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April 15, 2011

Cartwright Center

8:30 a.m.-1:30 p.m.

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Dear Friends:

We're pleased that the University of Wisconsin-La Crosse is holding its Fourteenth Annual Celebration of Student Research and Creativity on April 15, 2011. UW-La Crosse takes great pride in providing its undergraduate and graduate students opportunities to engage in faculty mentored research and creativity in diverse academic disciplines. Celebration is a time to publicly acknowledge and congratulate all student scholars and their faculty mentors for their scholarly contributions. As a Teacher-Scholar, I know full well that every abstract in this publication represents serious commitment and hard work on the part of its authors, and they deserve our appreciation for their willingness to share with the UW-La Crosse community.

While research methodology may differ among disciplines; for example designing and conducting experiments; doing computational simulations; pursuing fieldwork and/or creating a work of art, our students are the direct beneficiaries of these distinct learning opportunities through the pursuit of scholarly activities under the guidance of their mentors. UW-L is committed to all forms of research methodologies and is pleased to provide student grants to a number of scholars each year. It



is also worth noting that our student grants have been continually supported by the Academic Initiative program for which students pay a differential tuition. The recipients of these grants in 2009 are acknowledged in this publication, and we congratulate all of them.

I am equally pleased to express my deep appreciation to the members of the Undergraduate Research Committee and the Graduate Council for their assistance in planning this publication and the magnificent event. This year, the UW-L Foundation provided additional funds for the Recognition and Award ceremony which is gratefully acknowledged.

You may recall that we were the proud host of the National Conference on Undergraduate Research (NCUR) at UW-L a few years ago which was, in part, due to our longstanding commitment to student engagement in research and academic excellence. This year, 28 undergraduate students represented UW-L at the 2011 National Conference on Undergraduate Research in Ithaca, NY joined by over 300 students from our sister institutions in the UW System and beyond on two charter flights just for NCUR.

In closing, let me congratulate the student scholars and faculty mentors once again for their hard work and dedication leading to the projects included in the 2011 Celebration of Student Research and Creativity.

Best wishes,

Joe Gow  
Chancellor

## SCHEDULE OF ORAL PRESENTATIONS

	Room 330	Room 331	Room 332	Room 326
<b>8:30 to 8:50</b>	<p><b>UR.1 Philip Strandwitz</b> <u>Microbiology</u> A Co-culture Approach for Identifying Bacteria in the Intestinal Tract of Arion Fasciatus</p>	<p><b>UR.2 Brandon Miles</b> <u>Economics</u> An Economic and Financial Analysis of the United States Ethanol Industry</p>	<p><b>UR.3 Sylvia Weathers</b> <u>History</u> Forty Years Later: The 1968 Edcouch-Elsa, Texas Student Walkout in the Generational Memory of a South Texas Chicana/o Community</p>	<p><b>UR.4 Megan Gosse</b> <u>Sociology and Archaeology</u> Risk and Protective Factors of Juvenile Delinquency</p>
<b>8:55 to 9:15</b>	<p><b>UR.5 Patrick Carthey</b> <u>Sociology and Anthropology</u> House of the People: Worker Solidarity in the Neighborhoods of Cochabamba, Bolivia</p>	<p><b>UR.6 Ryan Haunfelder</b> <u>Mathematics</u> Accuracy of Robust Confidence Interval Methods with Skewed Data</p>	<p><b>UR.7 Ellen Poeschel</b> <u>Modern Languages</u> Exploring Methodologies in Foreign Language Learning Through the Use of Music and Technology</p>	<p><b>UR.8 Xinrui Shi</b> <u>English</u> Beyond Shakespeare: an Oriental reading on Akira Kurosawa's Ran and Throne of Blood</p>
<b>9:20 to 9:40</b>	<p><b>GRAD.1 Bethany Kies and Josh Miner</b> <u>Health Education and Health Promotion</u> Developing Tools, Methods and Procedures to Support Farm to School Program Evaluation in La Crosse County, WI</p>	<p><b>UR.10 Jake Edwards</b> <u>Sociology and Archaeology</u> Self-Control and Violent Offending</p>	<p><b>UR.9 Kelsey Greenwood</b> <u>Psychology</u> Shaken and Moved: Posttraumatic Stress Disorder in Haitian Earthquake Survivors</p>	<p><b>UR.11 Molly Boss</b> <u>Sociology and Archaeology</u> Desistance of Substance Use: Agents of Informal Social Control</p>
<b>9:45 to 10:05</b>	<p><b>UR.12 Melissa Ruplinger</b> <u>Economics</u> Evaluating the Effectiveness of the BioSand Water Filter Program of San Juan del Sur, Nicaragua – A Critical Assessment of Aid</p>	<p><b>GRAD.2 Brittany McIlquhan</b> <u>Health Education and Health Promotion</u> Supporting Supermom: A Needs and Capacity Assessment of Working Mothers at Logistics Health Inc. in La Crosse, WI</p>	<p><b>UR.14 Jill Kotwasinski</b> <u>Sociology and Archaeology</u> Analysis of Stylistic Attributes on Oneota Pottery from the Pammel Creek Site</p>	<p><b>UR.15 Beth Schleicher</b> <u>Modern Language</u> The Representation of Algerian Women in the Works of Malika Mokeddem and Tahar Djaout</p>

<p><b>10:10 to 10:30</b></p>	<p><b>GRAD.3 Nicole Hoffman</b> <u>Education Studies/Biology</u> Upper Midwest Environmental Science Center Sand Prairie as a Model for Identification and Classification of Plants in a Middle School Science Classroom</p>	<p><b>UR.16 Susan Schmidt</b> <u>Sociology and Archaeology</u> Work-Life Conflict: Factors Associated with Negative Spillover from Home to Work</p>	<p><b>UR.20 Beth Lowenstein, Scott Leonard, Lisa Riehle and Stewart M. Spies</b> <u>Nuclear Medicine</u> A Phantom Study to Simulate Half-dose Imaging in Myocardial Perfusion SPECT</p>	<p><b>UR.19 Christopher Jacobs, Antonella Guardiola, Nancy McDonald and Stewart M. Spies</b> <u>Nuclear Medicine</u> Accuracy of PET versus SPECT for Myocardial Perfusion Imaging (MPI)</p>
<p><b>10:35 to 10:55</b></p>	<p><b>UR.17 Katy Christensen</b> <u>Communication Studies</u> Breaking the Silence: Selective Mutism and its Treatment in the High School Setting</p>	<p><b>UR.18 Brian Vanderheyden</b> <u>Health Education and Health Promotion</u> Health Behaviors and Campus Climate Based on College Student's Sexual and Gender Identity</p>	<p><b>UR.21 Leah Mortensen</b> <u>Sociology and Archaeology</u> <u>Educational Studies</u> Integrating Indigenous Knowledge in Education in the Pirwa of Huancarani, Bolivia</p>	<p><b>UR.23 Brianna Marshall</b> <u>Psychology</u> <u>Murphy Library</u> A Century of UW-L Women and The Racquet: 1910-2010</p>
<p><b>11:00 to 11:20</b></p>	<p><b>UR.13 Austin MacKenzie and Carissa Bennett</b> <u>English</u> Good Guy or Bad Guy: Examining Stephenie Meyer's Conception of Edward in Twilight</p>	<p><b>UR.22 Bradley Brunner and Michael Zimmer</b> <u>Nuclear Medicine</u> Patient Risk Associated With Nuclear Medicine Procedures: An Evaluation of Effective Dose</p>	<p><b>UR.24 Elena Bantle</b> <u>Political Science and Public Administration</u> Neighbors of the Future Patagonia National Park: Community Inventory and Recommendations for Outreach</p>	<p><b>UR.27 Christopher Herbst</b> <u>Health Education and Health Promotion</u> A Portrait of Dental Care in Modern Ecuador</p>
<p><b>11:25 to 11:45</b></p>	<p><b>UR.25 Eliana De La Rosa Pichardo</b> <u>Sociology and Archaeology</u> Burial Treatment of Women in Sanisera: Understanding the Cultural Identity of Women in 5th to 7th Century Menorca, Spain</p>	<p><b>UR.26 Andrew Depies</b> <u>English</u> Cognitive Poetics And Metaphor: Broad Reaching Applications As Seen In Three Examples From Shakespeare, Charles Dickens And James Joyce</p>	<p><b>UR.28 Levi Hartman</b> <u>Biology</u> Origins of North American Populations of the Invasive Faucet Snail, Bithynia Tentaculata</p>	<p><b>UR.30 Sarah Malone</b> <u>Sociology and Archaeology</u> How Jimmy Aced His Exam: Theoretical Explanations for Non-Medical Prescription Drug Use on College Campuses</p>

