesize that infected *B. tentaculata* excreta will have a higher N:P ratio than that of uninfected snails. Also, we predict that there will be differences in the elemental composition of tissues between infected and uninfected *B. tentaculata*. Lastly, we hypothesize that lab-reared snails will have a different elemental body composition than field-collected snails.

U.76 The Development of ZnO Based Electro-Absorption Modulators

Miranda Elkins
Advisor: Eric Gansen, Physics

Today, there is interest in using ZnO for optoelectronic devices. ZnO exhibits a bandgap in the ultraviolet (UV) spectral region making it well-suited for short-wave optoelectronics such as electro-absorption modulators (EAMs). EAMs are devices where the amount of light transmitted is controlled electrically. This allows digital and analog information to be encoded on a light beam which can be used for optical communication or data storage purposes. EAMs constructed from semiconductor multiple-quantum-well (MQW) structures consist of alternating layers of two materials with different bandgaps and typically utilize the quantum-confined Stark effect (QCSE). The QCSE is where the absorption of a MQW is modified by applying a voltage across the layers causing an increase in their bandgap energies (known as a Stark shift). The largest absorption change occurs for light tuned near the bandgap energy of the wells (smaller bandgap layers), linking the operating wavelength to the material system. While current research on EAMs has focused on developing devices that operate in the infrared spectral region, there is a growing demand for EAMs that operate in the blue and UV (short-wave) spectral region. Numerous properties of ZnO push it to the forefront of promising materials to be used for short-wave EAMs. ZnO is non-toxic and relatively inexpensive in comparison to GaN systems being investigated for short-wave optoelectronics. ZnO has a wide band gap and can be combined with alternating layers of ZnMgO to form type-I MQW structures. The QCSE has been observed in such MQWs; however, those structures were grown epitaxially which is not ideal for large-scale commercial production. Here, I will discuss my research on the optical properties of ZnO/ZnMgO MQWs grown using a dual-source reactive DC sputter deposition system. I will present how these optical properties of the ZnO/ZnMgO MQW structures impact their suitability for use as short-wave EAMs.

U.77 Patterns of Inhibitory Activity of *Streptomyces* from Myrick Marsh Sediments

Kevin Krause
Advisor: Anita Baines, Biology

Given the extensive benefits freshwater marshes provide for their inhabitants, as well as for surrounding human populations, it is critical to understand the relative health of these ecosystems. To comprehend the health of freshwater marshes, like Myrick Marsh in La Crosse, WI, sediment dwelling bacterial communities

can be employed as bioindicators because they are unable to escape pollution and have short generation times and are, therefore, highly responsive to conditional variability. In this study, fifty strains of *Streptomyces* isolated from sediment samples at an undisturbed control site and locations that are directly inundated with storm water runoff from several land use areas (commercial/industrial, commercial/residential, transportation, and residential) were examined for their inhibitory capabilities of ten non-indigenous reference *Streptomyces* isolates (previously obtained from agricultural fields) by performing inhibition assays. Assay analysis on the marsh isolate inhibition of non-indigenous reference isolates indicated average zone of inhibition size was slightly higher at the control site than the commercial/industrial location and isolates from the transportation site demonstrated markedly less inhibitory capabilities relative to the other locations. Given that inhibition of other microbes through production of antibiotics is a primary competitive tactic used by *Streptomyces*, any lessened inhibitory capability could indicate reduced health of the system. Furthermore, as each drainage site was characterized by a different drainage regime these assays can potentially yield data on the varying hazard levels each land usage poses. Comparisons with reference isolates indicated that isolates from the transportation site were potentially more severely impacted than isolates from other sites in their broad inhibitory abilities.

U.78 Collection and Initial Description of Mississippi River Backwater Sediment Cores

Jordan Keller
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Analysis of river and lake sediment cores has been extensively used to develop records of past climate and environmental changes. Lawrence Lake, a backwater lake of the Mississippi River, offers a rich sediment profile that can provide insight into the natural history of the area near La Crosse WI. The purpose of this research was to 1) extend the existing Lawrence Lake record back about 2000 years, and 2) assign ages to the sediment core using radiocarbon dating. In January 2015, a 252 cm sediment core was collected from Lawrence Lake using a combination of Bolivia and Livingston piston corers. Cores were transported to the Limnological Research Center Lac Core Facility at the University of Minnesota, where an Initial Core Description was performed. The sediment core underwent various analyses, including magnetic susceptibility, density, color spectrophotometry, acoustic wave velocity, and electrical resistivity. These data will be presented, and preliminary findings will be discussed, which should reveal sediment characteristics that represent a footprint of past environmental events. Additionally, dating of the core is underway, and organic matter has been separated from the sediment matrix at various levels in the core. These samples will be radiocarbon dated and will be used to assign ages to the sediment core, allowing for the examination of the effects of events such as human settlement and lock and dam construction on the riverine environment.

U.79 Methylmercury in Terrestrial and Aquatic Bio-Indicators at Voyageurs National Park, MN

Anne Tronnes and Alex Ritchay
Advisors: Kristofer Rolfhus, Chemistry and Biochemistry; Robin Tyser, Biology

Methylmercury (MeHg) is a neurotoxin that readily accumulates in aquatic and terrestrial food webs to concentrations that may pose risk to both wildlife and humans. While most research on MeHg has been conducted in aquatic ecosystems, relatively little is known about its impact on terrestrial wildlife in near-shore zones. The majority of MeHg is synthesized from inorganic mercury in shallow sediments of aquatic habitats by methylating bacteria, and potentially transferred to near-shore birds through feeding on hatching insects. To investigate the transfer of MeHg between aquatic and terrestrial systems, we hypothesized that the MeHg content of the newly-hatched eggs of near-shore red-winged blackbirds (*Agelaius phoeniceus*) would correlate with MeHg in dragonfly larvae (a common aquatic bio-indicator, but not a direct food item for red-winged blackbirds) and unfiltered water from 5 sites within Voyageurs National Park, Minnesota in April-July of 2012 and 2013. Means of MeHg concentration in blackbird eggs, dragonfly larvae, and unfiltered water were 66-211 ng/g (dry weight), 40-93 ng/g, and 0.06-0.16 ng/L, respectively. Means of blackbird egg MeHg concentration were not significantly correlated with mean MeHg in adjacent water bodies, or with MeHg in dragonfly larvae. An interesting trend of increasing songbird egg MeHg concentration with hatching time through the spring period was observed, suggesting that newly-available MeHg was indeed making its way to eggs through dietary pathways. While there is likely substantial transfer of MeHg from aquatic to terrestrial habitats each spring, our results suggest that the linkages between these two bio-indicators are weak due to the lack of a direct dietary relationship.

U.81 Embracing the Whole Spectrum: An Investigation of Females with Tetrachromacy

Lowell Thompson
Advisor: Alex O'Brien, Psychology

The explanation for the experience of color perception is an unresolved and controversial topic. Is your red my blue? Although this question remains unanswered, the mechanisms responsible for color vision have been highly studied. Individuals with normal color vision have three types of photoreceptors called cones, which are responsible for the ability to perceive color. However, there exists a small group of females theorized to experience superior color perception due to the inheritance of an additional cone from their fathers, making them tetrachromats (four cone types). It is unclear if these individuals have the proper neural connections to exhibit behavioral differences in color discrimination. A recent color perception test (Jodran & Mollon, 2010) has shown the potential to reveal these differences. Researchers identified one of their eighteen participants to have enhanced discrimination abilities. The present study further investigates the color discrimination abilities of possible tetrachromats by using a similar testing method to Jordan and Mollon (2010). Understanding the cause(s) of these differences, if they exist, may allow for a better understanding of how humans as a whole perceive color. Participants will run through multiple trials using randomly selected pairs of colored squares, taken from a computer-reproducible spectrum, and will be asked to identify if the stimuli are identical or different. Tetrachromatic participants are hypothesized to have superior discrimination abilities in some areas of the color spectrum compared to normal trichromatic participants.

U.82 Change in Helical Conformation Caused Only by the Difference in the Charge Placement on Model Antibiotic Peptides

Jayna Sharma and Riley Larson
Co-Authors: Olivier Lequin, Lucie Khemtouri, Ludovic Carlier, Kevin Larson, Theodore Savage
Advisor: Adrienne Loh, Chemistry and Biochemistry

The effect of antibiotics is slowly declining as the species of bacteria are evolving, which increases the need to find or make new antibiotics. One promising possibility is peptide antibiotics, which are commonly helical and positively charged. Currently we are working with peptides made mostly of the "greasy" (non-polar) amino acid Aib (α -aminoisobutyric acid), which imparts a strong 310-helical bias due to steric hindrance at the α -carbon. Lysine residues (which are positively charged) are placed right next to each other (at positions 4 and 5: peptide "KK45"), or one turn apart from each other (at position 3 and 6: peptide "KK36"). Some previous studies have reported that the placement of less hindered amino acids in Aib-rich peptides can impact helical shape, but the effects of charge placement is still unknown. Our goal is to identify how the structures of the two peptides are similar or different, and how the structures are affected by solvent environment. We are examining three different solvents: DMSO (strongly hydrogen-bonding), TFE (helix stabilizing) and water. To do so we are using NMR, which allows us to see the complete titration of amide proton chemical shifts for KK36 and KK45 from aqueous (90:10 H₂O/D₂O) solution to DMSO-d₆ or TFE in order to identify the residues that are undergoing local environment changes as the bulk environment is changed. We are also using circular dichroism (CD) spectroscopy to determine the global (not atom-by-atom, but overall) structure of the peptides as a function of temperature in the same three solutions. Our results thus far indicate that KK36 undergoes more structural change as the solvent is changed, while KK45 (which was predicted to be less stable) is more insensitive to solvent but adopts a kinked helical structure. Ultimately the correlation of structure and sequence will inform future antibiotic peptide design.

U.83 University Faculty's Ideas on the Role of Evolution in Biology

Alex Olson, Jessica Knudson, and Kristin Mehr
Co-Author: Megan Litster
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It is generally acknowledged by the scientific community that the understanding of evolutionary principles is a critical concept in the understanding and application of biological principles (Nadelson, 2009). Dobzhansky even went so far as to state "Nothing in biology makes sense, except in the light of evolution" (Dobzhansky, 1973). This powerful statement resonates with many a biologist and science educators when attempting to clarify the key ideas of biology. Most often evolutionary concepts are packed into one or a few chapters in a

general biology textbook with minimal coverage throughout the course of a student's degree program, and then taught as one big course at the culmination of that program (Nehm et al., 2008). This study attempts to explore students' conceptions of evolution as an organizing theme in biology through a qualitative lens. Evolution Across the Curriculum (EAC) is designed to introduce evolutionary concepts throughout a student's program with vignettes or case studies highlighting how evolution is important in every area of biology. In addition, these curricular changes are designed to address potential alternative conceptions students have of evolution, and attempt to overcome their reticence to learning about biological evolution. Evolution across the curriculum was introduced by the UWL biology department in the Fall of 2012. Our project was designed to complement an ongoing quantitative study designed to discover students in depth conceptions of evolution as compared to the faculty that are teaching them. The initial population we interviewed was be the set of faculty involved in the design of the EAC program. We hope to answer two key questions: 1. How does the implementation of an EAC impact students' ideas on the central importance of evolution to understanding biology? 2. Does students' understanding of evolution reflect the intended ideas of the teachers/designers of an evolution across the curriculum? We would like to present preliminary research comparing faculty's ideas of the role evolution plays in biology and what they think regarding the EAC project.

U.84 Bike Accessibility in La Crosse, WI

Dylan Hamel

Advisor: Gargi Chaudhuri, Geography and Earth Science

Biking is an efficient, environmentally friendly, cheap and healthy way to travel, so it is one of the most popular and common modes of transportation among students and faculty for a major part of the year. The objective of this research is two fold, first the present status of bike accessibility within the city of La Crosse will be reviewed, and second, it will analyze the future potential for improvement. Primary research will be conducted using geospatial data and tools in ArcGIS and Excel along with knowledge gained from existing literature on the bike friendly cities in US, and online survey with the focus group of UW-L. Socio-demographic and origin-destination survey data paired with road connectivity will show the true value and assessment of La Crosse's bike accessibility. The outcomes of this study are expected to provide a fresh spatial perspective on use of bikes as a popular mode of alternative transportation. The results will be disseminated via journal publication and oral presentation at a national conference. The final products along with the research paper will hopefully also be shared with the city planning officials, local bicycle association, and local scholars.

U.85 Killing Capabilities of SK-03-92 Persisters Compared to Parent Strains

Elissa Harter

Advisor: William Schwan, Microbiology

Methicillin-resistant *Staphylococcus aureus* (MRSA) infections are an ongoing health threat in healthcare facilities and to the general public. One major challenge in treating these infections is finding effective antibacterial drugs against the new emerging antibacterial resistant strains. Previously, a new drug named SK-03-92 that shows antibacterial killing activity against MRSA was identified. The way the *S. aureus* bacteria respond to this drug can reveal how the drug works. Certain MRSA bacterial cells can survive in the presence of high concentrations of SK-03-92 drug without an inheritable mutation in the genome; they are called SK-02-92 drug persisters. This study investigates the differences between the killing capabilities of the parent strain of these drug persisters in comparison to the drug persisters themselves by analyzing the growth curve, abscess formation in mice, and pur gene regulation of each strain. The drug SK-03-92 has potential for future human use and could save thousands of lives annually. Therefore, it is important to understand and learn about the characteristics of these drug persister bacteria.

U.86 An Analysis of Local Versus Non-Local Ceramics from the Early Period of Roman Colonization at the Site of Trier

Emily Eklund

Advisor: David Anderson, Sociology/Archaeology

Established by Emperor Augustus circa 15 B.C. as Augusta Treverorum, the site of Trier in Germany was one of the most important cities in the Roman Empire. The city was home to multiple emperors, but its

indigenous peoples also had a history of rebelling against the empire, creating a checkered relationship between the local indigenous peoples and the ruling Romans. This poster examines the early interactions between the Roman Empire and the Treveri tribe, the indigenous peoples of the area. The research analyzes the local and non-local ceramics from the early period of Roman colonization that have been found at the site and uses statistics to consider the possibility of interaction and trade between the Treveri and Romans and the extent to which this may have led to cultural diffusion. Understanding the possible degree of interaction between the two groups cannot only enable us to begin to better understand the effects of Roman colonization, but also colonization in general, which has played such an important role in our world history.

U.87 Health Differences between New Zealand, Australia, and United States Elementary Schools

Lexie Adams and Tierney Wittmann
Advisor: Keely Rees, Community Health Education

The purpose of this study is to determine the different health and wellness programs that elementary schools in New Zealand, Australia, and United States have implemented to try to promote physical activity and nutrition to the students. Each participant went through a similar interview process that asked roughly 27 qualitative questions that was best suitable for that participant's knowledge. The participants were recorded, voluntarily, during the 30 minute interview to allow the researchers to efficiently gather data. Most of the elementary schools observed were so diverse from each other and had various health and nutrition programs that it was hard to compare and contrast what schools were doing a better job in each country. However, since there was such a variety of programs implemented it could provide some insight and help to other schools who are in need of promoting health to their students. By reading this study, recommendations could be made at struggling elementary schools to implement interventions to reduce nutrition and health program barriers.