# **UNDERGRADUATE STUDENT ABSTRACTS**

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## UNDERGRADUATE POSTER PRESENTATION ABSTRACTS

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

#### U.1 Factors Affecting Pro-environmental Attitudes

Elizabeth Plombon, Bernadette Taylor and Katie Bauer  
Advisor: Enilda Delgado, Sociology and Archaeology

Using data from the fifth wave of the World Values Survey (2005-2008), this study examined the relationship between affluence, post-materialist values, and pro-environmental attitudes from individuals from Morocco, Uruguay, Sweden, and the United States. Demographic variables were also analyzed to determine which factors were the best predictors of pro-environmental attitudes from each of the four countries. A three step regression procedure was used to test the Post-materialist Value Theory: (A) if an individual's affluence is a significant predictor of their pro-environmental attitudes, (B) if post-materialist values are significant predictors of their pro-environmental attitudes, and (C) whether or not affluence continues to be a significant predictor of their pro-environmental attitudes when simultaneously regressed with post-materialist values. Results demonstrate that affluence is not always a significant predictor of pro-environmental attitudes, and the relationship between affluence and pro-environmental attitudes was not mediated by post-materialist values for individuals from any of the four countries. Also, none of the demographic variables were found to be consistently significant for all four country samples. Therefore, the findings of this study suggest that environmentalism cannot be completely explained by a cultural value shift from materialist to post-materialist, and it appears that pro-environmental attitudes emerge from multiple facets that vary by the society under examination.

#### U.2 The Endangered Species Act and its Impacts on Gray Wolf Recovery in Yellowstone National Park

Katelyn Larsen  
Advisor: Jo Arney, Political Science and Public Administration

Gray wolf recovery in Yellowstone National Park is widely controversial. The species has been delisted and relisted on the Endangered Species Act (ESA) multiple times over the past several years. With no consistency, it is hard to propose an effective management strategy both inside and outside the park. This project argues that relisting wolves on the ESA negatively impacts the policy agenda of managing the wolves. Methods used in this project include a thorough literature review, interviews, and secondary data analysis. The interviews include commentary from key people involved in the wolf project like Doug Smith, leader of the project, and Jim Halfpenny, scientist and naturalist who has written several books about wolves in Yellowstone. Although the issue is still ongoing, this research clearly shows that delisting the gray wolf in the Northern Rocky Mountains from the ESA has a positive effect on overall wolf management.

#### U.3 Exposure to Vinclozolin During Sex Differentiation in Zebrafish Causes a Shift in Sex Ratios

Elizabeth Hicks  
Advisor: Tisha King-Heiden, Biology

Bioaccumulation of environmental contaminants is suspected to be a contributing factor to the lack of sustained natural reproduction of some feral fish populations. For example, exposure to environmental contaminants that block male sex hormones (anti-androgenic compounds) could lead to feminization of males, altered sex differentiation, impaired reproductive behavior, and reproductive failure. Despite the prevalence of anti-androgenic compounds in the environment, we know very little about their ability to potentially affect sex differentiation when fish are exposed as juveniles to sublethal concentrations. Here, we exposed zebrafish to various concentrations of the anti-androgen, vinclozolin (0, 400, 1000, or 2500  $\mu\text{g VZ/mL}$ ) during the period of sex differentiation (23-35 days post fertilization [dpf]). The two higher concentrations caused significant mortality compared with control. There was a concentration-dependent biphasic effect on condition factor (CF) in males with middle concentrations increasing CF of surviving males, while female CF was not affected. At sublethal concentrations, we saw an increase in the proportion of phenotypic females, while surviving fish exposed to the highest concentration of VZ had more phenotypic males. We are currently evaluating gonad morphology to better understand these biphasic results. Pilot reproductive capacity studies suggest that egg production is not impaired; however, fertility may be reduced. Further research is clearly needed to better understand the risks of anti-androgenic compounds to reproductive fitness of fish. Further, since zebrafish are an accepted model for human health and wild fish populations, findings from experiments such as these

can be used to help bridge the gap between ecotoxicological and human health risks of developmental exposure to anti-androgenic compounds.

#### **U.4 Virus Neutralization Antibody Response to Low-Dose Intradermal Vaccination Versus Intramuscular Influenza Vaccination**

Elizabeth Seramur and Katie Bauer  
Advisor: Bernadette Taylor, Microbiology

Influenza virus causes upper respiratory tract infections that can lead to bronchitis and pneumonia. The influenza virus is a pathogen that is highly problematic, in part due to its ability to evolve from year to year and its high transmission rate. Due to costs of influenza vaccines and concerns of shortages, investigators have begun looking at alternate vaccination methods such as the low dose intradermal route. It is predicted that with this vaccination method a comparable, if not stronger, response can be elicited from the immune system due to the fact that there are more immune cells housed in the dermal layer of the skin versus the muscle. In 2004, an influenza vaccine study was conducted at UW-L. The Fluzone® vaccine was given at different doses, and by two different routes, low-dose intradermally at 1/5 and 1/25 of the standard dose, and standard-dose intramuscularly. Serum samples were collected pre- and four weeks post-vaccination for analysis of antibody response. This study aims to assess whether or not low dose intradermal vaccinations provide effective antibody responses in comparison to intramuscular vaccination. The goal is to assess whether or not the low-dose vaccination method elicited an immune response comparable to the widely used intramuscular shot by using the plaque assay technique. In order to utilize the plaque assay, viable virus is needed. Influenza neuraminidase enzyme assays were performed on influenza virus samples that were stored at different temperatures to determine the best storage condition that gave the highest concentration of viable virus for the longest period of time. The next objective was to establish a reproducible plaque assay as a method to standardize virus concentration. This was conducted with different stock virus dilutions to determine a dilution that yielded countable plaques; countable plaques are needed to calculate virus concentration. Results from the viral neuraminidase assays showed the optimal storage condition for the virus is -80° C. Plaque assay results illustrated that the optimal dilution for countable plaques was 10<sup>-3</sup>. Future work will involve using the plaque reduction neutralization test to detect and determine the titer of virus-neutralizing antibodies in serum samples of all three vaccination groups.

#### **U.5 Fibrinolysis of Blood Clots Is Increased During Hibernation In Ground Squirrels**

Gaelle Talhouarne  
Advisor: Scott Cooper, Biology

How can something be essential for survival yet at the same time lethal when unstable? Blood clotting is a phenomenon that has medical interest because it is necessary for healing, but also has the potential to cause health problems such as stroke or heart attack. During hibernation, blood flow slows dramatically, putting animals at risk of forming blood clots. One adaptation would be to break these clots down by activating a process called fibrinolysis. We are studying the regulation of fibrinolysis during hibernation using 13-lined ground squirrels. In fibrinolysis, tissue plasminogen activator (tPA) cleaves inactive plasminogen into plasmin, an enzyme that breaks down the clot. The activation of plasminogen by tPA is blocked by the inhibitor plasminogen activator inhibitor (PAI-1). Moreover, plasmin can be inhibited by alpha2-antiplasmin (alpha2-AP), and either inhibitor would cause fibrinolysis to slow down. By comparing plasma samples from hibernating and non-hibernating animals, it was deduced that fibrinolysis is activated during hibernation. Plasminogen, PAI-1, and alpha2-AP levels are all higher in non-hibernating ground squirrels, suggesting that during hibernation, these proteins are either being consumed or have reduced expression. Current research is focusing on measuring expression level of these proteins. Another possible adaptation in hibernating animals would be the formation of weaker clots. Atomic Force microscopy will be used to quantify the density of the fibrin mesh formed in both hibernating and non-hibernating samples of plasma. This research could ultimately be used to find a new drug to prevent or treat strokes.

#### **U.6 Piecing Together the Puzzle: The Construction of the Attitudes Toward Autism Scale**

Luci Flood and Amanda Bulgrin  
Advisor: Betsy Morgan, Psychology

Our study focuses on revising the Autism Attitudes Inventory (AAI) to gain knowledge of college student's attitudes toward autism. To achieve this we have removed and added some items from the AAI based on expert and student review during our pilot study to create our ATA (Attitudes Toward Autism scale). Many items were poorly worded,

i.e. “Individuals with Autism display “flapping” behaviors”, while others needed more clarification, “All people with Autism have strange behaviors.” Our study uses two sets of participants. One set consists of 400 undergraduate psychology students from the University of Wisconsin-La Crosse. The other set consists of 35 employees from Easter Seals Respite Camp and Chileda Inc. The first set will complete the ATA. After completion, participants will be given the option to participate in completing the ATDP (Attitudes Toward Disabled Persons) and the DA-IAT (Disabilities Implicit Association Test) online at a later date. After completing the questionnaires, participants will be given the option to volunteer with people with autism. This will measure participant’s behavioral intentions. Finally the employee set will complete the ATA and the ATDP. We hope that this sample will establish the construct validity of the ATA. Through our research we hope to find a correlation in scores on the ATDP, DA-IAT, and the ATA. In addition we hope to find a correlation between the scores and behavioral intention task. We also hope to find the highest correlation in scores among the employee sample. Our research is important because, scale development is an important component of psychological research and crucial to establishing the reliability and validity of measures (Robinson, Shaver, & Wrightsman, 1991). Our research focuses on establishing content validity, which is a key component to scale development. Through developing and validating our scale we hope to provide insight into college student’s attitudes on autism in order to assist in increasing awareness and education.

## **U.7 Stability Devaluation of [18F]FDG at High Radioactive Concentrations**

Katherine Martin, Leah Walters and Mark Jacobson  
Advisors: Jeff Bryan, Chemistry; Elton Mosman, Nuclear Medicine Program Director, Mayo Clinic;  
and Joseph Hung

The study's objective was to determine the concentration of ethanol, a radiolytic stabilizer, needed to maintain stability for 12 hours at [F-18]FDG concentration of 19.7-22.6 GBq/mL at end of synthesis (EOS). F-18- was formed by the O-18(p,n)F-18 reaction on a PETtrace cyclotron (GE Healthcare, Milwaukee, WI). [F-18]FDG was synthesized using the FAST lab platform (GE Healthcare). The final product was formulated in 15 mL citrate buffer. Synthesis took 22 minutes delivering up to 336.7 GBq of [F-18]FDG at EOS. Six runs (19.7-22.6 GBq/mL) were completed. Two runs were doped with 0.1% ethanol, three with 0.2% ethanol, and one with no ethanol added. Radiochemical purity (RCP) testing occurred at about 1 hour increments over a 12-hour period. RCP was found by radio-thin layer chromatography (TLC) using aluminum backed silica gel plates and acetonitrile and water 90:10. A FDG standard of 1 mg/mL confirmed radiochemical identity. TLC plates were analyzed with radio-TLC using a  $\beta$ -detector. Residual solvents were tested at about 1 hour increments using gas chromatography (GC) with flame ionization detection and a capillary column. Other quality control (QC) measurements done were pH and appearance. The two runs doped with 0.1% ethanol failed RCP after 5 hours. The three runs conducted using an ethanol concentration of 0.2% maintained stability through 12 hours. For these runs, the radiolytic impurities stabilized at  $6.1 \pm 0.7\%$  after 3 hours. The run using no ethanol failed RCP at 1 hour. pH Varied between 5.3 and 6.1. Visual inspection was clear and particulate free. For the runs with 0.2% and 0.1% ethanol, the residual solvents were  $0.21 \pm 0.02\%$  and  $0.10 \pm 0.02\%$ , respectively. With the addition of 0.2% ethanol to [F-18]FDG with 19.7-22.6 GBq/mL at EOS kept stability through 12 hours. Each of 3 tested runs passed all stability parameters related to radiolysis.

## **U.8 Primate Encounter Rates in the Wehea Protected Forest of East Kalimantan, Indonesia (Island of Borneo)**

Kara Norby  
Advisor: Rob Tyser, Biology

Primates in Eastern Borneo are largely unstudied and have great value for advancing our understanding of anthropology and primate biology. However, before studying primate social behavior, which requires encountering their social groups, or individuals in the case of orangutans, close range must be maintained with the animals in order to habituate them to the presence of humans. Primates were found by searching off-trail as well as by using established trail systems. A GPS device was used to record the number of kilometers traveled each day. Primate encounter rates were calculated for each of the five primate species found in the Wehea Protected Forest using the number of encounters for each species and the total kilometers traveled. This study utilized the encounter rates and other criteria of concern to recommend which species would be the most amenable for future habituation and thus future research. Results showed that Mueller’s Bornean Gibbons (*Hylobates muelleri*) had the highest encounter rate, yet the red langur (*Presbytis rubicunda*) was the top recommend species since they move more slowly than gibbons and were much easier to follow. Before beginning the long and difficult process of habituation, it is extremely useful to determine beforehand which primate group will habituate with the least amount of time and energy.



## **U.9 Cutting the Fat: A Quantitative Analysis of the Beef Industry**

Kyle Danielson  
Advisor: Rob Tyser, Biology

Beef is shown by many researchers to be one of the least sustainable food products available today. Some farmers have switched to using organic grass to feed cattle in an attempt to create a more sustainable product. This research quantifies energy inputs and outputs of both conventional and organic production methods to predict the success organic farmers could have in producing a sustainable product. Specifically, it tested the hypothesis that there is a negative energy return on corn-fed beef and that there is a positive energy return on grass-fed beef. A Stella simulation model was created to test this hypothesis, and outputs were analyzed to quantify energy returns of both production methods. Primary inputs for this model included (1) yields of 8,456 dry pounds per acre of corn grown conventionally and 1,800 dry pounds per acre of grass grown organically, (2) energy inputs to grow corn and grass were 13.2 gigajoules/acre and 0.037 gigajoules/acre for corn and grass, respectively, (3) a daily 2.5% of body weight consumption rate, (4) conversion efficiencies of 20% for corn and 6.1% for grass, and (5) a butcher-weight of approximately 1,200 pounds. Outputs considered were total amount of energy used and amount of space required. Results showed that corn-fed beef returns only 61% of energy inputs, while grass-fed returns 821%. However, research results suggest that acreage requirements for grass-fed beef are more than seven times that of corn-fed beef. Another implication of this model is that is the length of time necessary to raise a slaughter-weight animal differs considerably between these production options -- 220 days for corn-fed versus 550 days for grass-fed. These results agree with background literature. Further, results support the original hypothesis suggesting that farmers should transition back to an organic grass diet for their cattle.