U.88 Continuities of Religious Belief in Viking Age Scandinavia: An Analysis of Burials in Gotland, Sweden

Victoria Sorensen
Advisor: David Anderson, Sociology/Archaeology

Religious and burial studies in Scandinavia tend to heavily favor a checklist style approach to analysis, determining whether a grave was Pagan or Christian. I argue that religious conversion in Viking Period Gotland can be seen not as a flip from one religion to another, as it is commonly understood, but rather as a continuity of underlying belief which molded itself to the dominating religion of the time. This continuity was fueled by the flexibility of belief in reaction to new ideas and can be seen in the grave goods of the cemetery of Barshalder on Gotland, Sweden. Through comparative analysis of graves from the Vendel, Migration, and Late Viking Periods, it becomes increasingly obvious that Viking peoples were retaining their formerly established set of beliefs and modifying them to fit the dominant Christian religion.

U.90 Intrinsic vs. Extrinsic: A Qualitative Study of Factors Influencing Motivation

Kathryn Harrsch and Brandon Landowski
Co-Author: Tesia Marshik
Advisor: Tesia Marshik, Psychology

The purpose of this research was to explore which aspects in an academic setting affect student motivation. Previous research shows that grades are extrinsically motivating to students and take precedence over other intrinsic motivators (Kohn, 2011). Mastery and performance goals provide evidence for why students either have high or low effort when completing learning tasks (Ames, 1992). Upon entering college, students are more motivated to learn the material, but as they continue, they become more focused on obtaining a higher grade and doing the least amount of work to achieve it. This research has suggested a reversal effect of motivation; that is, those who became focused on performance can revert to being more learning-motivated if there are specific structural changes to the classroom including the amount of professor interaction (Kowalski, 2007). Data was collected through interviews with 72 students from a small, Midwestern University in which set questions relating to academic motivation were asked of each participant. Interviews were transcribed in order to effectively identify common themes in the student responses. The themes influencing student motivation included: grade importance, student emphasis of motivational changes due to

fluctuating grades; major-related course importance, high motivation in major-related courses and low motivation in non-major-related courses (e.g. general education courses); professor engagement, student accent towards more passionate instructors and interpersonal relationships; and course requirements, students' motivational changes in classes that required more independent readings, daily assignments, and mandatory attendance. The results of this study show that student motivation is situational and can be influenced by professor-student interactions. This study can be used by professors to influence student motivation based on the trends that were established from the student responses. The findings may be useful to both novice and senior professors who are interested in advancing student motivation through modifying their methods of teaching.

U.91 Who's Your Daddy? The Occurrence of Multiple Paternity in Photos *Annecohenae*

Emma Weibel and Amanda Smith
Advisor: Gretchen Gerrish, Biology

Females having multiple male mates is a mechanism of reproduction observed in a variety of species. This unique type of mating is usually present when males intensely compete for female reproductive partners. In the bioluminescent marine ostracod, *Photeros annecohenae*, it is known that the operational sex ratio (number of males vs. females actively pursuing mates) is highly skewed (250 males: 1 female), but it is unknown whether or not females are copulating with multiple males and producing broods of offspring that have multiple fathers. The hypothesis for this study is that *P. annecohenae* will have offspring in a single brood that are fathered by multiple males. In order to test this we will use extracted DNA from 10 mothers and all offspring from each mother. Specific microsatellite regions will be amplified through PCR. These repetitive regions of the DNA will be used to determine whether the offspring within a brood are conceived by one or multiple fathers. When these goals are accomplished we will be able to shed light on a previously unknown part in the life history of *P. annecohenae*.

U.92 Attitudes, Behaviors, Motives, and Settings Related to Drinking: A Cross-Cultural Analysis

Timothy Lomeli
Advisor: Alessandro Quartiroli, Psychology

In the past years, college-aged individuals' binge-drinking has become more of a focus of study on US college campus (NIH, 2013). According to the WHO, 9.6% of the American adult population (7% males; 2.6% females) will become alcohol dependent in their lifetime, whereas 2.9% of the French adult population (4.7% of males and 1.3% of females) do not. This difference has been supported by previous research in French college-aged individuals, who report engaging in significantly less frequent and less severe drinking than American young-adults (Dantzer, Wardle, Fuller, Pampalona, Steptoe, 2006). Comparing the difference in attitudes, social norms, and perceived behavioral control (PBC) from these two populations could illustrate a better understanding of attitudes and motivations to drink. Using the Theory of Planned Behavior (TPB) as a theoretical framework to look at the information collected (attitudes, norms, and PBC) from the French and American populations could highlight differences. These differences could explain the disparity in alcohol usage among the French and American populations, and why French adults do not become alcohol dependent. Using that data could lead to a better approach to understanding alcohol use, and thus to develop a better alcohol education program. The results of this study will be reported.

U.93 The Communication of Romantic Partners Experiencing Unemployment

Bailey Benedict
Advisor: Jennifer Butler Modaff, Communication Studies

With the unemployment rate around six percent, job loss is a prominent concern in the United States. However, these numbers underrepresent the far-reaching issue of unemployment and all the people it touches, including millions of romantic partners and family members. Studying how the upheaval and insecurity of unemployment impacts romantic partners and their communication is an essential part of understanding the unemployed experience and its full effect on families. The purpose of this qualitative study is to explore the communication of romantic couples during periods of unemployment. The subject population for this study includes individuals involved in a romantic relationship where one partner is (or has been in the last five years) unemployed. After conducting interviews, the transcriptions will be thematically analyzed to

uncover emerging patterns about interpersonal communication and how couples communicatively support each other. Using Coordinated Management of Meaning theory as a framework, the research will examine how romantic partners ascribe meaning to their interactions and how unemployment impacts their communication and relationship dynamics. For the sake of sustaining romantic relationships and families, communication during unemployment is addressed.

U.94 Followers: Effect of Sleep Deprived Honey Bees' Waggle Dances on the Behaviors of Dance Followers

Keaton Unrein

Co-Authors: Michael Vogt, Jessica Kallas, and Sam Schneider

Advisor: Barrett Klein, Biology

Sleep greatly impacts organisms' lives, yet is a behavior that is full of many mysteries. How sleep has evolved given the very vulnerable position it puts sleeping organisms in, is of major interest to the scientific community. In the European Honey Bee (*Apis mellifera*), sleep has been shown to influence the precision of a dance that individual bees in the nest use to direct others bees of the nest to a food source. Bees that had been sleep-deprived were shown to have dances that were less precise (Klein et al. 2015). A remaining variable to explore in this beehive environment is the effect that these sleep-deprived bees' dances have in communicating the advertised location of food to nestmates. How does the sleep deprivation and imprecision of the dances affect the ways in which bees that follow the dances react? Can follower bees sense when a dancer is sleep deprived? Using videos of bees that had been sleep deprived and others with a normal amount of sleep, the behaviors of the follower bees were analyzed. Dancing bees were followed along their dancing circuit and the followers of these bees, recorded. These followers were then observed and their behaviors logged. These data were then analyzed to determine the differences in the followers' behaviors due to a lack of sleep in the dancing bees. This behavior has great importance in the survival of the hive given the need for the resources of the food source. If follower bees are unable to find this source due to incorrect directions given, the ability for the hive to obtain this resource is greatly restricted. Thus, there lies great importance in these followers ability to discern sleep-deprived dancers as to not waste time and energy on dances that may be unreliable in directing towards the food source.

U.95 Body Image Perception in Adolescent Males

Rena Elwood

Co-Authors: Jamie Erickson, Ryan Kacvinsky, and Erik Krueger

Advisor: Karen Skemp, Exercise and Sports Science

Until the mid 1990's, most research concerning body image focused on females, and eating disorders such as Anorexia (AN) and Bulimia Nervosa (BN). Recently, a newly identified disorder called Muscle Dysmorphia (MD) has emerged within the male population that is marked by a disruption in body image with extreme body dissatisfaction and a drive for muscularity that leads to compulsive behaviors to attain an ideal body shape. Participants of this study consisted of adolescent males in grade 6 through 12, in a Midwestern school district. The goal was to identify if there was a specific age group and/or sport's participation that made individuals at risk for Muscle Dysmorphia. The participants took both the Muscle Dysmorphia Index (MDI) Questionnaire and the Eating Attitudes Survey (EAS) to determine a level of dissatisfaction and unhealthy behaviors within age categories and among athletes/non-athletes. Consistent with the hypothesis, results revealed and deepened the understanding of the timing/ onset and demographic specific to MD. Athletes and upper classmen show higher occurrences of body dissatisfaction and unhealthy behaviors on the scales of clinical symptomology within eating disorders and Muscle Dysmorphia.

U.96 Antiviral Effects of Highbush Cranberry Extracts

Shanna Mueller and Julianne Merkes

Co-Authors: Alison Foglia, Michael Hoffman, Michael Waxman, James Lane

Advisor: Michael Hoffman, Microbiology

Viburnum trilobum, also known as the highbush cranberry (HBC) is a shrub native to Wisconsin. In the past, native tribes used these plants for medicinal purposes, leading some to believe that they may have antiviral effects. To test this hypothesis, two viruses, human parainfluenza virus type 3, an enveloped virus, and

poliovirus (Sabin type 1), a non-enveloped virus, were exposed to HBC extracts and then monitored for inactivation. More specifically, a recombinant HPIV-3 encoding a luciferase gene was exposed to extracts of varying concentrations, and then used to infect cells. The level of virus inactivation was monitored by measuring luciferase expression from surviving virus. We showed that inactivation was dose dependent and that a dose of 0.1 mg/mL of one sub-fraction reduced luciferase activity by 95%. In another inactivation assay (a plaque assay) a 1 mg/mL concentration of one HBC extract resulted in an approximately 10,000-fold reduction of poliovirus and a 100-fold reduction of HPIV-3. These assays showed highbush cranberry extracts could be a natural antiviral product.

U.97 Thirteen-lined Ground Squirrel Hibernation Effects on the Enteric Nervous System

Kathryn Thompson
Advisor: Sumei Liu, Biology

Background: The enteric nervous system is the intrinsic nervous system within the gut that controls gastrointestinal motility, ion secretion, and local blood flow. During hibernation, gastrointestinal motility is slowed down. The present study aims to investigate the changes in the enteric nervous system that may contribute to the lowered level of gastrointestinal motility. Method: Five summer active, five winter torpor, and five interbout arousal thirteen-lined ground squirrels were used in the study. Immunofluorescence staining was used to examine the changes in neurochemical codes in the enteric nervous system of the ground squirrel colon. Cell counts were carried out to examine possible changes in the numbers of cell bodies immunoreactive to HuC/D, a pan neuronal marker; choline acetyltransferase (ChAT), an enzyme for acetylcholine synthesis; and nitric oxide synthesis (NOS), an enzyme for producing nitric oxide, in the enteric nervous system of the colon. Results: There was no significant quantitative change in the total number of neurons in the myenteric and submucosal plexuses of ground squirrel colon during winter torpor and interbout arousal. In the summer active group, there were 24.02 ± 2.24 neurons/myenteric ganglion and 15.10 ± 0.54 neurons/submucosal ganglion. In the winter torpor group, there were 22.87 ± 2.45 neurons/myenteric ganglion ($P > 0.05$, $n = 5$) and 17.81 ± 1.57 neurons/submucosal ganglion ($P > 0.05$, $n = 5$). In the interbout arousal group, there were 23.03 ± 2.09 neurons/myenteric ganglion ($P > 0.05$, $n = 5$) and 14.79 ± 0.97 neurons/submucosal ganglion ($P > 0.05$, $n = 5$). We also observed ChAT, a marker for cholinergic neurons. There was a significant decrease in the number of ChAT-immunoreactive (IR) neurons in the myenteric plexus of winter torpor ground squirrels. In the summer active group, there were 14.17 ± 1.45 ChAT-IR neurons/myenteric ganglion and 9.98 ± 1.00 ChAT-IR neurons/submucosal ganglion. In the winter torpor group, there were 8.48 ± 1.14 ChAT-IR neurons/myenteric ganglion ($P < 0.05$, $n = 5$) and 10.35 ± 1.53 ChAT-IR neurons/submucosal ganglion ($P > 0.05$, $n = 5$). In the interbout arousal group, there were 11.38 ± 1.44 ChAT-IR neurons/myenteric ganglion ($P > 0.05$, $n = 5$) and 8.70 ± 0.45 ChAT-IR neurons/submucosal ganglion ($P > 0.05$, $n = 5$). We also observed NOS, an enzyme which catalyzes the synthesis of the inhibitory neurotransmitter nitric oxide. There was no significant difference in expression of NOS between summer active, winter torpor, and interbout arousal ground squirrels. Conclusion: Selective downregulation of ChAT in the myenteric plexus of the ground squirrel colon may contribute to gut hypomotility during winter torpor.

U.98 Exploring the Process of Choosing French as a Major

Amanda De Cora
Advisor: Christine Bakkum, Student Affairs Administration

French as a major has been suffering declining numbers for many years. This research attempts to examine how current French majors chose their field of study. Using an ethnographic approach, a general picture of whom and what influences a students' choice in majoring/minoring in French may appear. Topics of interest are parents, career aspirations, expected career opportunities, and high school teachers' and counselors' input. Further, gathering demographic information and an inventory of experiences may reveal a basic profile of prospective French majors. Such issues as club/organization membership, travel history, and parents' college major/minor may give French faculty a clearer picture of their majors. Common experiences or backgrounds may be found that make choosing French as a major more likely. The information gathered in the process of this study may be able to help address the reason for diminishing numbers in the academic study of the French language.

U.99 Would you have Coffee with a Bi-Guy – The Influence of Gender- Role Expression and Sexual Orientation on Likeability

Tanya Kontowicz
Co-Author: Cassandra Lund
Advisor: Betsy Morgan, Psychology

Previous research on interpersonal relations suggests that likability can be based on trait similarity or role complementarity. However, there is limited research regarding how gender-roles influence likability in the context of friendships between individuals of different sexual orientations. Six hundred and eight participants were randomly assigned to one of twelve conditions and read a scenario about individual where the gender-roles and sexual orientations were manipulated. The individual in the scenario was either described as gay, lesbian, bisexual (female), or bisexual (male) and with feminine, masculine, or androgynous traits. Feminine individuals regardless of sexual orientation were more likeable than androgynous individuals and masculine individuals. In addition, there was an interaction between gender of the participant and gender-role of the character.

UNDERGRADUATE ORAL PRESENTATION ABSTRACTS

UR.1 Chew on This: Self-control, Eating, and Mindfulness

Eric Barreau
Advisor: Tesia Marshik, Psychology

The proportion of people who are overweight or obese has reached pandemic levels. In 2013, the American Heart Association reported that 23.9 million children and 154.7 million adults were overweight or obese (Go et al., 2013). One factor highly relevant to this problem is self-control, which is the ability to regulate our actions in pursuit of goals and to bring them in line with various standards (Baumeister, Vohs, & Tice, 2007). Individuals low in self-control may be more likely to overeat. Mindfulness meditation is an intervention shown to restore depleted self-control (Frieese, Messner, & Schaffner, 2012). Furthermore, mindful eating is another promising means to combat overweight and obesity. Mindful eating is a non-judgmental awareness of physical and emotional experiences that arise when eating (Framson et al., 2009). The purpose of the present study was to examine the effectiveness of a brief mindfulness meditation intervention in restoring participants' self-control and increasing mindful eating behaviors. This study consisted of a 2 (self-control depletion or no self-control depletion) x 2 (mindfulness meditation intervention or distractor task) experimental design. First, participants' completed an emotion suppression task, with those in the self-control depletion condition instructed to suppress their emotions, and those in the no self-control depletion condition instructed to allow their emotions to arise naturally. Next, participants in the mindfulness meditation intervention listened to a guided meditation audio clip, while those in the distractor task condition completed a series of connect-the-dot figures. Finally, all participants were placed in a waiting room scenario where candy was available, after which their self-reported mindful eating was assessed, as well as the amount of candy consumed. It was hypothesized that participants whose self-control was not depleted and those who received the mindfulness meditation intervention would eat less and report being more mindful while eating during the waiting room scenario.