## **U.10 Investigating Color Intaglio Printmaking in Barga, Italy**

Sarah Higley, Keriann Noga and Heather Johnson  
Advisor: Joel Elgin, Art

In June of 2010, we spent a week traveling through Florence, Italy in order to visit museums, do preliminary research in the form of drawing, and explore the culture. From there, we traveled to Pisa where we attended a drawing workshop which extended into our travels to Barga. While in Barga we participated in an intensive three day workshop with master printmaker Swietlan Kraczyna to learn about color theory in intaglio printmaking. This rare opportunity gave us the foundation of color etching which we took back to La Crosse. We were able to share our knowledge and new perspectives with the printmakers of UW-L throughout the process of our continued research in the print shop. Our research began with basic color studies inspired by the exercises we completed during the workshop. After mastering those techniques we were able to implement the methods with deeper complexity. By combining these new skills with our prior knowledge, we pushed the limits of our potential as artists. As educators, we discovered concepts and processes related to color theory that we will implement into our future classrooms. The resulting artworks demonstrate our growth as both artists and educators.

## **U.11 A Faunal Analysis: The Sanford Archaeological District (47LC394-31)**

Edward Quinn  
Advisor: James Theler, Sociology and Archaeology

This study is an analysis of the animal remains recovered during archaeological excavations conducted in 2004. The excavations were conducted on the South side of modern day La Crosse, WI. By studying reference materials and using comparative bone collections housed at the University of Wisconsin - La Crosse, identification of the animal bones recovered archaeologically can take place. Once the bones have been identified, quantitative data can be calculated. This data will provide insight into the subsistence patterns of prehistoric Native American people who lived in and around modern day La Crosse. Subsistence information will help to piece together a clearer picture of the past life ways of the people who inhabited this area.

## **U.12 Who's To Blame? : Perceptions of Domestic Violence in Biracial Relationships**

Allyson McElligott  
Advisor: Bianca Basten, Psychology

Domestic violence is a preventable public health concern that affects individuals world-wide. In the United States, one in four women report experiencing domestic violence. However, a report recently issued by the Centers for Disease

Control and Prevention (2009) indicates that current statistics underestimate the problem. In many domestic violence cases, observers have a tendency to blame victims for their abuse. Factors influencing victim blame include gender, ethnicity, and sexual orientation of the victim, as well as those of the perceiver; additional factors include attitudes about women and previous experience with violence (Reddy et al., 1997). Domestic violence is not limited to one ethnicity or to same-race couples, and while some studies have investigated these issues, attention has only been paid to certain ethnicities. This study investigated perceptions of domestic violence victims in mixed-race relationships, specifically focusing on Hispanic and Caucasian mixed-race couples. Eighty participants were randomly assigned to one of four conditions, each reading a vignette depicting a domestic violence case. The race of the perpetrator and the victim was manipulated while the gender of both remained constant. A modification of the Domestic Violence Blame Scale (Petretic-Jackson, Sandberg, & Jackson, 1994) was used to assess the perceptions of the victim and the perpetrator in the vignette. Participants also completed a questionnaire assessing their attitude towards women and provided basic demographic information. It was predicted that participants would place the highest amount of blame on the victim when the violence was perpetrated by a Hispanic man on a Caucasian woman. Additionally, participants were predicted to place a higher amount of blame on victims in mixed-race relationships. Data collection will be completed shortly. Preliminary results appear to support the hypotheses.

### **U.13 Purse-String Contraction Observed in Fish Cell Culture**

Evan Plum  
Advisor: David Howard, Biology

Purse-string contraction has recently been discovered as an important cellular process that allows for rapid healing of small wounds (less than eight cells). Cells surrounding the wound create an intercellular ring of actin and non-muscle myosin II (NMII) which contracts to rapidly close the wound without the need for new cell growth. This type of wound healing has potential impacts on health research because it may be a way that blood vessels heal without forming clots. Also, the same process is utilized by cells in many key events early in embryonic development. The project had two main objectives. One, to determine if the fish cell line CHSE-214 performed the same mechanism of purse-string wound healing as previously recorded in other mammalian cell lines such as MDCK. This goal is important in determining if other vertebrates perform this process or if it is restricted to mammals. Also, it will open up more cost effective avenues for research because the CHSE-214 cells are cheaper and easier to culture than mammalian cells. The second goal was to determine which type(s) of NMII is involved in purse-string contraction. Three different types of NMII exist within mammalian cells: Type A, B, and C. These three types are genetically and structurally different, but very little is known about which type participates in which cellular functions.

### **U.14 Evaluation of Compatibility and Stability of Filtered Tc-99m Sulfur Colloid When Combined With Indocyanine Green Dye**

Amy Warren, Karissa Hegseth and Thomas Herold  
Advisors: Jeff Bryan, Chemistry and Elton Mosman, Nuclear Medicine Technology Program at Mayo Clinic

It is a common practice to administer dyes and radiopharmaceuticals separately for the localization of sentinel nodes in patients with biliary tract malignancies. The objective of this study is to evaluate the chemical properties and particle size of filtered Tc-99m sulfur colloid (FSC) before and after it is combined with indocyanine green for injection, USP (IG). Also, evaluate the compatibility and stability when combining the two for a single injection. Methods: FSC (Pharmalucence) was prepared according to the package insert and the final preparation was filtered through a sterile 0.2µm filter. The IG dye (Akorn, Incorporated) was also prepared as per package insert. In a sterile syringe, 0.25mL of 14.8MBq (400µCi) FSC was mixed with 0.25mL of 1.25mg IG dye in a 1:1 for a total solution volume of 0.50mL. The radiochemical purity (RCP) and pH values of FSC were obtained immediately, and at 1 and 2 hours post-preparation. Particle size was analyzed using an electron microscope (FEI Tecnai 12 TEM, FEI Company) immediately and at 2 hours. In addition, bacterial endotoxins and sterility were tested at two hours post-preparation with the Endosafe PTS 100 (Charles River Laboratories). Results: The average RCP value was 97.6±2.2% (n=24). The average pH value was 5.47±0.29 (n=24). Evaluation of the particle size of FSC with IG dye was determined by electron microscopy to average 62±30nm (n=271) at zero hour and 71±34nm (n=215) at two hours. This was compared to FSC without IG dye to average 71±41nm (n=41). Measurements of unfiltered Tc-99m SC were recorded at 253±192nm (n=21) for additional comparisons. All two hour samples passed bacterial endotoxins and sterility tests. Conclusion: The chemical properties and particle size of FSC were not impacted by the addition of IG, and thus it is suitable to combine FSC and IG in the same syringe for administration.

#### **U.15 Perceptions of a Recurring Event Held at a Non-traditional Location**

Rebecca Reed

Advisor: Gretchen Berns, Recreation Management and Therapeutic Recreation

This project analyzed the effect of moving an event, the Irish Student Trampoline Open, from its traditional location in the Republic of Ireland to Northern Ireland for the first time. The specific research focus was on participants' perceptions of moving the event and their loyalty to the event. To acquire data from members of the Stirling University, Trampoline and Gymnastics Club were interviewed both prior to and during the Irish Student Trampoline Open. Also, brief written surveys were given to participants from a variety of teams at the event.

#### **U.16 Knowledge of and Adherence to Breast Cancer Screening Guidelines in Hodgkin Disease Survivors Treated with Mantle Radiation**

Melissa Meinking, Vicki McHugh and Michelle Mathiason

Advisor: Leah Dietrich, Gundersen Lutheran

Female Hodgkin Disease (HD) survivors treated with mantle radiation have a 3-10 times greater risk than the general population of developing breast cancer. Of these women, 40% are unaware of their increased risk and receive follow-up care solely with a primary care provider (PCP) and may not receive the National Comprehensive Cancer Network (NCCN) recommended follow-up. Our objective was to assess the knowledge of PCPs within the Gundersen Lutheran Health System (GLHS) toward breast cancer screening recommendations in this population. Methods: A review of medical records (MR) of female HD patients treated with mantle radiation from 1980-2005 was completed to assess follow-up care and development of secondary cancers. Cancer and survival rates were calculated using Kaplan-Meier statistics. An email survey assessing knowledge on care for HD survivors was distributed to GLHS PCPs. Results: MR review of 61 patients found a mean age of diagnosis for HD of 34±18 years (range, 6 to 82 years). Only 2 patients (3%) had received a breast MRI in follow-up. Of those with >5 years of follow-up, 5 (23.5%) were diagnosed with breast cancer within 20 years post-radiation. A survey of 87 PCPs found that 61% were aware that HD survivors had an increased risk of breast cancer, but only 36% were aware of the complete recommended follow-up and 66% stated they were "uncomfortable" treating female patients with a history of HD. Fewer than 50% of PCPs who care for female patients with HD inform these patients of their increased risk. Conclusions: We confirmed a high rate of breast cancer in female survivors of HD and lack of compliance with breast cancer screening guidelines. Survey data showed that GLHS PCPs had average knowledge of the increased risk of developing breast cancer and limited knowledge of the NCCN breast cancer screening guidelines in HD survivors.

#### **U.17 Minimizing Human Error in Radiopharmaceutical Preparation & Administration Via A Barcode-Enhanced Nuclear Pharmacy Management System**

John Hakala

Advisors: Jeff Bryan, Chemistry and Elton Mosman, Nuclear Medicine Technology Program at Mayo Clinic

The objective of this project is to insure correct radiopharmaceutical administration through the use of a barcode system that links patient and drug profiles with the on-site information system. This system minimizes the amount of manual human manipulation which has proven to be a primary source of error. The most common reason for a dose misadministration is improper patient identification when obtaining a dose from the nuclear pharmacy, or at the site of administration. A standardized electronic transfer of information from radiopharmaceutical preparation to patient injection will further reduce the risk of misadministration. A value stream map showing the flow of the patient dose information, as well as the actual patient dose, was documented. Next, a future state map was created which identified the critical sites that have been shown to be the most common locations of error. Transitioning the current process to the future state will require the implementation of solution methodologies that address the sites of error. To optimize the future state process, a barcode system that links the on-site radiology management system with the nuclear pharmacy management system was proposed. A bar-coded wristband connects the patient directly to the electronic information systems. The new barcode-enhanced process linking the patient dose with the electronic information reduces the number of crucial points for human error, and provides a framework to insure the prepared dose reaches the correct patient. Although the proposed process flow has specifications designed for a site with an in-house central nuclear pharmacy, much of the information framework could be used by nuclear medicine facilities using unit doses. The creation of an electronic connection between management information systems to allow the tracking of a radiopharmaceutical from time of preparation to administration can be a useful tool in preventing mistakes that are an unfortunate reality for any facility.

## **U.18 Bubbles in the Sky: Studying Neutral Hydrogen Shells in the Interstellar Medium**

Elizabeth Tennyson  
Advisor: Shauna Sallmen, Physics

One of the many processes that occur in our Milky Way Galaxy is the interaction of Neutral Hydrogen (HI) shells with the Interstellar Medium (ISM). The ISM is the non-uniform, low density matter that exists in the space between the stars. HI shells are formed when material from stellar winds and / or supernova explosions expands outward and mixes with the ISM. Without this phenomenon the heavy elements made in stars would not be recycled and reused for future star and planet systems; this picture is the key to the Earth's existence. The goal of this project is to better understand how interstellar shells evolve. To try and acquire a better grasp of a shell's characteristics and development, we compared images for one hundred shells based that were discovered in the Search for Extraterrestrial Neutral Hydrogen (SETHI) radio database. The SETHI images show cold, neutral gas, the H-Alpha Composite Survey images show warm, ionized gas, the IRIS (infrared) images show warm dust, and the RASS (X-ray) images reveal hot gas. The initial comparison identified shells suitable for more detailed follow-up study. We will present a catalog of shells which were classified as likely targets. Such detailed multi-wavelength comparisons can give us estimates on a shell's age and evolutionary status.

## **U.19 Grassroots Organizing and Activism: Information Resulting from Participating in Feminist Winter Term 2011**

Megan Woodward  
Advisor: Mahruq Khan, Women's, Gender, and Sexuality Studies

This research study attempts learn what different organizations in New York City are doing to promote grassroots organizing and activism, as well as what tools exist for undergraduate and graduate students to become activists in their own communities and in their future employment. Research was conducted in a participant observation format with the leaders of various feminist organizations affiliated with Soapbox Inc.

## **U.20 Analysis of Oneota Storage Pits at the Lower Sand Lake Site (47Lc45-3)**

Lindsey Schweitzer  
Advisor: Constance Arzgian, Mississippi Valley Archaeology Center

My research focuses on the examination of Oneota storage pits from locality 3 at the Lower Sand Lake site (47Lc45) which was excavated in the Summer of 2009. Seven features were identified as storage pits and analyzed in the research based upon their depth. Radiocarbon dates were done on two pits to confirm they were from the same occupation. The volume of pits were calculated to get the storage capacity. The number of bushels of corn was then calculated from that to help figure out how much corn could have been stored. Nutritional facts, specifically calories and protein, on dried corn and typical corn meals based on ethnographic and archaeological studies were used to propose the possible number of people a certain amount of stored corn could have fed for a given length of time. This research will add to our understanding of the Oneota population.

## **U.21 Decomposition of Noise Contributions in QDOGFET Single-Photon Detectors**

Sean Harrington  
Advisor: Eric Gansen, Physics

Detecting individual photons of light is of growing importance in quantum information technologies. Traditional single-photon detectors (SPDs) such as avalanche photodiodes are single-photon sensitive but cannot distinguish between the detection of one and more than one photons that arrive simultaneously. So-called, photon-number-resolving (PNR) detectors are a key enabling technology for linear-optics quantum computing, impact the security of quantum communication systems, and are important tools for studying the quantum nature of light. The QDOGFET (quantum dot, optically gated, field-effect transistor) is an innovative detector that utilizes semiconductor quantum dots embedded in a high-electron-mobility transistor. Previous studies have demonstrated that QDOGFETs exhibit PNR capabilities; however, these measurements were performed at low-detection rates (10 Hz) and at an operating temperature of 4K where thermally activated noise sources are minimized. Real-world applications demand MHz detection rates and much higher operation temperatures. Fundamental to detecting individual photons is differentiating the weak, photo-induced signals from random fluctuations associated with electrical noise. Here, I present the results of

a systematic study of the noise spectra of QDOGFETs as a function of sample temperature. Observed in the noise spectra are Lorentzian-shaped noise features riding on top of a dominant background that is inversely proportional to frequency. I use the temperature dependent behavior of the Lorentzian and 1/f noise components to identify the dominant noise mechanisms in QDOGFETs and determine how the electrical noise ultimately limits the operating temperature and detection rate of these devices.