UR.2 Presence of 'Love Languages' in Intimate Relationships across Generations

Cassandra Philippon
Advisor: Dawn Norris, Sociology

As long as love has been around, we've been trying to define, explain, and measure the experience. Previous research has categorized this subjective experience of love and developed scales to operationalize love behaviors and expressions (Watts and Stenner 2005; Lemieux 1996; Goff et al. 2007). This has led to several studies examining the use of primary love expressions between partners and satisfaction in relationships (Chapman 1992; Lemieux 1996; Goff et al. 2007). Little research has looked at the discrepancies between the type of primary love expression between different generations or cohorts (Goff et al. 2007). The current study seeks to examine the use of primary love expression in romantic relationships across generations using an anonymous online survey completed by 76 undergraduate students, staff, and faculty at a midsized, Midwestern university. Participants span across three different generations, including Millennial, Generation X, and Baby Boomer generations. The current study compares data across these cohorts. Respondents rated the behaviors to identify (1) their preferred love expression, (2) the love expression type they received from their partner, and (3) their satisfaction in the relationship. I hypothesize that when a partner expresses their love to us using expressions we prefer, we are likely to feel the most loved. I expect to find differences between the preferred love language across generations, as well as the self-reported satisfaction across generations. The current study seeks to examine if a congruence between received and preferred love languages correlate with relationship satisfaction. Furthermore, it examines this congruence across generations. Findings from Higgins (1987) suggest that a discrepancy between received and preferred love languages may result in dissatisfaction and disappointment in a relationship., and past research (Large and Marcussen 2000; Marcussen 2006) suggests that these love language discrepancies may have physiological and psychological repercussions.

UR.3 A Comparative Analysis of Small Scale Medio and Post-Paquime Lithic Assemblages in Casas Grandes, Chihuahua, Mexico

Thatcher Rogers

Advisor: Jessi Halligan, Sociology/Archaeology

The archaeological record of northwestern Mexico directly prior to the arrival of the Spanish is poorly understood. Investigations at sites have historically been limited and infrequently published on. In particular, examinations of small scale settlements have not occurred. The time period between AD 1450-1550 in northwestern Chihuahua is often characterized by major and sudden settlement abandonment, although there have been few archaeological investigations to support this claim. As part of my research, I collected both quantitative and qualitative data from lithic assemblages recovered from multiple sites excavated in 2013-2014 located in northern Chihuahua, Mexico and dating between AD 1350-1650 to examine changes that occurred during this period. Through statistical comparisons between the different assemblages, I was able to discern trends in site use over time. The greatest difference is representative of a change in the frequency of agave processing and raw material use. The implications of this study are that it is one of the first investigations into this period of time in the region and provides evidence for site-level changes from the pre-Spanish into the Spanish Contact period. Additionally, this study provides an example for how archaeological investigations can be used to explore the broader anthropological topic of culture contact between European and indigenous peoples.

UR.4 Fitting In: An Examination of American Study Abroad Students' Nonverbal Expectancy Violations during Their Time Abroad

Hannah Olevson

Advisor: Tony Docan-Morgan, Communication Studies

Studying abroad is a pivotal experience for many college students. It can provide them with a broader global perspective, but demands a cultural awareness that some students may lack. Although students may prepare to study abroad by learning a new language, they may shortchange the importance of nonverbal messages they send. This study reports on the nonverbal behavior and nonverbal expectancy violations between American study abroad students in Spain, France, and Hungary. One hundred and seven study abroad students and 20 natives in these host countries participated in an in-depth questionnaire. The results of this project have theoretical implications for the study of nonverbal and intercultural communication, and practical implications for students planning to study or travel abroad.

UR.5 A Re-evaluation of Oneota Cultural Phases in the La Crosse Locality

Mackenzie Miller

Advisor: Constance Arzigian, Sociology/Archaeology

The Oneota culture has been well dated in La Crosse Wisconsin to between AD 1300-1625 (Boszhardt 1994). Single component sites have also allowed for definition of specific ceramic types and attributes as diagnostic of each of three phases. Previous excavations and analysis of materials recovered from the Tremaine site (47-LC-95) revealed pottery and radiocarbon dates correlating to all three of the phases (O'Gorman 1995). During the summers of 2011 to 2014, new excavations have taken place at the site allowing for more evidence to be collected. Rim shards from these excavations show attributes that are intermediate between those of the last two phases, the Pammel Creek and Valley View phases. This has led to a need for refined criteria for each of the phases and, perhaps, an additional transitional phase. The two specific measurements indicating this, rim notching and rim height, were either not looked at from the original excavations or looked at in a very limited fashion. Due to this, original potsherds have been premeasured for more refined data. The original 42 dates and the two new dates will be recalibrated as well as have Bayesian analysis performed on them to help redefine the three Oneota phases.

UR.6 From Brothels to the Classroom: the Sex Appeal of the Tango in “Take the Lead”

Erin Maletzke
Advisor: Rose Brougham, Modern Languages

The tango was born in and around the brothels of Buenos Aires just before the turn of the twentieth century. Enticement and allure were key weapons in the arsenal of tango dancers, who used this social dance to tell the story of the marginalized in the capital city. More recently, Liz Friedlander directed the Hollywood film, “Take the Lead” in which a dance instructor, in a low-income school, teaches marginalized students ballroom dancing and the art of the tango. This research paper examines the parallels between the origins of the earliest tangos and the dances in the 2006 movie “Take the Lead”, looking particularly at the role passion and sex appeal played in increasing the tango’s popularity. To explore the role the tango and its shady origins played in appealing to the students in the movie, this research project analyzes sources concerning the history of the tango in modern Buenos Aires and its relationship with prostitution, sexism, and classism. As a genre born out of social protest, the first tango dancers and the students both used the tango to express complicated relationships and emotions in a way not entirely approved of by high society. The rigid class segregation between the elite and the poor in early twentieth century Buenos Aires is mirrored by separation of the students from competing schools in “Take the Lead”. The poor, antiauthoritarian, hyper-masculine *compadritos*, or semi-urban *gauchos*, provide the basis for the male characters in the movie. All of these underlying similarities work together to produce a complex plot involving class struggles, relationships, stereotypes, rebellion that play out in the tango. Although the characters in the film do not learn of the dance’s origin more than a century before, they react to and identify with the core attitudes, movements, and stories the dance communicates, and the social aspects of the dance offer them opportunities to mature and express their unique identity.

UR.7 "Bandoneon:" Creating Parallels between Music and Life

Jessica Gonzalez
Advisor: Rose Brougham, Modern Languages

The tango, an Argentine dance and genre of music has enjoyed much success in the ballrooms of Argentina and around the globe. Beyond the musical and dance components, tango appears in other forms of art, like poetry. The Uruguayan poet, Mario Benedetti, wrote “Bandoneon” in which he invites readers to experience the tango through the bandoneon, the iconic instrument of the tango. In the analysis of this poem I argue that Benedetti uses the bandoneon as a metaphor for life itself. This study centers on the sociological, lexical, emotive, and physicality of the instrument as a parallel for existence. As a cultural product of the poor, immigrant, suburban Buenos Aires in the the early 20th century, the tango depicts and defines experiences and emotions that have been suppressed by centralized power forces. Benedetti captures the spirit of this marginalized life, recreating both its high and low points. These oppositional elements appear in the text’s structure as they do with the accordion form and movement of the musical instrument. In addition to the emotional and physical movement of the bandoneon and life, Benedetti also makes word choices that recreate the musical experience that parallel real-life emotions. Finally, the metaphor allows us as readers to understand the connection between life and art, and invites us to find these links in our own lives. Simply put, we need to step back and take time to look deeper into things we might take for granted, and celebrate its impact on our life.

UR.8 The Sociolinguistic Reflection of the Evolution of Tango's Public Image

Henry Meger
Advisor: Rose Brougham, Modern Languages

Throughout tango’s history, its public images and interpretations have evolved along with its music. The evolution of said images and interpretations can be noted in various scopes of everything that is tango; one of these scopes is the note-worthy and often overlooked sociolinguistic one, which remains pertinent in today’s world as it has a continuous effect on the national self-identity of the Argentine people. / / The growing sociocultural acceptance of tango in a context as Argentine as worldwide between the last few decades of the twentieth century and the start of the twenty first century is present in a parallel diffusion of language. Lunfardo, Cocoliche, the language of the *gauchos*, and the use of the modern Argentine pronoun *vos* along with its respective conjugations, among other grammatical, lexical, and phonetic traits, are present

in Argentine literature, modern day-to-day dialectal language, and tango itself. The development of these changes are embodied in the phonetic-phonological transcriptions of the singings of the three presented recordings of Enrique Cadícamo's tango "Che Bartolo." Carlos Gardel's recording from 1928, Tita Mermello's from 1969, and Rita Cortese's from 2008. A distinctly and newly consolidated Argentine dialect of Spanish rooting in Lunfardo, Cocoliche, and the language of the gauchos gave at the start of the twentieth century, and continue to give today, the Argentine people a more distinct and solidary cultural and national identity. The grammatical and lexical evolution of what has become known today as commonplace Argentine Spanish, even as linguistic norms in some cases, are present in the bodies of literature presented such as Entiaslao del Campo's poetry from the late 1800s, Carlos de la Púa's poetry from the early 1900s, and the dramas and short stories of Julio Traversa and Fray Mocho from the early 1900s. / / The explosive boom of the popularity and acceptance of tango between the Guardia Vieja and the Guardia Nueva frequently resulted, as it continues to today, with a nostalgic yearning to regain what used to be tango of the Guardia Vieja before its worldwide discovery among the European upper social classes, notably that of Paris. As tango between the Guardia Vieja and the Guardia Nueva, so did the argot associated with it, and in turn the social connotation of such language. Understanding the nature and roots of the language of tango is vital in achieving a competent sense of the national identity of the Argentine people and how this self-identity inherently relates to and originates in this language.

UR.9 An International World, Lacking an International Language

Rebecca Schnabel
Advisor: Kelly Sultzbach, English

Elie Wiesel's *Night* demonstrates the manipulation of translation as a method of inspiring specific reader responses, and revealing the Marxist theory of how ideas are shaped in our society by those in control of material production. Translators must consider the original meaning of a text as a whole, as well as the desired meaning upon delivery. These desired responses could be inspired by a variety of reasons, including but not limited to gaining personal power and monetary reward. Elie Wiesel's memoir is a work that reveals a significant controversy behind translation, and our abilities as a globalized community to communicate personal experiences across cultural constraints. The world is not an open discussion, but instead a mediated and manipulated script, that is controlled through those who have the means to produce and choose what the rest of us have the option to be deceived by. This is especially relevant when discussing personal accounts of genocide and mass murder. How does one on the other side of the globe discover the true devastation committed across the world, when the most pure knowledge about it is being corrupted by the translators production and distribution of it? Translation toes the narrow line between cross cultural enlightenment, and global mass deception. Language is a source of power, and those who shape our international dialect hold control over the common consumers, manipulating readers' responses for political and economic gains. How can we trust the information handed to us by our government, by foreign governments, by news reporters and journalists, if even the victims themselves such as Elie Wiesel, cannot produce and distribute mass translation without permission and support by those in economic power. People blindly trust firsthand accounts as undeniable truths, without even considering the potential corruption of the memoirs through publication and linguistic translation.

UR.10 The Comparative Study of the Academic Effectiveness of Milwaukee College Preparatory School (MCPS) and Milwaukee Public Schools (MPS)

Stephanie Holt
Advisor: Ray Block, Political Science

Education, a popularly agreeable unalienable right within the United States is at stake , specifically within Milwaukee, WI. Milwaukee Public Schools (MPS) in 2013 had a graduation rate of 62.8%, a failure of which MPS schools are held accountable. What can be done to improve academic results? The current philosophy, lead by Wisconsin governor Scott Walker, is to invest public funding in charter schools. The purpose of this study is to deduce whether the public investments in charter schools were warranted. Through the assessment of the Wisconsin Knowledge and Concepts Examination (WKCE), MPS and MCPS grades 3rd – 8th current year test scores and compound test score growth will be compared to identify academic effectiveness.

UR.11 Who Are You in Wonderland?

April Wildes
Advisor: Kelly Sultzbach, English

Lewis Carroll's *Alice in Wonderland* is a prominent text to study when analyzing the issues of identity. Carroll, alter ego of Charles Dodgson, creates a world of illogicalness while Dodgson's actual life was stable and cautious. Connecting his instability in his writing to his logical career as a mathematician, the case of identity is questioned due to shifting attributes that satirically correlate to Victorian society as you fall deeper down the rabbit hole into a world as far from reality as you can get. The only stable constant throughout his novel, *Alice's Adventures in Wonderland*, is instability. Alice is the epitome of a character with identity issues due to constantly shifting size and how she feels she has changed several times since falling down the rabbit hole. Wonderland is a symbol of the illogical and counteracts the stability of reality. This then points to another question about Wonderland, does Wonderland represent a world outside of reality that is meant for the uncertainty or does each of us have our own type of Wonderland within us that we must come to face because identity is a topic each of us has to confront. This then finally leads us into the ever demanding question that Wonderland holds, "who are you?"

UR.12 Physical Decline, Age Identity and Social Interaction in the Elderly Population

Lisa Stoughton
Advisor: Dawn Norris, Sociology

The percentage of elderly people in the population is increasing, and the outlook for healthcare jobs is thriving because of it. As a hopeful healthcare worker of this population, it is one of my career goals to help the aging population stay healthier for longer. Several scholarly articles support that age identity plays a big role in the psychosocial well being of the elderly. I will interview participants ages 65 and older to discover how physical disability affects age self-perception (age identity), how physical disability affects social integration, and how age identity affects social integration. I am expecting to find that social treatment from others after experiencing physical decline is going to affect age identity and that negative age identity will decrease social motivation and/or ability. Understanding this aspect of aging can help future healthcare workers to impact the lives of this population for the better. I plan for this study to give them a perspective as to how to help shape their future career so that they can make a difference in as many lives as they can.

UR.13 [art]ifact: The Planning Stage of an Innovative Exhibit

Ariel Reker
Advisor: Ariel Beaujot, History

In 2013 I presented a proposal for an exhibit in my public history class. It was so well received by my peers, professor and the community members present that I decided to bring it to fruition. Over the next year I applied for an Undergraduate Research and Creativity Grant, created a team of students to work with on the project and found a professor who would mentor the group. This year I began to meet with the two community partners to evaluate the project and see if it is feasible, we wrote a Call to Artists, commissioned a website, began to apply for local and national grants, and expanded awareness about the project statewide. We are now certain that [art]ifact is feasible and of interest to our community. We have established roles for the group I am the Public Relations officer and co-director, Callie O'Connor is the Curator, Calli Niemi is the Diversity and education coordinator, and Dr. Ariel Beaujot is the Co-Director. We have also added to our mission an education component: we will reach out to local schools as well as historically underrepresented community members. I will present about how to create an innovative exhibit, how to work with multiple community organizations and bridge the town and gown divide, and I will speak to the importance of hands on research and public history development in an undergraduate setting. This is an opportunity that will change the trajectory of my career and has been invaluable.

UR.14 Communicating Study Abroad Encounters

Noelle Griffiths

Advisor: Dena Huisman, Communication Studies

Studying abroad has become increasingly popular within undergraduate education. According to The Institute of International Education, the number of U.S. students studying abroad for academic credit during the 2002-2003 school year was about 174,000 students. By the 2012-2013 academic year, the number of U.S. study abroad students had significantly risen, reaching a record high of 289,000 students. Those 289,000 students did not include the additional 15,000 who went abroad for internships and volunteer work. As studying abroad's popularity grows, so does its significance in society and the job market. Obst, Bhandari, & Witherell (2007) argued, "U.S. students and their parents increasingly recognize the value of studying abroad in order to be prepared for leadership roles in the global economy and an increasingly interconnected world. Studying abroad gives students a career skill set that is increasingly valued by its employers" (p.7). Previous research has focused heavily on the qualities students develop while abroad, the design of study abroad programs (SAPs), and culture shock students experience after returning home. While those establishments are valuable, they do not capture how communication while abroad continues to impact communication back in the U.S. This study explores the role of global mindfulness in communication during SAPs and on the transition home, including how communication abroad impacts student outlook on diversity. Ultimately, the project explores college students' communication with similar and diverse others while studying abroad and the effects of that communication on global mindfulness as they transition back to the U.S.

UR.15 The Relationship of the Campus, the Community, and Environmental Movements in La Crosse

Jennifer DeRocher and Corrine Rabay

Advisor: James Longhurst, History

The University of Wisconsin-La Crosse campus has actively had its voice heard through demonstrations since the 1960s, when the Civil Rights Movement and Vietnam War roused college students across the nation to protest. During the Vietnam War, UW-L students were very active in protests. They had campus rallies, invited war veterans to speak, and organized teach-ins to inform more people about what was wrong with the war. By 1970, the community of La Crosse was tired of college demonstrations that disturbed the peace in the town. However, in the 1970s the community of La Crosse joined UW-L students to push the city to be greener and more ecologically appreciative. On campus, there began a drive for environmental movements: Earth Day was first celebrated in 1970, recycling came a few years later, the marsh was threatened by construction, and the coal-burning smokestack on campus was questioned. These movements directly made UW-L a more sustainable campus, and influenced the city of La Crosse to make their own environmental footsteps. My research looks at what specific ways this shift can be seen and asks if the success of the demonstrations can be connected to who was involved. To find the answers, I have studied primary documents like newspaper articles from the 1960s through present day, a pamphlet from the first Earth Day, and correspondence records between UW-System authorities and government officials, all of which piece this story together. This is an important part of La Crosse history. Today, there are still constant fights to save the marsh and by working together, the community and campus have the best results—a relationship that formed during the 1970s movements and has stuck together since. The past relationship can also inspire a stronger one in the environmental movements to come.

UR.16 Art and Yoga in Perspective: Applications of Historical Techniques in Contemporary Practices

Allecia Kruser

Advisor: Jennifer Terpstra, Art

While in an art history course, I became intrigued by traditional Indian miniature paintings and woodblock printed textiles. With further research, I found a residency in India that offers instruction in these arts from local artists. By travelling to India, I will be learning these ageold practices first hand. I will also be staying at a yoga ashram to supplement my art. I will learn what it means to live a yogic lifestyle by practicing meditation, chanting, and asanas (postures) and use this as a basis for my future career in art therapy. This

undergraduate research project will enable me to research the production and aesthetic value of miniature paintings and woodblock printed textiles as well as holistic practices that support the development of various art forms. Engaging in both art and yoga studies in India will enrich my knowledge base as an art educator and also serve as a foundation as I move forward with my art therapy schooling. Upon completion of my research in India I will hold two workshops offering my findings to members of the community.

UR.17 Language as Cognition: Truth as Subjective

Danielle Watterson
Advisor: Mary Krizan, Philosophy

Language is, perhaps, one of the most advancing phenomena, in the true sense of the word, to be devised and domesticated in human history: it has granted us a communal medium through which our private ideas can be understood by others as each word we utter is a manifestation of the ideas we have tied to it. Within the sphere of philosophical discourse, since its infancy, skill in rhetoric and persuasion could not be valued more. Although it is, definitively, the love of wisdom, philosophy is not only driven to acquire knowledge and discern truth, but is also keen to make such truths accessible to others. According to Aristotle, rhetoric is "...the faculty of observing in any given case the available means of persuasion," therefore making it a powerful means of altering another's ideas; ergo, if we only know in the way of ideas, then the ability to warp, modify, and create ideas in the mind of another through persuasion is to have power over what they know to be true, and, consequently, their reality. Through the scope of philosophy, this essay will be an interdisciplinary look into the psychology of language, and the cognitive effects of rhetoric. The following analysis will examine the nature of rhetoric and how the speaker employs it through the works of Aristotle and Lanham; the relationship of the speaker and the audience as depicted by J. L. Austin; the role of our ideas and the cognitive features of language via Locke and Davidson; and, finally, my evaluation of its effects and implications in the acquisition of truth.

UR.18 Culture Clash and Racism: How the 1980s Spearfishing Conflict Impacted Lakeland Union High School

Dakota Elliot
Advisor: Patricia Stovey, History

In the 1980s Wisconsin communities were battling over Native American treaty rights. The treaties, which had been reaffirmed in 1983, allowed Ojibwe Native Americans to hunt, fish, and gather on their ceded lands outside of their reservations. It caused an uproar with neighboring non-Native communities who were not permitted to do the same. The Lac du Flambeau Ojibwe people and residents in nearby Minocqua and other towns fought over the treaty rights, in some cases, by violently protesting at boat landings during spearfishing season. Spearfishing revealed racism between Natives and non-Natives in Northern Wisconsin and put students at Lakeland Union High School right in the middle of it. / The small northwoods town of Minocqua, Wisconsin is home to Lakeland Union High School (LUHS). As the name implies, the school is a union made up of four different grade schools throughout the area, one of which is Lac du Flambeau Grade School. Lac du Flambeau (LDF) is a town located on the Lac du Flambeau Indian Reservation, only miles from Minocqua and LUHS. As a 2010 graduate from LUHS, I grew up hearing about the school's problems and I saw the racial conflicts first hand. My research is focused on the high school's racial environment in the late 1980s. It demonstrates that the high school students were not immune from the racism happening among the communities of Minocqua and LDF. The spearfishing conflict made racial tension worse within the high school because students were exposed to the racial tensions among adults. Although much has been written regarding the economic, cultural, and racial impact of the spearfishing conflict, no one has analyzed how the racism impacted high school students. Through oral interviews with former Native and non-Native students and teachers, research in newspaper articles about the conflict and school environment, and extensive secondary reading, I found that the conflict created a hostile environment for Native American students at LUHS.

UR.19 Architecture as Craft Specialization: An Examination of Changes in Style at the Archaeological Site of Paquimé, Chihuahua, Mexico

Thatcher Rogers

Advisor: Jessi Halligan, Sociology/Archaeology

The archaeological site of Paquimé in Chihuahua, Mexico was occupied between AD 1150-1475 and represents a sociopolitical complex polity unique within the Southwest. Paquimé is known for displaying stylistic elements of both Classic Mesoamerican and Southwestern cultures. Recent investigations have attempted to understand the role of Paquimé in the region by exploring social interactions with small sites nearby, the development of the site itself, and the presence of Paquiméan iconography found hundreds of miles away. Yet poorly understood is what happened at Paquimé in the late fifteenth and early sixteenth centuries. By treating elements of domestic architecture as a form of craft specialization, changes in architecture can be used a proxy to discern political and social transformations leading up to the site's abandonment. Findings presented are placed in context of cultural reorganization that characterizes the late prehispanic Southwest and the broader anthropological interest of examining societal collapse.

UR.20 Being, Love, and Our Raison d'Étre: Exploring Sartre and Modern Sexuality

Danielle Watterson

Advisor: Mary Krizan, Philosophy

Sartre's *Being and Nothingness* (an investigation into the consciousness of being) asserts that, because man is initially devoid of a predestined essence, it is necessary for us to ascertain our being from nothingness. We paint our identity starting from a blank canvas, with the colors we choose as the choices we make; however, it is not until we meet the gaze of another that we truly discover ourselves. Whether it be a provider of care and nutrients, a teacher of morals and wisdom, or a giver of love and affection, the attention and company of others is undeniably crucial to our being. Concerning loving relationships, however, we are often given contradicting advice: some say to remain independent while in union with another, others maintain complete submission to our "other half," and we are often misled as to the relationship between sex and love. Our romantic relationships that are committed, intimate and passionate are different though; there is something special to be said about having that special someone. The great importance Sartre places on the nature of our relationships with others and how we discover ourselves through them intriguingly parallels modern theories of human sexuality, such as those purported by Sternberg and Lee, and it is the goal of this essay to illustrate the commonalities within this juxtaposition and to interpret the implications it inspires.

UR.21 The History Hunt

Julia Roden

Advisor: Ariel Beaujot, History

The History Hunt was a historical scavenger hunt that promoted the La Crosse Public Library Archives (LPLA). I chose a scavenger hunt as my medium to educate the public about La Crosse, Wisconsin history because it is both entertaining and educational. Not only are scavenger hunts entertaining but they provided the community with multiple benefits. Mike Doyle, Marilyn M. Helms and Nancy Westrup's article, "A Fast Track to Cultural Immersion: The Scavenger Hunt," classifies scavenger hunts as experiential learning. Experiential learning is popular because it typically results in greater satisfaction, higher realism, and an improved transferability of learning to the workplace. / The central research question for History Hunt was to see if people were more likely to visit the LPLA or any archives after having participated in an event that focused on archival material. The methodology I used was a short four-question survey immediately after the hunt, and a follow-up email survey with a further five questions and additional space for further comments. In this way we received qualitative and quantitative feedback. My hypothesis was that people who have fun, through events like the History Hunt, while engaging in archival research would be more likely to use the archives later. The data collected revealed this to be true: on a scale of 1-10 (10 being the most likely) the average score for whether or not participants would do another scavenger hunt was a 9.4. The likelihood of people utilizing the LPLA rated was at 7.9/10, and the likelihood of people using any archives was rated at 7.7/10. The archives has agreed to collect data over the next year (until October 2015). We, both the archivist and myself, deem this project a success having 35% of the participants using the archives for non-scavenger hunt related work.

UR.22 Identity Development in Northern Thailand: Hmong Thai Experiences as a Marginalized Group

Mai Zoua Vang
Advisor: Vincent Her, Anthropology

This research, based on a three-week undergraduate study abroad trip, provides a basis for understanding the experiences of Hmong Thai as ethnic minorities in Thailand. Their identity and sense of belonging are not only influenced by race, ethnicity, and lack of opportunities to participate in national life, but also by everyday struggles to cope with prejudice and discrimination. Given the rigidly hierarchical nature of Thai identities, how do Hmong Thai perceive themselves in relationship to lowland Thai? Do they consider themselves to be full citizens with the same rights and privileges enjoyed by the majority group? Twenty six individuals living in northern Thailand were interviewed. Several themes emerged in the ongoing struggles of Hmong people living as a marginalized group in modern Thai society.

UR.23 The Beauty of Possibility: Logic and Time Travel

Danielle Watterson
Advisor: Mary Krizan, Philosophy

A person trying to comprehend a four-dimensional spacetime is like a dot trying to comprehend a two-dimensional line: the dot is 1-dimensional and cannot fully understand a whole line comprised of individual points because that requires another dimension of extension. The dot is attempting to perceive a multitude of dots in a medium only designed to accommodate one at a time. Similarly, in Kiekeben's work "Three Time Travel Problems," we are led to believe that time travel is logically impossible due to the following premises: 1) If someone travels to the past, they may succeed in changing it, and 2) If the past is changed, then an event at a particular location and time both did and did not occur. Perhaps this discrepancy, however, is due to our (as in the whole of man's) constructed idea of what time is fundamentally, and not due to the reality of time's nature. We experience time as a sequence of individual moments, indeed as a movement, but, unlike movement, we only experience time in one direction- rendering time travel impossible. Time is not to be thought of as how we typically measure it though, as those are merely constructed increments. Our knowledge of the universe is based upon our relative experience to it; we experience an insanely small portion of the physical universe in increments of moments, so we must accept that our understanding of it follows suit. Through classic works of Science Fiction such as *The Twilight Zone*, *Back to the Future*, and *Doctor Who*, this problem purported by metaphysics will be evaluated, and maybe eliminated, allowing for the logical possibility of time travel.

UR.24 At Risk as Disrespect: The Experience of Black Male Youth in Wisconsin

Natalie Kellerman
Advisor: Peter Marina, Sociology

Recent news regarding the use of authority and power over the African American community has sparked passionate debate in both public and private spheres, especially in the cases of Eric Gardner in New York and Michael Brown in Ferguson, Missouri. This study aims to understand the power of labels when applied to young black men within our society. This qualitative research involved a collection of interviews with young black men between the ages of 18 and 30 who have been assigned negative labels in the past, such as "at risk" youth. The result of this study shows how these men understand and respond to such labels. For example, not only did these men realize and understand their marginalized position within society, but they also in turn conformed their style of dress, speech patterns, and overall identity to "code switch" when navigating middle class spaces such as school. This study goes beyond previous research done on the power of labels in connection with African American men to offer a unique insight into how these men develop an extreme sense of awareness and hyper-reflexivity to respond to systems of racism and inequality.

UR.25 Road to Hell

Lily Cornwell

Advisor: Walter Elder, Theatre Arts

The psychological thriller has been a budding popular genre since Hitchcock's Psycho in 1960 awed audiences with an innovative insight into the psychological motivations behind fictional killer Norman Bates. The proposed short film will highlight both insight into a killer's mind and an unfamiliar approach to the psychological thriller genre, using assistance from UWL psychology professors to clarify complex psychological motivations in order to create accurate depictions of characters in the film. The goal of this project is to use research about the history of this film genre in conjunction with research on personality and psychopathy to construct a short film that creatively encourages personal reflection about the minds of other individuals. My hope is that this exposure to the experiences, thoughts, struggles, and motivations of a psychopathic killer will exercise our ability to empathize with the people around us, thus increasing our ability to understand, accept, and forgive.

UNDERGRADUATE EXHIBIT PRESENTATION ABSTRACTS

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

E.1 Medical Illustrations of Human Anatomy

Logan Keding
Advisor: Kerrie Hoar and Barrett Klein, Biology

Artistic interpretations of the human anatomy were produced over a one month period by UWL undergraduate Logan Keding, implementing various mediums and styles. Keding's work was mentored by UWL Human Anatomy Professor Kerrie Hoar and UWL Scientific Illustrator/Biology Professor Barrett Klein. Research was conducted in Cowley Hall Room 112 using live models and live cadaver dissections (2 female, 3 male)

UNDERGRADUATE EXHIBIT PRESENTATION ABSTRACTS

Valhalla Hall:
11 am-12:45pm

E.3 The Evolution of The Flamenco Dress

Alexandra Filipovich
Advisor: Joe Anderson, Theatre Arts

The Spanish flamenco dress is one of the most famous and recognizable cultural symbols in Spain. The costume consists of a long, tight, figure hugging dress that is adorned with ruffles and frills that sway with the dancer as she performs the flamenco dance. Like the dance, the dress has gone through many changes over the years. From modest beginnings starting out as a dress worn by those of a lower socioeconomic status, it has evolved and changed throughout history. The flamenco dress is as much a part of Spain as an iconic, cultural identifier as is the well loved dance it is tied to. My presentation will help provide an explanation and timeline of how the style of the dress has changed over the years to become the cultural symbol it is today. From seeing flamenco museums in Spain and attending various flamenco shows in different cities in Spain, I have been able to get information about the flamenco dress from many different perspectives. This has provided me with more accurate information of where the dress has come from and how it has evolved throughout time. Along with the timeline of the flamenco dress, I will also be providing an actual example of a flamenco dress, which I have created to capture the most significant of changes throughout the history of the dress.