## **U.22 Using Zebrafish to Screen for Developmental Toxicity of Emerging Organic Contaminants**

Jenna Weigand

Advisor: Tisha King-Heiden, Biology

There is growing interest regarding the potential ecotoxicological impacts resulting from the widespread contamination of aquatic ecosystems with emerging organic contaminants (EOCs) such as pesticides and personal care products. Those that are endocrine disruptors are of particular concern because even trace amounts can disrupt embryonic development and reproduction in aquatic species. The pesticide vinclozolin (VZ) and biocides triclosan (TCS) and triclocarban (TCC) are examples of EOCs with known biological effects, but limited information regarding their potential ecotoxicity. VZ is a known anti-androgen, and in vitro studies suggest that TCS is estrogenic, and that TCC is an androgen enhancer. Zebrafish were chosen to screen for developmental toxicity of these EOCs because they require little maintenance, and are easy to manipulate and observe in laboratory studies. Zebrafish were exposed to various concentrations of each contaminant via static, waterborne exposure during early development (0-5 days post fertilization, dpf). Fish were evaluated daily for survival and overall health, and cumulative toxicity was quantified at 5 dpf. Our results indicate that VZ, TCS, and TCC have no effect on hatching; however, developmental toxicity was observed at sublethal concentrations. Initial assessments of contaminant stability under experimental conditions are being conducted to better interpret biological effects. Further, we are currently developing fate and transport studies that can be used in conjunction with these chronic toxicity assays so that we can better predict the potential ecotoxicological risks of these EOCs.

## **U.23 The Italian Renaissance: The Blending of Art and Science**

Jessalyn Kimball and Brittany Vogt

Advisor: Joel Elgin, Art

As artists with scientific backgrounds, we traveled to Italy to study works and through firsthand experience discover why it became the birth of the Renaissance, where the combination of art and science first occurred. While in Italy, we worked closely with a UW-L Alum who hosted a drawing workshop in Florence and guided us in our research to noteworthy museums. We have expressed what we learned through our own collections of prints and drawings.

## **U.24 The Effect of Time of Day on Power Output Performance**

Sarah Stump and Stephanie Kulow

Advisor: Scott Doberstein, Exercise and Sport Science

Every athlete varies slightly, specifically in the routine and the time of day they practice and compete. Most athletes have rather consistent competition times, however if these times are advantageous for maximal performance is another question. This study investigated the effects of time of day on power output performance. Fourteen college track and field athletes between the ages of 18-25 were recruited for this study. For three consecutive weeks, participants reported for testing, once each at 6am, 3pm, and 11pm. At each testing session, participants completed a five minute dynamic warm-up. After their warm-up, participants were asked to complete three standing broad jumps, of which their average was recorded. Between each jump participants had approximately two minutes rest. The data collected were analyzed using paired t-tests. We can report with 95% confidence that, when tested, subjects will jump between 4.8cm and 16.9cm farther at 3pm. When comparing 3pm to 11pm, we did not find enough evidence to prove a significant difference in power output. With these results, we conclude that power output is higher in the afternoon and evening than in the morning.

## **U.25    **Toward a New Model for Autoimmune Disorders: Bimodal Parasite Therapy in Systemic Lupus Erythematosus (SLE)****

Katie Josephson and Rourke Decker  
Advisor: Greg Sandland, Biology

The use of sanitary chemicals and sterile techniques in Westernized countries has greatly reduced human mortality from infectious disease. However, this positive outcome has coincided with a rise in autoimmune diseases—degenerative conditions in which the human body loses the ability to distinguish between “self” and “non-self” and consequently attacks its own cells and tissues. Systemic lupus erythematosus (SLE) is an autoimmune disorder that can have devastating effects on virtually every system in the body, with women—particularly Hispanics, Asians, and African Americans—comprising the overwhelming majority (92%) of patients. Epidem-iological research demonstrates that populations infected with intestinal parasites have significantly lower rates of autoimmune disease. Helminthic therapy is a novel treatment modality that seeks to exploit this fact by deliberately infecting patients with intestinal parasites. Though helminthic therapies have been used successfully to treat a number of autoimmune disorders, they have not yet been attempted with SLE. We propose to treat a strain of male mice predisposed to SLE (MRL/MpJ-Fas/J), which has a drastically diminished lifespan, with two types of parasitic worms: *Schistosoma mansoni*, a bloodborne parasite, and *Heligmosomoides polygyrus*, an intestinal parasite. Our study will be the first ever to simultaneously test the effectiveness of two helminthic therapy modalities against the same autoimmune condition in a single organism. We predict that these treatments will prolong the lifespan of male MRL/MpJ-Fas/J mice by slowing or even reversing progression of the disease.

## **U.26    **The Impact of Horses on Celtic Society****

Lisa Jennings  
Advisor: Joseph Tiffany, Sociology and Archaeology

Based on archaeological evidence, horses have been utilized initially as a food source by humans since the Upper Paleolithic. It was not until c. 2500 B.C. when horses in this area were domesticated for draft animals and other purposes. With the domestication and utilization of the horse a shift in how different societies performed certain aspects of their lifeways would be drastically changed. This paper will be looking at the Celtic Civilization to address the impact of horses on Celtic society. The impact of horses on Celtic life will be measured by looking at three key aspects warfare, religion, and the maintenance of social structure. Examining these three aspects will lead to an understanding on how much the impact of horses can have on Celtic life.

## **U.27    **Investigating Freedom of Press and the Empowerment of Women: A Global Analysis****

Karen Epp  
Advisor: Nabamita Dutta, Economics

“A free press plays a key role in sustaining and monitoring a healthy democracy, as well as in contributing to greater accountability, good government, and economic development,” according to Freedom House. The research question I am investigating is “can freedom of the press improve women’s rights?” Using data from the World Bank, FreedomHouse.org, and Cingranelli-Richards (CIRI) Human Rights Data Project, I am looking for a correlation and possible causation between freedom of the press and women’s rights. Based on my literature review, I hypothesize that there is a positive correlation between the two variables on a global level. A free press allows readers to make informed job-related, financial, and voting decisions. A free press fosters growth and stability within a country, whereas countries with a state-controlled media sectors suffer from higher levels of corruption, poverty, and infant mortality rates. While controlling for other variables affecting women's rights, I am running a model that isolates the effects of press freedom on women’s empowerment to the best of my ability. My findings may have profound policy implications, especially because research on this particular topic has not been widely published. Among other efforts to improve women’s rights, the United Nations might consider these findings a useful tool for empowering women on a global level. This research project would not be possible without the guidance and support of Dr. Nabamita Dutta. Thank you!

## **U.28 Sprout Dynamics of American Chestnut Trees**

Kari Soltau  
Advisor: Anita Baines, Biology

Chestnut blight is viewed as a classic example of the severe impact an introduced pathogen can have on its host. The introduction of chestnut blight in the early 1900s severely damaged American chestnut populations causing major economic and ecological impacts. Research has focused on the biological control aspects of the American chestnut-chestnut blight interaction. However, few studies have investigated the basic ecology of the system. The effects of chestnut blight on individual American chestnut sprout growth and survival is a major gap in our understanding of this interaction. Analysis of a long-term American chestnut data set and an empirical study of sprout dynamics in WI and MI American chestnut sites were used to evaluate the success of biological control efforts of chestnut blight.

## **U.29 Stepwise Approach Towards Multifunctional Molecule-Based Materials**

Tanner Culpitt  
Advisor: Kendric Nelson, Chemistry

As the electronic and computing industries are reaching the physical limitations of size reduction to obtain smaller and faster components the search for a new class of materials that could revolutionize these industries is currently under investigation. A proposed solution involves the opposite approach of starting with something small and selectively building up desired assemblies from molecules/molecular precursors. This approach allows one to carefully choose molecular precursors (with desired chemical and/or physical properties) and selectively link two or more of these discrete precursors together. Incorporating two or more of these discrete molecular precursors into desired molecular assemblies has the potential to yield new materials that exhibit various degrees of multifunctionality. Multifunctional materials have potential uses in the areas of catalysis, drug delivery/biomedicine, sensors, and in the electronic/computing industries. The focus of our study is on the use of 4',5'-diaz-9'-[4,5-bis(alkylthio)-1,3-dithiol-2-ylidene]fluorene (dbdyf) based ligands (where alkyl = methyl, ethyl, or ethylcyanide) to discretely link two different first row transition metal complexes (TMCs) together. The reaction of [(TPyA)Co(NCMe)<sub>2</sub>](SbF<sub>6</sub>)<sub>2</sub> [TPyA = tris(2-pyridylmethyl)amine] with 4',5'-diaz-9'-[4,5-bis(alkylthio)-1,3-dithiol-2-ylidene]fluorene (where alkyl = ethyl) in acetonitrile (MeCN) forms [(TPyA)Co(dbdyf)](SbF<sub>6</sub>)<sub>2</sub>•2MeCN•0.25Et<sub>2</sub>O (1). The structure of 1 was characterized via single crystal X-ray diffraction and supported through various spectroscopic techniques (i.e. IR, UV-Vis, etc.). This molecular precursor is to be reacted with a second TMC, [(TPyA)M(NCMe)<sub>2</sub>](SbF<sub>6</sub>)<sub>2</sub> (where M ≠ Co), to form a heterobimetallic dinuclear complex. The presence of multifunctional chemical and physical properties will be investigated. These discrete dinuclear complexes are the first step in ultimately designing new materials that exhibit multifunctionality with potential applications in numerous technological areas (vide supra).

## **U.30 Lighting: A London Study of Professional Theatrical Lighting for "Lend Me a Tenor, The Musical"**

Justin Schmitz  
Advisor: Amanda Hart, Theatre Arts

This grant will assist in the funding of an international trip and Independent Study tour to London, England to study and research a lighting designer's work in a West-End theatrical setting by partnering with "Lend Me a Tenor – The Musical." In London. The project will culminate in a final presentation in the Toland Theater that will display and re-create the techniques that the London production of "Lend Me a Tenor – The Musical" has used, and also display safe atmospheric levels for use in theatres. I will be researching technologies that we currently do not utilize here at UW-La Crosse, and research the functionality and versatility of new equipment and technology for our use in future productions and in educating students so they may have more technological experience prior to graduation

## **U.31 A Spatial Analysis of Craft Activities at Johnson's Island Military Prison**

Samantha Sharp  
Advisor: David Anderson, Sociology and Archaeology

Johnson's Island Military Prison is located on Lake Erie outside of Sandusky, Ohio, and housed Confederate Officers as prisoners of war. During their time in captivity, these men occupied themselves in various ways, including the formation of a theatre troupe, the designing of escape attempts, journaling, playing cards, and crafting trinkets out of bone, shell, and hard rubber. The remains of these trinkets and the raw material from their manufacture appear

frequently in the archaeological record of the site. The bountiful data regarding the craft activities has been collected but not analyzed until this study. The object of this investigation is to observe the artifact density of hard rubber and shell artifacts both separately and in conjunction with each other to draw conclusions regarding the daily lives at Johnson's Island, with the possibility of also comparing these results with the craft remains at other Civil War prison sites. In order to approach this project, artifact densities were mapped and the location and number of artifacts in excavated units and features at the site were compared. By exploring the craft activities at this prison, the investigation hopes to provide important knowledge regarding the daily lives of prisoners at this site and others, and to add to existing knowledge of Civil War prisons and their captives.

### **U.32 Public Health Care for Adolescents in Coastal Ecuador**

Emily Bergman

Advisor: Darlene Lake, Modern Languages

Teenage pregnancy is a dangerous, yet prevalent, problem that has been occurring continuously in many countries all over the world. The purpose of this particular study was to examine the possible causes for this problem in a small town along the western coast of Ecuador. The distant medical facilities, lack of education, lack of availability of contraceptives, and the Ecuadorian culture were all possible explanations for the increased amount of teenage pregnancies. The young women in Bunche, Ecuador have to travel quite a bit for medical treatment as there are no health care facilities located in their town, and the closest hospital is about a 20 minute drive away. In Bunche, it is rare to find a young girl above the age of 16 that hasn't already given birth to at least one child. This trend was displayed in every generation. I conducted numerous interviews with women of varying ages in the village, and a hospital administrator about their feelings on this pressing issue, and possible explanations for this sexual behavior at such a young age. Through all my interviews, I discovered that adolescents in Bunche are taught about the dangers of unprotected sexual intercourse and where they can find contraceptives, but in Bunche, family is more important than education. The majority of adolescent girls start a family instead of continuing with their education. /

### **U.33 The Effects of Altering Songs on Likeability: A Mere Exposure Study**

Jeff Siegenthaler

Advisor: Alexander O'Brien, Psychology

Familiarity has long been linked to people's likeness of various stimuli; this phenomenon is known as the mere exposure effect. However, there has been a relatively small amount of research which has dealt with the generalizability of the mere exposure effect. The research that has been done has provided varying results, with no studies found which used slightly altered auditory stimuli. This research focused on these previously overlooked topics by altering music with which participants had become familiar. Sixty participants listened to and rated song clips that were approximately twenty seconds long, and the genres included were pop, rock, and country, as these are common amongst college students. Songs were altered at various points throughout the study to determine how the likeness of unaltered song clips transferred to the altered ones at varying levels of exposure. Clips were altered by changing the pitch or the lyrics, and ratings were compared to both novel and unaltered songs. Results were significant at the .05 level; most notably, verse change songs were rated significantly higher than unaltered songs on three exposures (14,17,18) and significantly higher than novel songs on exposures 12 through 18. Pitch altered songs did not produce a similar effect, likely due to it being a more extreme change in the song with which most people are not familiar (i.e. people are used to hearing changed lyrics in the second verse, not a changed pitch). Unaltered songs were consistently rated significantly higher than novel songs on exposures 7 through 13, but not exposures 14 through 18. This was as expected due to the mere exposure curve. Overall, these results give substantial evidence to support the existence of the generalized mere exposure effect which can help further the research of this topic in the future.

### **U.34 Assessment of High School Coaches' Knowledge on the Female Athlete Triad**

Natalie Kramer

Advisor: Kari Emineth, Exercise and Sport Science

High school coaches are often the primary supervisors of athletes during athletic participation leading them to also be responsible for the athlete's well-being during this participation. The objective of this research was to obtain a better understanding of high school coaches' knowledge on the female athlete triad in the area of recognition, management, and prevention. A cross-sectional survey was administered utilizing an online survey instrument. Participants included 67 female-sport coaches representing 13 sports (both high and low risk) in southwest Wisconsin and southeast



Minnesota. Demographic variances of coaches analyzed were gender, past experience with the female athlete triad, experience coaching high-risk sports, and total years of coaching experience. The outcomes measured consisted of a total score of 50, which was separated into prevention (16), management (18), and recognition (16) section scores. The highest scores were found in management knowledge (81%) and the lowest scores were found in recognition knowledge (69%). Coaches with experience coaching high risk sports scored significantly higher on the recognition section than coaches who did not have experience coaching high risk sports ( $p=.027$ ). The results of this study show that further development and refinement of coaching education is needed in the area of female athlete health. This is especially important in the high school setting where a certified athletic trainer is not always available leaving much of the responsibility of athlete well-being during athletic participation to the coach.

### **U.35 Measuring Monetary Policy Uncertainty and Its Effects on Macroeconomic Outcomes**

Nicholas Herro  
Advisor: James Murray, Economics

This paper examines the degree to which past unexpected monetary policy decisions affect output growth, inflation, and unemployment rates. I use forecasts from an estimated empirical Taylor model to obtain market expectations and build measurements of past uncertainty. I find increased uncertainty to have statistically significant, uniformly adverse impacts on these outcomes. Further, I find output, inflation, and unemployment volatility to increase with monetary policy uncertainty. Finally, I conclude that the Fed should attempt to minimize surprise decisions by implementing predictable policy to maximize efficacious outcomes, thus increasing output growth, decreasing inflation, decreasing unemployment rates, and decreasing volatility of these outcomes.