E.4 Trompe L'oeil Mural to be Installed in La Crosse, WI

Alyssa Shurbert-Hetzel
Advisor: Jennifer Terpstra, Art

What I set out to do: Last year, the city of La Crosse commissioned internationally renowned artist, John Pugh, to paint a public trompe l'oeil mural on the side of the Pump House Regional Arts Center. Trompe l'oeil, meaning "to deceive the eye" is not a popularly known style of painting in the Midwest nor is it taught at UW La Crosse. I was one of three student/local artists along with Shelby Phillips and Robert Minnie, selected by John to fly out to California in January and March of 2014 to learn first-hand the mural painting techniques, styles, learn about public art projects, gain further observational skills, participate in the various stages of murals, installing murals, and networking by meeting new artists and art patrons. Throughout the spring, Shelby and I participated in the first annual Creative Imperatives Week demonstrating several Trompe L'oeil painting techniques and presented our research to faculty, students, administrators, and community members interested in trompe l'oeil murals.

Key Findings and Conclusion: By May of 2014, the mural, which is painted on a "Tyvek"-like material, was flown to La Crosse and with the help of me and the two other interning artists, installed it on the West facing wall of the Pump House. In June, the mural, Confluence, was officially unveiled to the La Crosse community. Shelby, Robert, and I learned valuable painting lessons and skills that we can apply to our own art and have shared with the community. This internship has allowed Shelby and me to create our own mural based off the skills and techniques we learned in this internship.

GRADUATE STUDENT ABSTRACTS

GRADUATE POSTER PRESENTATION ABSTRACTS

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

G.1 Therapeutic Gardening: Creating Happier Lifestyles for Adults with Disabilities

Jennifer Happ

Co-Author: Stephen Lewis

Advisor: Steven Simpson, Recreation Management & Therapeutic Recreation

Research has shown that interacting with nature is not only important for survival but is also extremely important for individuals' overall quality of life and well being (Keniger et. al, 2013). Gardening activities can help connect people with nature, and therapeutic gardening has been proven to have positive effects on individual's physical well-being, psychological well-being, stress levels, and overall general health (Kirk, Karpf, & Carman, 2010). This 11-week research project evaluated the effectiveness of therapeutic gardening activities on 16 adults with disabilities moods through a raised bed salsa garden program. The participants from the day service center took part in pre-garden activities, raised bed gardening, and salsa making from their produce. This study employed both qualitative and quantitative measures collected during the duration of the program. Results showed a relationship between therapeutic gardening and increased positive affect.

G.2 Isolation, Characterization, and Application of Native Fungi from Contaminated Ecosystems for the Bioremediation of Arsenic

Margaret Weitzman

Advisor: Thomas Volk, Biology

Although mankind is rapidly developing important technological and chemical advances, the widespread use of toxic materials in those industries results in their spread to and persistence in global ecosystems. The heavy metal arsenic is a particularly concerning toxin due to its pervasive environmental contamination as well as its severe toxicity. Arsenic is a potent carcinogen and has been associated with numerous other health issues, and negatively impacts ecosystem integrity by harming animals, plants, and microbes alike. Because the toxic element arsenic cannot be broken down or decomposed, the only solution for addressing its contamination in soil and water is to remove it. Existing strategies for heavy metal removal are expensive, labor-intensive, inefficient, and ecologically disruptive; this situation necessitates alternative solutions. A promising research avenue is that of mycoremediation, or the directed application of fungi such as mushrooms and soil molds to combat pollution. Fungi demonstrate a remarkable ability to remove, sequester, and detoxify heavy metals in the surrounding environment, and present preferable remediation methods over conventional ones methods due to their lower cost and ecological impact. In order to provide support for the critical tasks of remediation and ecosystem restoration, this project aims to isolate and identify dozens of fungal strains from local metal-contaminated sites and characterize their tolerance to, and transformation of, arsenic in their environment. Experimentation including culturing of fungi with arsenic, microscopy, and elemental analysis provide insight into the cellular and biochemical mechanisms of arsenic detoxification. Initial results indicate that the fungi are tolerant to extremely high levels of arsenic – in some cases 500,000 times the EPA standard for drinking water – and that they uptake and modify arsenic in various ways. Analysis and synthesis of the final experimental data will shed light upon how these fungal isolates might be used in particular remediation systems at contaminated sites.

G.3 Filter-Feeding Asian Carp and Particle Dynamics in the Mississippi River

Amanda Milde

Co-Authors: Eric Strauss, Bill Richardson, James Larson, Jon Vallazza, and Brent Knights

Advisor: Eric Strauss, Biology

Invasive Asian carp are a major threat to native ecosystems because they can affect native food web structures and out-compete native species for resources, ultimately altering native ecosystem functions and

services. This has led to heightened concerns about their spread throughout the United States and entrance into the Great Lakes. Native to China, Asian carp were brought to the U.S. in the 1970s and 80s for water quality and algae control in aquaculture ponds. Asian carp are voracious filter-feeders consuming phytoplankton and zooplankton however, little is known about their filter-feeding effects on native food webs in newly invaded natural systems. Large rivers, such as the Upper Mississippi River, provide adequate flow, temperatures, and abundant planktonic food resulting in high rates of growth and reproduction. Our objectives were to: (1) determine seasonal changes of water quality and size distribution and composition of suspended particles and plankton in Navigation Pools 19 and 20 across a range of habitat types and carp densities, and (2) characterize the size distribution and composition of particles being ingested by Asian carp to determine variation in prey selection. Water and fish sampling were conducted in spring, summer and fall of 2013 and 2014. Water quality and nutrient analyses were completed according to standard methods using a Lachat auto analyzer. Particle and Asian carp gut content analyses, including phytoplankton and zooplankton, are currently in progress with a FlowCAM microscope and imaging system. Preliminary results suggest that seasonal high flows may have an effect on nutrient and particle availability among habitats and potentially particle food availability for Asian carp. Finally, using spatial patterns of carp distributions we can determine relationships between carp abundance and particle dynamics. This information will be pertinent to researchers and managers for implementing effective control measures for Asian carp and the management of aquatic systems.

G.4 Effects of Fly Ash on Municipal Solid Waste

Daniel Liska
Co-Author: Eric Schuh
Advisor: Bonnie Bratina, Microbiology

The La Crosse County Landfill provides a waste disposal solution for the La Crosse Area. According to Henry Koch, Director of Landfill, they work closely with Wisconsin Department of Natural Resources to ensure the safest handling of municipal solid waste (MSW), hazardous materials, waste-to-energy ashes, and other materials. Bottom ash and fly ash are produced through the burning of MSW by the Xcel energy plant. Xcel has contracts with the Landfill to dispose of the bottom ash with other solid wastes, but fly ashes can be hazardous and are segregated into a single site. This site is expected to run out of disposal space before the contract with Xcel is complete. The Landfill is currently seeking approval from the DNR to apply the extra fly ash to the top of a municipal waste site prior to closing it. However, this will not provide a permanent, economical solution. One possible solution for fly ash disposal would be mixing it directly into the municipal waste site. The biggest concern is that leaching of compounds, like heavy metals, disrupts the water treatment process or microbial degradation. However, Xcel fly ash may not be as volatile as typical fly ashes and could be amenable to mixing with MSW. This thesis project aims to answer questions about the environmental impacts of adding Xcel Energy fly ash to MSW in laboratory landfill simulators.

G.5 Gait Changes with an Exercise Program for Individuals with Neurological Disorders

Jacob Hegge
Co-Author: John Greany
Advisor: John Greany, Physical Therapy

Background: Neurodegenerative disorders affect physical, psychological, and functional status. Exercise programs may be an effective strategy to delay functional decline. Temporal-spatial gait variables such as velocity, stride length, and cadence are ways to document change. Purpose: To evaluate the impact of a 12 week exercise program on temporal-spatial gait parameters in individuals with neurological disorders. Subjects: Temporal-spatial gait data were collected on 48 individuals with neurological disorders (Parkinson's, Multiple Sclerosis, and post-Stroke) with the mean age of 70.3 ± 12.5 years (28 males; 20 females). Methods: The exercise program (60 minutes; 2x/week) consisted of aerobic training, resistive training, and balance activities. Pre- and post-test assessments of temporal-spatial gait variables were obtained from a GaitRite Electronic Walkway mat (NY, USA) at their normal speed. Subjects performed the walking task twice with or without assistive device. Data were collected and averaged for the two trials. Data were analyzed using either a paired t-test or Wilcoxon signed-ranked test with an alpha value of 0.05. Results: Velocity increased from 101.2 ± 28.3 to 105.1 ± 26.4 cm/sec; $p=0.03$. Double support (R and L) decreased from $0.38 \pm .09$ to $0.35 \pm .07$ sec; $p<0.01$. No changes in stride length (R and L) 114.2 ± 22.9 to 118.2 ± 22.7 cm or percent in stance (R and L) 65.3 ± 6.5 to 65.2 ± 3.8 were found. Conclusion: A 12 week

exercise program consisting of aerobic training, resistive training, and balance activities for individuals with neurological disorders resulted in increases in velocity and decreases in double support. Clinical Relevance: An exercise program may be an effective strategy to delay or reverse declining temporal-spatial gait variables in individuals with neurological disorders which may lead to improvements in functional status.

G.6 The Acute Effects of Hawthorn Supplement on Resting Energy Expenditure

Stephanie Dintzner

Co-Authors: JF Greany, D Dolan, J Hegge, Kristin Greany

Advisor: John Greany, Physical Therapy

Background: Hawthorn (*Crataegus laevigata*) is an herbal supplement marketed to promote a healthy circulatory system. The leaves, flowers, and berries contain antioxidant flavonoids which may dilate blood vessels, augment blood flow, and protect blood vessels from free radical damage. Research supports its efficacy in heart failure and potential use in decreasing angina and blood pressure; however, its effect on energy expenditure is unknown. Purpose: The purpose of this study is to determine the acute effects of the dietary supplement Hawthorn on resting energy expenditure. Methods: A convenience sample of 14 apparently healthy subjects (10 females, 4 males) age 25.4 + 8.0 years (mean + SD) completed the study. Following a 12 hour fast and abstinence from caffeine and exercise, resting energy expenditure (REE), resting VO₂ ml/kg/min and respiratory quotient (RQ) were measured with indirect calorimetry using a SensorMedic Vmax (Yorba Linda, CA) ventilated hood system. Following baseline measurement, each subject consumed 900 mg of Hawthorn extract (3, 150 mg capsules standardized for 2% vitexin twice daily) for 7 days and post measurements were obtained. Results: There was a significant increase in REE (1205 + 164 kcal; 1257 + 158, p = 0.01) with a mean increase of 52 + 72 kcal. There was a trend toward an increase in VO₂ (2.5 + 0.3; 2.6 + 0.3 ml/kg/min). There was no change in resting RQ (0.85 + 0.03; 0.86 + 0.03). Conclusion: Acute ingestion of Hawthorn supplement mildly increases resting energy requirements in healthy subjects without known cardiac history. Clinical Significance: In addition to reported heart health benefits, Hawthorn berry may slightly increase resting metabolism with potential for influencing body composition. Future studies are needed to evaluate how this supplement and dosage affects individuals with cardiac disease.

G.7 The Acute Effects of Hawthorn Supplement on Arterial Circulation

Samantha Olson

Co-Authors: Danielle Dolan and Jake Hegge

Advisor: John Greany

Background: Hawthorn (*Crataegus laevigata*) is an herbal supplement marketed to promote a healthy circulatory system. The leaves, flowers, and berries contain antioxidant flavonoids which may dilate blood vessels, augment blood flow, and protect blood vessels from free radical damage. Research supports its efficacy in heart failure and potential use in decreasing angina and blood pressure; however, its acute effect on arterial circulation is unknown. Purpose: The purpose of this study is to determine the acute effects of the dietary supplement Hawthorn on brachial artery blood flow. Subjects: A convenience sample of 14 apparently healthy subjects (10 females, 4 males), age 25.4 + 8.0 years (mean + SD) completed the study. Methods: Baseline measurements were taken following a 12 hour fast including abstaining from exercise. The right brachial artery was identified and marked for each subject. The brachial artery diameter, timed average mean velocity, and blood volume flow were measured using a GE Healthcare LOGIQ P6 ultrasound system (Milwaukee, WI). After baseline measurements were obtained, each subject consumed 900 mg of Hawthorn extract (3, 150 mg capsules standardized for 2% vitexin twice daily) for 7 days and post-measurements were collected. Results: The blood volume flow increased significantly from 51.1 + 30.7 to 85.6 + 50.2 (ml/min) following 7 days consumption of Hawthorn supplement (p=0.01). There were no changes in brachial artery diameter or timed average mean velocity. Conclusions: The change in blood flow volume appears to be an effect of acute Hawthorn use on circulation in comparison to arterial diameter and flow velocities for healthy young individuals. Clinical Relevance: The results from this study provide some additional information on acute Hawthorn use for circulation in healthy adults; however further research is required to investigate its influence on individuals with known heart disease.

G.8 Comparison of the FGA and DGI in a Community-Based Exercise Program

Monica Rasmussen
Co-Author: John Greany and Erin Hussey
Advisor: John Greany, Health Professions

INTRODUCTION The Dynamic Gait Index (DGI) and Functional Gait Analysis (FGA) are two outcome based measures designed to assess a person's ability to modify balance during walking tasks. Both measures are valid, reliable, and easy to use. **PURPOSE** The goal of this study was to compare the DGI and FGA in a community-based exercise program for adults with neurological disorders. **SUBJECTS** 43 subjects (71.1 years \pm 12.1; 19 females, 24 males) with neurological disorders participated. **METHODS** Subjects attended a 12 week physical activity program (2x/week) for 60 minutes. Outcome measures (DGI and FGA) were assessed at baseline and after completion of the program. Additional outcomes measured were the Timed Up and Go (TUG), 5 timed Sit to Stand (5xSTS), and 6 minute walk test (6MWT). Correlation coefficients, effect sizes and paired t-tests were calculated as well as the Minimal Detectable Change (MDC) score. **RESULTS** There was a significant difference in pre/post scores for the FGA (20.1 \pm 6.7 to 21.5 \pm 5.2) with a medium effect ($d = -0.49$) and no difference for the DGI (18.5 \pm 4.5 to 19.4 \pm 3.2) with a small effect ($d = -0.38$). There was an excellent association between the DGI and FGA ($r=0.93$). Concurrent validity was examined and both clinical tests were excellent, however, FGA associations were slightly greater than DGI. MDC values were similar between FGA and DGI for subjects with Parkinson's disease (2 points) and slightly greater (4 points) for FGA compared to the DGI (3 points) for subjects with post stroke. **CONCLUSION** The excellent concurrent validity between the FGA and DGI with other outcomes measures indicate that both tests are useful tools for evaluating mobility in persons with neurologic conditions. However, the FGA test may be more sensitive to detect smaller changes in abilities with an individualized physical activity program.

G.9 Reliability of Blood Flow with Doppler Ultrasound by Student Clinicians

Kate Todd
Co-Authors: JF Greany, J Hegge, D Dolan
Advisor: John Greany, Physical Therapy

Background: The use of Doppler Ultrasonography is an emerging tool in Physical Therapy practice (musculoskeletal & vascular). **Purpose:** The purpose of this study was to investigate the intra-rater and inter-rater reliability of brachial artery blood flow with doppler ultrasound by student clinicians. **Subjects:** A convenience sample of 14 apparently healthy subjects (10 females, 4 males) age 25.4 + 7.9 years (mean + SD) completed the study. **Doppler images** were collected and examined by two student physical therapists with minimal training. **Methods:** Doppler Ultrasound images were collected on two occasions approximately one week apart. Measurements were taken following a 12-hour fast including abstinence from exercise. The right brachial artery was identified and marked at the antecubital fossa for each subject. The brachial artery diameter (cm) and timed average max velocity (TAMAX, cm/s) were determined by using a GE Healthcare LOGIQ P6 ultrasound system (Milwaukee, WI). Correlations were reported as intraclass correlation coefficients (ICC 3, 2 and ICC3,1) or Pearson's product-moment correlation coefficients. **Results:** Analysis revealed poor reliability between two novice testers ($n=28$; $ICC_{3,2} = 0.34$, $r=0.21$) for brachial artery diameter; and adequate for TAMAX ($ICC_{3,2} = 0.63$, $r=0.47$). Intra-rater reliability ($n=11$) for both raters ranged between poor to excellent for diameter and TAMAX (Rater 1- $ICC_{3,1}=0.22-0.97$; Rater 2- $ICC_{3,1}=0.23-0.89$). **Conclusion:** The results of this study suggest that physical therapy students with minimal training produce unreliable measurements using doppler ultrasonography. For most measurements there were slight improvements in reliability in the later data collection sessions suggesting that additional exposure to the equipment improved learning and consistency.

G.10 Effects of Step Frequency and Foot Strike Pattern on Achilles Tendon Stress During Running

Michael Lyght and Matthew Nockerts
Advisor: Thomas Kernozek, Physical Therapy

Purpose/Hypothesis: To compare the effect of step frequency and foot strike pattern on Achilles tendon (AT) stress during running. We hypothesized that peak AT stress, strain and strain rate will be lower during a rear-foot strike (RFS) compared to the nonrear-foot strike (NRFS) pattern. It is also hypothesized that there will be an inverse relationship between peak AT stress, strain and strain rate with step frequency within foot strike

conditions. Methods: Nineteen female runners (Age: 21.5 ± 1.3 yrs; Weekly Mileage: 31.9 ± 18.8 km) participated in the study. Transverse 2D ultrasound images were obtained of each participant's AT cross-sectional area before being equipped with 47 markers for 3D motion capture. Participants ran down a 20-meter runway under six conditions including a RFS and NRFS pattern at their preferred cadence, +5% preferred cadence and -5% preferred cadence. Speed was controlled to 3.33-3.68 m/s using photoelectric lights and foot strike was verified with an inshoe pressure system. 15 motion analysis cameras captured kinematic data while kinetic data were simultaneously collected using a force platform. Muscle forces were estimated using static optimization. Multivariate statistics with repeated measures were used to examine differences ($\alpha=.05$). Results: Peak AT ($p<0.001$) and peak force ($p<0.001$) were different between NRFS and RFS patterns. RFS exhibited reduced strain ($p<0.001$) and strain rate ($p<0.001$) compared to NRFS with differences of 24% and 15%, respectively. 5% above preferred step frequency exhibited differences in peak AT stress and strain relative to the preferred condition using a RFS ($p<0.001$) and NRFS ($p=0.005$) pattern. Strain rate was not different ($p>0.05$) between either foot strike condition. Conclusion: The manipulation of step frequency and the utilization of a RFS pattern may be beneficial in the treatment and prevention of AT-related injuries. We suggest that runners adhere to a transitional period if such conversion is indicated.

G.11 Effect of Somatosensory Stimulation on Central Nervous System Processing in Individuals with Shoulder Pain

Bridgett Comee, Jen Landsverk, Emmylou Hetland
Advisor: Patric Grabowski, Physical Therapy

Purpose/Hypotheses: The Neuromatrix theory of pain suggests that chronic pain leads to disorganization and slowing of CNS processing; therefore treatment aimed toward reorganization of central processing may enhance clinical efficiency. This reorganization has been demonstrated in stroke patients after somatosensory stimulation, but has not been investigated in chronic pain. The purpose of this study is to determine if one 2 hour session of somatosensory stimulation over the peripheral nerves in the forearm is effective in altering CNS processing, pain and function in individuals with chronic shoulder pain. The primary hypothesis is that stimulation will result in improvement on a test of hand laterality (Recognise Test). Methods: Matched-pairs randomized control trial. Participants with unilateral chronic shoulder pain were recruited and matched with healthy controls. Each pair of subjects was randomly assigned to the treatment or placebo group. The treatment group received a 2 hour session of somatosensory stimulation with 2 electrodes on the forearm. The placebo group received a 2 hour sham treatment. The primary outcome was average speed on the Recognise test. Secondary outcomes included resting pain level, frontal lobe blood oxygenation, and shoulder AROM. Results: Preliminary findings. Median age: 23.5 years. Males: 4, Females: 4. Healthy participants: 4, injured participants: 4. Placebo group: 2, treatment group: 6. All participants were right-handed, and had their right extremity stimulated. Percent improvement right shoulder flexion: healthy treatment 4.24 ± 1.51 ; healthy placebo 1.79; injured treatment 2.15 ± 1.51 ; injured placebo -2.03. Percent difference average speed on Recognise test: healthy treatment -4.71 ± 23.00 ; healthy placebo -3.85; injured treatment 21.10 ± 14.55 ; injured placebo 13.89. Relevance: Shoulder pain represents the second most common musculoskeletal complaint in the general population. Based on potential results of this study, somatosensory stimulation with a portable electrical stimulation unit could be an effective adjunct to treatment for individuals for individuals with chronic shoulder pain.

G.12 The Implications of the Quadratus Plantae Muscle Variations to Dry Needling Trigger Point Therapy

Daniel Allen, Skyler Debilzen, Alex Kasel, Amanda Langaard, Sean Naughton, and Zachary Rickaway
Co-Author: Thomas Grenier
Advisor: Thomas Greiner, Health Professions

Introduction The quadratus plantae (QP) is an intrinsic foot muscle that has been associated with heel pain. This muscle is typically comprised of a medial and lateral head; although, there can be variation in the presence, size, and orientation in one or more of these heads. Recent research supports the use of trigger point (TrP) dry needling (DN) of the QP to relieve heel pain. While DN methods describe needle placement, these methods rarely account for muscular variations. Our research evaluates QP variation and speculates how this variation may affect the efficacy of this therapy. Methods Observations were based on 82 limbs from 45 subjects associated with the UW-L Health Professions gross anatomy program. Data were drawn from

gross dissections of the foot and recorded observations on QP size, position, and morphology. Results We observed QP in three basic forms: two parallel heads (52/82), a single medial head (19/82), or a single lateral head (11/82). Variations were also observed regarding relative size and separation of the muscle heads, differences in fiber orientation, and in attachments to the long digital flexor tendons. Discussion/Clinical Relevance Therapists sometimes address foot pain by attempting to dry needle QP trigger points. However, common descriptions of this therapy make no mention of how to identify QP or of assessing its variations. Without considering the muscular variants we have described, there can be little confidence that the therapist is indeed treating a QP trigger point. While this research is unable to address the therapeutic outcomes of DN therapy, it would seem that its explanations are inconsistent with anatomical variation. Clinicians should consider the anatomical variations of the QP when attempting TrP DN. In addition, it is recommended that clinicians be aware of other potential muscle variations that may affect their TrP DN techniques.

G.13 Changes in Lower Extremity Movement and Reaction Times across the Adult Lifespan

Danielle Dolan
Co-Author: J Hegge, J Greany, T Kernozek
Advisor: John Greany, Physical Therapy

Background: Sustaining a fall can be a major contributor to disability, and in some cases, can even result in death. Assessments of postural control such as lower extremity reaction time (RT) and movement time (MT) have been found to be associated with fall risk. Objective: The purpose of this study was to establish a normative database for RT and MT, and to describe the changes in lower extremity RT and MT in adults across the lifespan. Subjects: One-hundred subjects between 18 - 87 years (approximately 12-15 per decade) participated in the study. Methods: Each subject performed two balance tasks (Speed Knee Bends (SKB) and Foot Tapping (FT)) assessing RT or MT. For the SKB, subjects were presented with a visual signal to flex their knees to achieve a specific angle for ten trials; time for initial response and time to reach the goal were measured. For FT, subjects were randomly given a visual signal to identify which foot should be used to tap a presented target and reaction time was measured. Data were averaged by decade and analyzed with a one-way ANOVA, and a post-hoc test was used for pairwise comparisons. Results: Significant differences ($p < 0.05$) were found in both reaction time and movement time between age groups. SKB-RT and SKB-MT for individuals over seventy were found to be different from the other decades of life, and FT-RT for those over sixty were found to be different from the other decades. Conclusions: These data suggest that lower extremity reaction time and movement time slow significantly starting in the sixties. Clinical Significance: A lifestyle incorporating strategies to maintain lower extremity reaction time and movement time should be established prior to age sixty.

G.14 Heart Rate and Energy Cost Responses of Log Rolling

Maria Cress
Advisor: John Porcari, Exercise and Sports Science

Log rolling was once a sport found only at traditional lumber jack competitions, but now has evolved into a recreational physical activity available to the public. The advent of the Key Log® has made this possible. The Key Log is a synthetic log which can be filled with water. The purpose of this study was to determine relative exercise intensity and caloric expenditure of log rollers using the Key Log®. Nineteen novice ($n=7$) and elite ($n=12$) log rollers completed up to seven rounds of log rolling depending on their ability. The seven rolling conditions were: 1) Key Log with three paddles, 2) Key Log with two paddles, 3) Key Log with one paddle, 4) Key Log with no paddles. 5) Key Log against another participant, 6) cedar log, and 7) cedar log against another participant. Heart rate (HR), oxygen consumption (VO_2), and rating of perceived exertion (RPE) were recorded. It was found that HR was elevated to between 69% and 91% of predicted max heart rate and caloric expenditure was calculated to be between 6.2 and 10.3 kcal per minute depending on rolling condition and roller ability. These results indicate that log rolling on the Key Log meets ACSM criteria for improving cardiorespiratory endurance and can positively affect body composition.

G.15 The Effects of Kinesiology Tape on Shoulder Pain and Range of Motion for Individuals with Shoulder Pain

Reggie Ronning

Co-Authors: Naoko Aminaka, Scott Doberstein, Kari Emineth, and Christy Schultz

Advisor: Naoko Aminaka, Exercise and Sports Science

Context: The effects of Kinesiology Tape (KT) on pain and range of motion (ROM) are inconsistent and have not been tested using 3D analysis on functional shoulder motion. Objective: To determine the effects of KT on shoulder pain and ROM for individuals with existing shoulder pain. Design and Setting: All testing for this crossover study was performed in a university biomechanics laboratory. Subjects: Twenty collegiate students (9 female, 11 male) with existing shoulder pain participated in this study. Interventions: Subjects performed repetitive maximum overhead throws and pushups. Subjects performed the same testing with one tape method for immediate effects (10 minutes post-tape) and delayed effects (48 hours post-tape). A minimum of one week was given as a wash-out period, and the procedure was repeated with a separate taping method. The two methods of taping included therapeutic and sham. Subjects were blinded as to the intended outcome of the two taping methods, and the order of the taping methods was randomized. Measurements: Maximum dominant shoulder abduction and external rotation angles in the cocking phase were recorded using 3D motion analysis. Surveys were used to record pain, comfort, and stability levels in the shoulder before and after exercise sessions. Independent measures included taping methods (therapeutic, sham) and time (baseline, 10 minutes, 48 hours) Results: The results of this study are pending due to current data collection. Anecdotal findings seem to advocate the effects of the therapeutic taping technique on improving pain and comfort as well as improving shoulder abduction and external rotation. Conclusions: Although the conclusions cannot be drawn at this point, we anticipate that the results of this study will help clinicians make a more informed decision regarding the use of KT for improving pain and function for those with shoulder pain. Key Words: kinesiology tape, 3D analysis, shoulder biomechanics

G.25 Student Affairs Graduate Internship in Germany

Noelle Ponasik

Advisor: Jodie Rindt, Student Affairs Administration

Internationalization is an emerging trend in higher education. According to the Association of International Educators, "students who study abroad, participate in scholarly exchange programs, or study foreign areas and languages are far better prepared for the demands of the 21st century" (Osfield, 2008, p. 3). The Student Affairs Graduate Internship in Germany is a pilot program intended to expand graduate internships abroad, thus contributing to international educational leadership opportunities and the evolving global perspective in the student affairs profession. This pilot program took place at Frankfurt University of Applied Sciences in Frankfurt, Germany from July through December 2014. Internship sites included various student affairs offices, such as the International Office, Student Advising Services, Office of Family Affairs, and the School of Business and Law. The internship program allowed for a complete overview of student services in the context of higher education in Germany. The success of the pilot program will be used by the Student Affairs Administration (SAA) Department in Higher Education at UW-La Crosse as a model to expand international internship opportunities for future student affairs educators.

GRADUATE POSTER PRESENTATION ABSTRACTS

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

G.16 Achilles Tendon Stress during Typical Progressions of Therapeutic Exercises

Andrew Revak and Keith Diers
Advisor: Thomas Kernozek, Health Professions

Achilles tendon injuries are common orthopedic conditions seen in medical and rehabilitation settings. These injuries are more common in males and in higher impact sports that involve running, jumping, and other quick movements. Injuries to the Achilles tendon often result in surgery to repair the damaged tissue followed by specific exercise interventions to return to activity. Most often, therapeutic strengthening exercises are given that provide stress to the injured tendon to promote healing and prevent further injury. However, the Achilles tendon stress in commonly used therapeutic interventions has not been evaluated. Our purpose was to examine the stress in the Achilles tendon during commonly used rehabilitation exercises. Twenty-two physically active and healthy male participants between the ages of 18 and 25 completed a series of 17 therapeutic exercises. Kinematic data were captured during the exercises with a 15 camera motion analysis system at 180 Hz and was synchronized with kinetic data from a force plate collected at 1800 Hz. Additionally, the cross sectional area of all participants' Achilles tendons were measured using diagnostic ultrasound. Muscle force estimates from static optimization and Achilles tendon cross sectional area will be used to estimate tendon stress. A repeated measures statistical analysis will be used to determine differences in stress between these exercises. Based on our initial observations, we anticipate that the more static exercises will result in lower amounts of stress in the Achilles tendon while the higher impact exercises will result in greater levels of stress.

G.17 Patellofemoral Joint Stress in Two Different Squat Techniques

Jordan Hove and Matt Zellmer
Advisor: Thomas Kernozek, Physical Therapy

Patellofemoral pain syndrome (PFPS) is a common orthopedic problem prevalent in active populations, with an incidence rate in women nearly double to that of men. The etiology of this condition is thought to be caused by increased patellofemoral joint stress. Our aim was to quantify differences in patellofemoral joint stress that may occur in squat techniques that vary in the amount of anterior knee translation during the ascent and descent phase of a squat. Twenty-five healthy females completed five trials of two squat techniques that varied the anterior translation of the knees in relation to the toes during the squat. A static optimization technique utilizing kinetic and kinematic data to estimate the individual muscle forces was used and these values were input into a model of the patellofemoral joint to estimate the joint stress during both squat techniques. Preliminary findings demonstrated a 20% decrease in maximum patellofemoral joint stress between the two techniques. Similar differences were found in the average patellofemoral joint stress between techniques. Limiting anterior translation of the knees during a squat may be a beneficial clinical recommendation to reduce patellofemoral stress.

G.18 The Effects of Corrective Exercises on Functional Movement Screen Scores among NCAA Division III Athletes

Kevin Gullion
Advisor: Naoko Aminaka, Exercise and Sports Science

Objective: This study was designed to examine the effects of corrective exercises on Functional Movement Screen (FMS) scores. Setting: This study took place at the University of Wisconsin-La Crosse over an eight week period in Fall 2014. Participants: Eighteen Division III collegiate track athletes (13 males and 5 females; age = 19.5+/-1.3 years, height = 181.1+/-9.9 cm, mass = 77.7+/-15.5 kg) volunteered for the study, and were randomly assigned to the control (n=10) or experimental group (n=8). Interventions: The control group performed three separate FMS sessions at four week intervals. The experimental group performed the same FMS sessions in addition to a corrective exercise program over the whole eight week period. Measures: a repeated measures ANOVA was utilized to detect differences in FMS scores among groups

(control, experimental) and times (baseline, week 4, week 8). Results: There was a significant effect of time ($p < 0.001$) and group by time interaction ($p = 0.02$). Post-hoc pairwise comparison showed that there was a significant difference in FMS scores between baseline and week 4 ($p = 0.009$) and between baseline and week 8 ($p = 0.001$) for the experimental group, while the FMS scores were not significantly different across time in the control group. Neither group saw significant improvements between week 4 and week 8. Conclusions: The results show the experimental group had significant improvements on the FMS scores overall, with the majority of improvements coming in the first four weeks. While the control group did improve, these changes were not significant when compared with the experimental group.

G.19 Regulation of *Escherichia coli* fimB and fimE by OMRA and OMRB in a Low PH and High Osmolarity Environment

Ina Wu
Advisor: William Schwan, Microbiology

Uropathogenic *Escherichia coli* (UPEC) causes more than 90% of all urinary tract infections. Pathogenicity of UPEC within the urinary tract is dependent on the expression of type 1 pili, which allows UPEC to bind to the uroepithelium. FimB and FimE are two site-specific recombinases regulating the expression of fimA, which codes for the major subunit of the type 1 pilus. Expression of fimB and fimE depends on the pH and osmolarity of the growth environment. The EnvZ/OmpR two component system regulates osmolarity in *E. coli* and the expression of two small RNAs, OmrA and OmrB. To determine if OmrA and OmrB regulate fimB, fimE, and fimA expression, β -galactosidase activity assays were done to measure fim expression in *E. coli* K-12 wild-type, Δ omrA, Δ omrB, and Δ omrAB mutants containing lacZ fusion plasmids under the control of a respective fim promoter. Cultures were grown to log and stationary phase under four conditions: pH 5.5 \pm 400mM NaCl and pH 7.0 \pm 400mM NaCl. Under low pH and high osmolarity, the Δ omrAB mutant had 1.5-fold higher fimB and >3-fold more fimE expression in log and stationary phase compared to wild-type. In stationary phase, fimE expression was higher in the Δ omrAB mutant compared to wild-type for all environments tested. No significant difference in fimA expression was detected between mutant strains and wild-type. These results suggest that OmrA and OmrB may control expression of fimA and subsequently type 1 pilus by regulating fimB and fimE in *E. coli* under low pH and high osmolarity conditions.

G.20 Do Daily Fluctuations in Broad Jump Performance Relate to Daily Fluctuations in T/C Ratio in Collegiate Weightlifters?

Kyle Peterson
Advisor: Matthew Andrew, Exercise and Sports Science

The purpose of this study is to monitor testosterone, cortisol, and the ratio of testosterone to cortisol in collegiate weightlifters, daily, throughout one week of training, and compare the hormonal fluctuations to daily broad jump performance. Five collegiate weightlifters will perform their normal duties as assigned, but each will give a salivary sample upon arriving for their regularly-scheduled afternoon practices, daily, for one week. Changes in salivary hormones will then be compared to changes in broad jump distances (meters). After all of the samples have been collected, enzyme immunoassays will be used to determine the concentration of testosterone and cortisol within each sample. One-factor (time) RM ANOVA will be used to help determine relationships between hormones and broad jump distances throughout the week. Significance will be determined a priori ($\alpha = .05$).

G.21 Reliability and Validity of the Kiio Sensor for Assessment of Muscular Performance of Shoulder External Rotation

Stephen Siegle and Michelle Narveson
Co-Author: Patrick Grabowski
Advisor: Patrick Grabowski, Physical Therapy

Purpose: Evidence based physical therapy relies on objective assessment to guide treatment and measure patient outcomes. Current methods to assess muscle performance each have their own disadvantages, encouraging new methods and tools to be developed. The kiio Sensor (Kiio Inc, Madison, WI) is a new device that uses a small, portable, digital strain gauge to quantify muscle performance, but has not yet been validated. The purpose of this study is to investigate the test-retest reliability and criterion validity of the kiio

Sensor. Participants: 28 (17 male) adults (mean age= 21.79 yrs, SD= 1.52) with no history of upper extremity injuries in the last year. Methods: Day 1 the participants performed maximal isometric contractions of standing shoulder external rotation using both the kiiio Sensor and a Cybex isokinetic dynamometer. The participants then performed 1 endurance trial with the kiiio Sensor, maintaining 60% of their average peak force for as long as possible. Seven days later participants came in for session 2 where they again performed the same isometric contractions and 1 endurance trial with the kiiio Sensor. Results/Conclusions: Intraday reliability for peak isometric force for the kiiio Sensor was ICC3,1= 0.95 (MDC = 0.91 lbs). The kiiio Sensor 7-day test-retest reliability for peak isometric force was ICC3,2= 0.97 (MDC = 1.05 lbs), and for endurance ICC3,1=0.76 (MDC = 16.49 sec). A Pearson correlation coefficient was calculated for the mean kiiio Sensor and Cybex force values from session 1 ($r = 0.89$), and an independent t-test showed no difference between the two devices (mean= - 0.70, $p=0.71$). The kiiio Sensor is a valid and reliable method to quantify peak isometric force for shoulder external rotation. The reliability of the endurance test is also clinically acceptable. The kiiio Sensor presents several advantages and appears likely to increase the clinical efficiency of rehab professionals.

G.22 Analysis of the Kinematic and Kinetic Parameters of High Velocity, Low Amplitude Manipulations Performed by Experienced Physical Therapists

Craig Johnson and Josh McLain
Co-Author: Patrick Grabowski
Advisor: Patrick Grabowski, Physical Therapy

Purpose: Previous research has explored the kinetic properties of high velocity, low amplitude (HVLA) manipulations with results showing that alterations to these kinetic parameters may enhance patient outcomes. Quantifying kinetic parameters, impulse duration, requires sophisticated equipment, which most clinicians do not have access to. Kinematic measures, velocity, may be a more accurate and feasible option to analyze and quantify manipulation characteristics. Therefore, the purpose of this study was to analyze and compare the kinematic and kinetic parameters of HVLA manipulations performed by experienced physical therapists (PT's) to determine if kinematic measures alone are representative of the PT's performance of HVLA manipulations. Subjects: Seven experienced PT's. Seventy asymptomatic subjects. Methods: PT's delivered seven HVLA posterior to anterior thoracic spine manipulations and seven talocrural manipulations to ten different asymptomatic subjects. Reflective markers were attached to the PT's upper extremities along with a pressure sensor positioned between the therapist-subject interface. Results/Conclusion: A Pearson's correlation was used to determine a good relationship (Colton 1974) between velocity and force impulse durations with $r=0.766$. A repeated measures ANOVA examined the difference between manipulation type and impulse durations of the peak pressure (PP), peak force (PF), and velocity profiles. No significant difference were found between manipulation type ($p=.208$) or between PP and PF ($p=.134$). Significant differences were found between velocity and PP ($p=.000$), and velocity and PF ($p=.000$) Clinical Relevance: These findings suggest that we can consider using kinematic parameters, such as velocity, alone to accurately represent the HVLA manipulation profiles of experienced physical therapists. Therefore, we can utilize kinematic measures to assess these velocities within the clinical setting on a large patient population to further track the effects of altering velocity on outcomes, patient satisfaction, and PT efficiency.

G.23 The Relationship Between Training Loads, Impact Forces, Perceived Recovery, and Reactive Strength Index in Collegiate Volleyball

Eric Linnell
Co-Authors: Glenn Wright, Clayton Camic, Scott Doberstein, and Allyson Stone
Advisor: Glenn Wright, Exercise and Sports Science

Adequate training volume and intensity is pivotal for coaches and strength and conditioning personnel to stimulate performance-enhancing adaptations. To our knowledge there are no studies examining internal and external training load and how they affect perceived recovery status and the neuromuscular system by means of the reactive strength index. PURPOSE: The purpose of this study was to quantify the physical demands of a Division III women's volleyball season and differentiate between preseason and in season practice through multiple means of athlete monitoring, including accelerometers worn by subjects, session RPE, and neuromuscular fatigue assessment through reactive strength index testing. METHODS: 12 experienced female collegiate volleyball players (19.6 ± 1.2 years) participated in this project. Participants responded using a 0-10 survey to provide perceived recovery and session rating of perceived exertion

values. The question “How recovered do you feel?” was asked prior to every practice session during the entirety of the preseason, and prior to each practice every other week in-season. For the session rating of perceived exertion participants responded to the question “How hard was your workout” within 30 minutes following each practice session during the preseason, and each practice every other week in-season. The reactive strength index was used as a measure of neuromuscular fatigue. Participants performed three drop jumps from a height of 30cm before and after each practice session during the preseason, and each practice every other week in-season. Mechanical load measurements were acquired through the use of Zephyr BioHarness’s worn around chest. RESULTS: Currently being processed and analyzed. Conclusion: We expect to see a significant correlation between internal load and mechanical load. Recovery and performance values are expected to be decreased during the pre-season time compared to the in-season. A significant correlation between number of impacts with each range and internal load is expected.

G.24 The Effects of Running Volume in Training on Muscle Damage, Muscle Soreness, and Recovery After a Marathon: An Observational Study

Kevin Gries

Co-Authors: Glenn Wright, Clayton Camic, Carl Foster, and Eric Linnell

Advisor: Glenn Wright, Exercise and Sports Science

Running a marathon requires a large amount of training and causes significant amount of muscle damage. To our knowledge, no previous studies have examined the effects that the volume of marathon training has on muscle damage, muscle soreness, and muscle recovery. PURPOSE: The primary purpose of this investigation was to determine if running volume provides a protective effect to reduce muscle damage and the amount of perceived muscle soreness, and improve the perceived recovery status after a marathon. METHODS: Ten subjects (men, n= 4; women, n=6; age 28.7 ± 7.3 years) from the local community whom were training for a Boston Qualifying marathon participated in the investigation. Subjects visited the laboratory one to two days prior to running the marathon. Training logs were collected including each subject’s distance run each week and the longest weekly run over the 10 weeks prior to the marathon. A fingertip blood sample was given to determine serum creatine kinase (CK) levels. Perceived soreness was determined using a 0 (little soreness)-10 (extreme soreness) Likert scale following descending down a flight of steps, and perceived recovery from the marathon was determined by a 0 (not recovered)-10 (very well recovered) Likert scale following running 1.6 km on a motorized treadmill at a velocity similar to 80% of their predicted marathon pace. These tests were then completed again one day (D1), three days (D3), and six days (D6) following the marathon. RESULTS: Completion of the marathon induced large increases in CK on D1, D3, and D6 (71.58 ± 23.82 , 560.12 ± 443.91 , 262.2 ± 270.54 , and 240.73 ± 244.18 IU/L, respectively). A decreasing trend was found ($p=0.054$) in CK between D1, D3, and D6. However, a large effect size was observed ($\eta^2P=0.39$) between the time points. Perceived soreness increased significantly ($P=0.002$) from pre-marathon to D1 (0.167 ± 0.083 to 5.06 ± 1.02); however, subjects returned to pre-marathon levels by D3 and remained at PRE levels through D6. Perceived recovery decreased significantly ($p<0.01$) from pre-marathon to D1 (9.50 ± 0.224 to 2.60 ± 0.653). Subjects then recovered significantly ($p<0.01$) from D1 to D3 (5.80 ± 0.629) and did not change ($p=0.09$) at D6 (7.15 ± 0.527), not returning to baseline. There were no significant Pearson correlations ($p=0.066-0.873$) when comparing long run or volume of training to peak CK, muscle soreness, and perceived recovery. In addition, no significant Pearson correlations were found comparing long run or volume of training to CK, muscle soreness, or perceived recovery on D6. CONCLUSIONS: The data indicates that the volume of training is not related to the magnitude nor recovery of muscle damage, muscle soreness or perceived recovery after running a marathon. PRACTICAL APPLICATIONS: Coaches should not expect marathoners to be able to return to productive training sooner based on their volume of training.

GRADUATE ORAL PRESENTATION ABSTRACTS

GR.1 Tournament Angling in Wisconsin: The Economic Impact of Bass, Salmon, and Walleye Fishing Tournaments on Host Communities

Sara Erickson
Co-Authors: Dr. David Reineke and Eric Leis
Advisor: Steven Simpson, Recreation Management

This study investigated the economic impacts of tournament angling, specifically bass, salmon, and walleye fishing tournaments on host communities in the state of Wisconsin. Fifteen salmon, bass, and walleye tournaments were surveyed throughout the summer of 2014 to determine dollar values associated with each tournament. Tournament anglers were asked to share information on their spending habits throughout their stay in the community hosting the event. Anglers were asked to track their expenditures in nine main sectors: housing, grocery stores, restaurants, automobile transportation, boat operation, fishing equipment, boat launch fees, entrance or parking fees, and entertainment. Total median spending amounts for the bass, salmon, and walleye tournaments surveyed were \$555.00, \$371.00, and \$1,562.00 respectively. Housing accounted for bass anglers' largest expenditure with a median value at \$150.00. Salmon anglers' largest expenditure was boat operation with a median value at \$100.00. Walleye anglers spent the most money overall with their largest expenditure also being housing with a median value of \$400.00.

GR.2 Relation among Methylmercury, Selenium, and Biomarkers of Oxidative Stress in Livers of Northern Pike

Jason Magnuson
Advisor: Mark Sandheinrich, Biology

Methylmercury is a toxic element that has been associated with oxidative stress in freshwater fish. A known antagonist to mercury, selenium (Se), may reduce the toxic effects of mercury. In this study, we examined the relation among mercury, selenium, and the expression of biomarkers of oxidative stress and metal regulation in livers of northern pike. Livers from 96 northern pike were collected in May 2011 and 2012 from 12 lakes in Voyageurs National Park, Isle Royale National Park, Pictured Rocks National Lakeshore, and Sleeping Bear Dunes National Lakeshore. Concentrations of methylmercury, total mercury, and selenium were measured in liver tissue and the expression of superoxide dismutase (SOD), catalase (CAT), glutathione s-transferase (GST), and metallothionein (MT) was measured with qPCR. Quantile regression was used to examine changes in the maximum expression of each biomarker associated with changes in selenium and mercury concentrations in liver tissue. The 80th ($\tau=0.80$), 85th ($\tau=0.85$), and 90th ($\tau=0.90$) quantiles were estimated for the relation between the normalized expression of each gene and the molar ratio of selenium and methylmercury (MeHg) in the liver. Maximum expression of SOD and CAT, but not GST and MT, were inversely related to Se:MeHg. These results suggest that expression of SOD and CAT are altered by selenium and mercury due to the protective effect of selenium against oxidative stress.

GR.3 Mechanism of Microtubule Rod Formation in 13-lined Ground Squirrel Platelets

Xingxing Lin
Advisor: David Howard, Biology

The mechanism of 13-lined ground squirrel platelets long time low temperature preservation is still a mystery. Microtubules maintain the shapes of platelets. In human platelets, even after a brief chill, the disassembly of microtubule rearranged the distribution of membrane proteins, especially glycoproteins. The redistribution of Glycoprotein Ib from linear to cluster led to platelet clearance in blood circulation even after re-warmed back to body temperature. This phenomenon becomes an obstacle of low temperature platelets preservation. On the contrary to human platelets, 13-lined ground squirrel platelets are still functional after preserved at 4°C for around 5 months during hibernation. Different from disassembly, ground squirrel microtubule formed rods at low temperature. Microtubule formed similar size ring after re-warm back to body temperature. The mechanism of ground squirrel microtubule shape change is still unknown. This research conducted platelet activation assay to assess platelet function and activation after low temperature preservation in vitro. This

research also tested microtubule assembly and disassembly involvement of ground squirrel platelet rod formation by using taxol and nocodazole. Additionally, this research analyzed the involvement of microtubule sliding by labeling end binding protein EB3, gamma tubulin, and motor protein dynein. The result of this research will be an insight of study human platelet preservation.

GR.4 Therapeutic Recreation at Camp: A Delphi Study Identifying Important Elements of Therapeutic Recreation When Applied During a Residential Summer Camp

Wayne Means

Advisor: Steven Simpson, Recreation Management

For thousands of individuals across the country, summer marks the time to make the journey to camp to experience new activities, reunite with friends, and explore nature. For many individuals with disabilities, this means a camp that offers intentional recreational activities designed to meet specific goals. These camps utilize the process of Therapeutic Recreation (TR) that typically includes assessment, planning, implementation, and evaluation. While research continues to report the benefits campers experience (see Michalski, et al., 2003), there is a clear gap as to what components, or elements, of the TR process are responsible. Thus the purpose of this study was to identify the most important elements of Therapeutic Recreation when applied to residential summer camps for individuals with disabilities. To identify these elements, this study utilized a panel of experts (n=8) through a Classic Delphi approach. These experts, with a mean of 16 years of experience as Certified Therapeutic Recreation Specialists and 12 years at camp, initially identified 29 elements. Then in following rounds of the Delphi, a 7-point Likert scale provided ratings and definitions of the elements and explained why they are specifically valuable at camp. Statistical analysis identified 9 elements as being the most important (receiving a rating of 6 or 7 by 100% of the panelists), and they were: (1) Planning, (2) Evaluation, (3) Socialization, (4) Implementation, (5) Staff Qualifications & Competency Assessment, (6) Management, (7) Prevention, Safety Planning, and Risk Management, (8) Program Evaluation & Research, (9) Quality Improvement. Identifying these key elements is an important step in developing a framework for future research as well as justification for TR service and prioritizing which elements should be considered when creating a TR camp program.

GR.5 A Novel Virus Discovered in White Sucker Fish: Characterization and Assessment of Risk to Wisconsin White Sucker Populations

Heather Hutchings

Co-Author: Marisa Barbknecht

Advisor: Michael Hoffman, Microbiology

The freshwater fish *Catostomus commersonii* (white sucker) is common to North American waters and is important both ecologically and economically as a bait fish. In 2012, an unknown virus was isolated from white suckers during a large scale baitfish study done by the La Crosse Fish Health Center. To further characterize this virus, it was sent to UW- La Crosse for further study in Dr. Michael Hoffman's lab. Preliminary molecular analysis done revealed that the virus was most closely related the Bunyaviridae family. To better understand the risk posed by this virus to natural white sucker populations we conducted a survey for the virus in wild fish populations in Wisconsin and an experimental challenge to determine the pathogenicity of the virus. To begin this work, a diagnostic RT-PCR was developed to detect viral nucleic acids from tissue samples from infected fish. A survey of white suckers from 12 Wisconsin waters for the presence of WSV was then conducted with no positive samples being discovered. An experimental challenge is now being conducted to test for the pathogenicity of the virus.

GR.6 Effects of Flooding, Invasion and Nitrogen Addition on Nitrogen Cycling in the Upper Mississippi River Floodplain

Whitney Swanson

Co-Authors: Nathan De Jager and Eric Strauss

Advisor: Eric Strauss, Biology

Nitrogen (N) additions through atmospheric deposition and agricultural runoff are increasing globally, often with harmful effects on terrestrial and aquatic ecosystems. Floodplain forests can act as effective sinks for nitrogen which could reduce downstream transport and eutrophication of aquatic ecosystems. However, the

ability to remove excess nitrogen efficiently may be altered by invasion of exotic species or increasing nitrogen deposition. We examined the effects of flooding and nitrogen additions on physical soil properties and nitrogen cycling within 2 established vegetation communities (mature silver maple forest and invasive reed canarygrass) in an Upper Mississippi River floodplain. A series of split plots were established within each vegetation type along an elevation gradient and treated with nitrogen additions throughout the summers of 2013 and 2014 following the end of spring floods. Nitrogen additions were administered to 2x the current ambient N deposition rate per year for the area. Soil samples were collected monthly during the growing seasons of 2013 and 2014. Physical soil properties were explained best by elevation with the lowest plots maintaining the highest percent organic matter as well as the lowest bulk density throughout the growing season, regardless of vegetation type or time after flooding. N-cycling processes and N-availability, however, were best explained by vegetation type and time after flooding. The differences due to vegetation type were consistent on top of the differences due to time after flooding. Fertilization resulted in a decreased soil CN ratio within forest plots in 2014. Preliminary results suggest that nitrogen accumulates faster in reed canarygrass soils compared to mature forest soils which can help to better understand the consequences of invasion on floodplain ecosystems. Results also suggest that mature floodplain forests in the UMR may show effects of long-term N additions from atmospheric deposition.

2014 UNDERGRADUATE RESEARCH AND CREATIVITY GRANT RECIPIENTS

Name	Department	Mentor	Title
Lexie Adams	Health Education and Health Promotion	Keely Rees	Health Differences Between New Zealand, Australia, and United States Elementary Schools
Kayla Ballard	Psychology	Katherine Kortenkamp	The Relationship Between Family SES and College Student Stress Levels
Christina Burkhart	Biology	Eric Snively	La Crosse, WI Native Canids: Population Composition and Human-Wildlife Overlap
Riley Buley	Biology	Alysa Remsburg	Effects of Roadways in Wetlands on Dragonfly Communities
Katherine Busniewski	Biology	Sumei Liu	Effects of hibernation on the enteric nervous system in thirteen-lined ground squirrel stomach.
Emilee DeSmet	Biology	Anita Baines	Nutrient Utilization of Streptomyces in Myrick Marsh
Joe Drumm	Biology	Joan Bunbury	Climate change and the northern expansion and contraction of Mississippian peoples at Aztalan, A.D. 1000-1250
Rena Elwood	Psychology	Karen Skemp	Body Image Perception in Adolescent Males
Alexandra Filipovich	Theatre Arts	Joe Anderson	The Evolution of The Flamenco Dress
Elijah Geromo	Biology	Sumei Liu	Effects of stress on the expression of urocortins in the rat stomach
Elisabeth Granley	Sociology/ Archaeology	Tim McAndrews	A Lithic Analysis of Food Preparation and Resource Distribution in Recuay Ritual Feasting Contexts at Hualcayán (Ancash, Peru)
Elissa Harter	Microbiology	William Schwan	Killing Capabilities of SK-03-92 Persisters Compared to Parent Strains
Sarah Jaech	Psychology	Suthakaran Verrasamy	Foreign accents: The effect of stereotypic content on credibility
Jaimi Jensen	Biology	Dan Grilley	Salt-induced Changes to the Stability of Poly(dA-dT) Tract DNA and Implications for Nucleosome Formation
Brandon Jones	Exercise and Sports Science	Naoko Aminaka	Effects of Kinesiology Tape on Performance and Serum Creatine Kinase during Recovery from Delayed-Onset Muscle Soreness
Jordan Keller	Geography and Earth Science	Joan Bunbury	Collection and initial description of Mississippi River backwater sediment cores
Shannon Klein	Biology	Eric Snively	Comparing bone stresses of running and jumping in the legs of female and male university athletes.
Erik Kullerud	Political Science/Public Administration	Carol Miller	Officer-Worn Cameras: Can they be an Effective Tool for Law Enforcement Personnel in the La Crosse Area?
Timothy Lomeli	Psychology	Alessandro Quartiroli	Attitudes, Behaviors, Motives, and Settings Related to Drinking: A Cross-Cultural

			Anaylsis
Jenna Malinauskas	Biology	Anita Baines	The Effects of Myrick Marsh Streptomycetes on the Growth of Human and Plant Pathogens
Brittany Maule	Biology	Virginia Crank	UW-L Writing Center Usage Analysis: How Can We Better Address Students' Needs?
Danielle Nolden	Educational Studies	Binod Shrestha	Learning to Draw from Live Figures
Alex Olson	Biology	Tisha King-Heiden	Refining our understanding of the toxicity of the sediments from Myrick Marsh
Kingsley Ozongwu	Biology	Anne Galbraith	Effect of the Antimicrobial SK-03-92 on Growth of Yeast Mutants
Cole Paulsen	Physics	Eric Gansen	Optimizing the Detection Circuitry of Quantum-Dot-Based Single-Photon Detectors
Corinne Rabay	Biology	James Longhurst	Planning for a future "On the Go": Using GIS to Understand the Behavior of UW-L Commuters
Elizabeth Reesman	Psychology	Katherine Kortenkamp	Are You Good Without God?: Effects of Religious Identity Affirmation and Threat
Eric Ruzicka	Chemistry and Biochemistry	Heather Schenck	An Analysis of the Conformations of Hydroxamic Acids
Mary Sagstetter	Microbiology	Bradley Seebach	The effects of chronic caffeine exposure on muscle fiber excitations in <i>Drosophila melanogaster</i> larva
Sarah Schultz	Sociology/ Archaeology; Art	Heather Walder, Brad Nichols; Binod Shrestha, Constance Arzigian	Reformation of Native American Trade Beads into larger Pendants; Illustrating the Past
Ryan Sneath	Geography and Earth Science	Joan Bunbury	Radiocarbon dating of lake sediments for the development of a climate record for the ancient settlement of Aztalan (A.D. 1000-1250)
Sarah Stepanik	Sociology/ Archaeology	Constance Arzigian	The Presence of Levallois Blades at Hadži Prodanova Pećina, Serbia
Brynn Sundberg	Biology	Anton Sanderfoot	Chlamydomonas and the Search for Secretion's Missing Plant Genes
Christopher Swoger	Sociology/ Archaeology	Katherine Grillo	Obsessively Opacifying Obsidian: Adapting Three Dimensional Laser Scanning Techniques
Lowell Thompson	Psychology	Alexander O'Brien	Embracing the Whole Spectrum: An Investigation of Females with Tetrachromacy
Yen Trinh	Finance	Shane Van Dalsem	International Students and Financial Institutions: Examining Financial Literacy and the Factors Leading to Banking Decisions
Danielle VanBrabant	Biology	Barrett Klein	Cultural Entomology Database
Carol Vang	Communication Studies	Linda Dickmeyer	Racial Microaggressions as Experienced by Asian American Females
Aaron Vesey	Philosophy	Mary Krizan	Warp Drive Space-times in the Weak Field

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Megan White	Psychology	Betsy Morgan	Conscious vs. unconscious primes: Eliciting prosocial behaviors in the presence of bystanders
Tim Wilda	Geography and Earth Science	Colin Belby	Using Charcoal to Reconstruct Sedimentation History of the Upper Mississippi River
Emma Weibel	Biology	Gretchen Gerrish	Who's your daddy? The occurrence of multiple paternity in <i>Photis annecton</i>
John Weirich	Chemistry and Biochemistry	Adrienne Loh	Designing Better Antibiotics: Modeling the Interaction Between Model Antimicrobial Peptides and Detergent Micelles

**GRADUATE RESEARCH,
SERVICE AND EDUCATIONAL LEADERSHIP AWARD RECIPIENTS**

Name	Department	Mentor	Title
Amy Baker	Microbiology	Bill Schwan	The effects of a putative two component regulatory system in <i>Staphylococcus aureus</i> on biofilm formation and sortase a expression
Alex Beauchene, Sara Fry, and Sam Sonnek	Clinical Exercise Physiology	Carl Foster	Rockport II: Incremental test to measure VO ₂ mx/VT in broad range of people. Compare prediction from Rockport HR equation vs equation built on RPE
Katherine Bohrman	Biology	Eric Strauss	The effect of geomorphology on transient storage and phosphorus uptake in Spring Coulee Creek
Maria Cress	Exercise and Sport Science	John Porcari	Heart Rate and Energy Cost Responses to Log Rolling
Rhiannon Fisher	Biology	Eric Strauss	Impact of hydrology on particle (seston) quality and quantity in reach (Navigation Pool 8) of the Upper Mississippi River
Megan Foss	Exercise and Sport Science	Carl Foster	Effects of Speech Passage Duration on Talk Test Response
Kevin Gries	Exercise and Sport Science	Glenn Wright	Volume of marathon training on muscle damage, muscle soreness, and recovery
Kyra Halverson	School Psychology	Betty DeBoer	Behavioral Consultation: Promoting Self-Efficacy with Teachers
Brittany Harried	Biology	Meredith Thomsen	The effects of Biological Soil Crusts on species diversity and soil properties in Wisconsin
Anthony Heil	Recreation Management	Gretchen Newhouse	Outdoor Recreation Living and Learning Communities in Higher Education
Jennifer Hill	Therapeutic Recreation	Susan Murray	Design and Implementation of a Lakshmi Voelker Chair Yoga [®] Program for Older Adults as a Therapeutic Recreation Physical Activity Intervention
Kyle Kaszynski	Biology	Thomas Volk	Cultivation of the Wood Blewit, a delicious and beautiful edible mushroom
Elizabeth Leighton	Biology	Thomas Volk	Endophytic fungi in two native and two invasive plant species
James Lewis	Exercise and Sport Science	Jeff Steffen	Occupational Socialization of Taiwanese Outward Bound Educators
Dan Liska	Microbiology	Bonita Bratina	Chemical and bacterial composition in landfill simulating reactors when mixed

			with fly ash
Hannah Mello	Biology	Gretchen Gerrish	Distribution and Relative Abundance of Bryozoan Species in the Upper Mississippi River Watershed
Marcia Morales	Community Health Education	Gary Gilmore	Health Education Graduate Costa Rica Perceptorship
Matthew Mosiman	Exercise and Sport Science	Matthew Andre	Relationships between Hormonal Fluctuations and Performance in Collegiate Weightlifters
Nathali Niedorowski	Exercise and Sport Science	Jeff Steffen	Occupational Socialization of New Zealand Adventure Educators
Kyle Peterson	Exercise and Sport Science	Matthew Andre	Do Daily Fluctuations in Broad Jump Performance Correlate with Daily Fluctuations in T/C Ratios in Collegiate Weightlifters?
Brandon Potter	Biology	Anita Baines	Biocontrol Potential of Chestnut Endophytes Against Blight Fungus
Kristen Reich	Recreation Management	Steven Simpson	National Outdoor Leadership School Experiential Learning Sea Kayaking Course in Sound, Alaska
Alicia Weeks	Biology	Roger Haro	Modeling spatial relationships between the invasive snail <i>Bithynia tentaculata</i> and submersed aquatic using long-term monitoring data

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Presenter Index

U = Undergraduate Poster; UR = Undergraduate oral; G = Graduate Poster; GR = Graduate Oral; E = Exhibit

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