### **U.36 Investigation of Maintenance of the Kinetoplast in *Trypanosoma brucei***

Andrew Barazia and Wesley Bickler  
Advisor: Nicholas Downey, Biology

*Trypanosoma brucei* is a parasite that causes African Sleeping Sickness, a deadly disease that affects both humans and animals around the world. Previous research has shown that the flagellum and associated kinetoplast of this protozoa is a target for potential medications. An elevated level of understanding of this link between the basal bodies of the flagellum and the kinetoplast by localizing associated proteins is the goal of this research. Bioinformatics was used to find proteins that have domains essential to their involvement in this link. These proteins were successfully added to trypanosome cells using the plasmid pLEW and will later be localized using immunofluorescence. RNA interference will also be studied by comparing growth curves of cells that were transfected with a pZJM construct, with and without the inhibited mRNA.

### **U.37 Land Snail Community Diversity in the Driftless Region of Wisconsin**

Rachelle Amundson and Chris Lylum  
Advisor: Kathryn Perez, Biology

The terrestrial snails of North America are a diverse and threatened group, but conservation status of the majority of species is uncertain. There are ~100 species of land snails in Wisconsin and several habitats are known to have globally significant levels of land snail species richness, however, most are minute (<5 mm) and their distributions and ecologies are poorly known. The survey of land snails in the Driftless region, an area free of ice during the last glaciations period, is being done not only to identify the locations of the 21 land snail species of conservation need but also to discover the variables driving land snail diversity and compare these variables in other regions to test the similarities with communities outside of the Driftless area. Georeferenced museum records were used to create a GIS model which incorporated sites with high gastropod richness with environmental information. Areas identified by the GIS model as highest priority were targeted for surveys along with a few low priority areas to ground-test the model. At each site there was a minimum 30 minute visual search for macrosnails and at least 2m<sup>2</sup> of leaf litter were gathered to sieve for microsnails. Environmental data such as slope, ground cover, and canopy cover were taken at each habitat in the site. The leaf litter was washed to remove sediment, air dried, and put through a series of sieves to separate coarse organic matter from the microsnails. After sieving, the litter is searched twice under a low-power dissecting microscope and the snails are collected, sorted, and identified to species. Currently, the dry, fine sediment is being picked through and snails are being identified. These surveys have resulted in discovery of several new populations and a large range extension for a state threatened species *Hendersonia occulta*, the cherrystone drop snail.

### **U.38 Health and Sanitation at York, England**

Lauren Easton

Advisors: David Anderson and Christine Hippert, Sociology and Archaeology

The history of public health is commonly seen as beginning in the 1800's after the industrial revolution, but archaeology has allowed for components of public health to be examined for populations that existed well before the 1800's. Waterlogged soil has led to deposits of organic material to be recovered from York, England—a site that has been occupied for over 6,000 years. Both the organic and inorganic artifacts along with the skeletal remains from the site have allowed for the reconstruction of daily life which allows us to examine past health issues. This study will use data from Roman, Viking, and Medieval occupations of the site in order to better understand the water supply and the treatment of parasitic infections during each different occupation. In order to address how the health and sanitation changed over time, a data set composed of both direct and indirect evidence will allow for a comparative analysis between each occupation. This study will provide results allowing us to assess the extent to which the state was involved in ensuring the health of the community, as well as the way parasitic infections were treated during the different occupations of the site. The information may then add to our understanding of public health today because we will be able to see how it differs from past views of state involvement in community health practices and we will have more evidence suggesting that human health has been a concern of the state for thousands of years and should continue to be a concern of the state.

### **U.39 Identification and Analysis of the Usage of Fresh Water Mussels from the Glenwood Locality, Iowa**

Lizzy Lamb

Advisors: Joseph Tiffany and James Theler, Archaeology/Sociology

The objectives in this analysis of freshwater mussels were to identify tool types and patterns among three different late prehistoric Glenwood culture sites in Iowa, and to compare these results with a similar site, Wall Ridge, that has already been analyzed. The analysis showed that there were patterns pertaining to what species of shell were used for which tool, and a new tool was identified. This tool may have been used to apply pigment to deer hides. Experimental archaeology was also done to give better insight into the possible functioning of the applicator tools.

### **U.40 Simulating Galaxy Evolution to Further Understand Dark Matter**

Cody Hunt

Advisor: Eric Barnes, Physics

We are using computational methods to study the evolution of galaxies to further our understanding of dark matter. While dark matter has not yet been proven to exist, several lines of evidence strongly suggest its presence surrounding galaxies. Our simulations begin with a cluster of particles with a particular density profile that represents dark matter. Then we simulate the evolution of these galaxies over time using a program developed to compute the effects of gravity. The final spherical density profiles of the clusters are compared to past simulations created by similar programs and different theoretical models that have been developed. So far, our final density profiles have appeared slightly different from most theoretical models, and we will be exploring what factors cause these discrepancies.

### **U.41 Oral Health Education of Children in Coastal Ecuador**

Erin Fraundorf

Advisor: Darlene Lake, Modern Languages

Studies from the World Health Organization state that 92.4 percent of children age six in Ecuador are affected with dental caries compared to 46.8 percent in the United States, indicating that youth throughout the world display different oral health conditions based on their surroundings. This study provides insight into the overall oral care among children of Bunche, Ecuador, a representative of rural coastal towns in Ecuador, through interviews, images, and statistics. It was found that the oral health of the children is dependent not only on healthcare facilities and available resources, but also on education and the mentality of the culture in which they are raised. Due to the fact that children imitate both what they learn and observe, the limited education and knowledge of the importance of dental hygiene maintenance throughout the coastal Ecuadorian population leads to inadequate oral hygiene practices among its youth. Based on discussions with both children and adults, it was found that as a culture, neglecting to care for baby teeth is thought to be inconsequential when in fact, it not only contributes to a child's overall body health, but also to his/her development

of good habits. To increase awareness of the importance of proper dental hygiene practices, education was a large part of this research through the use of discussions, pamphlets, images, and hands-on demonstrations. Teaching the future generation of this developing country how to properly care for their teeth is critical, not just for oral health, but whole-body wellness. Additional education proved to be effective in increasing and improving dental care practices among the children within the time allotted. Results from research reveal the main causes for the poor dental hygiene in the youth of coastal Ecuador to be insufficient education and cultural perspective.

#### **U.42 Caves, Plazas, and Gods: The Impact of Geomorphology on Taíno Utilization of Ceremonial Sites**

Katharine Schwantes

Advisor: Connie Arzgian, Mississippi Valley Archaeology Center

In 1492, Columbus made his first contact in the New World with the inhabitants of the Caribbean, a people who belonged to a group now referred to as the Tainos. Classic Tainos were spread across Puerto Rico and Hispaniola and were characterized by large settled villages, a system of chiefdoms, and sophisticated agricultural practices. Their shamanistic religious beliefs included spirits and gods, referred to as *zemís*, which were tied into the landscape and rendered it an active rather than passive element in religious life. Geology had influence on not only the placement of ceremonial sites, but also the ways in which these sites were used. In this study, special attention was paid to four sites which contrast different aspects of geographical setting. Of these four sites two, La Manantiel de la Aleta and Cueva Lucero, are cave sites. La Manantiel de la Aleta is a submerged sinkhole in the Dominican Republic with a unique geomorphology and chemistry which has facilitated excellent preservation while Cueva Lucero, located in Puerto Rico, represents the uses of the more common dry cave sites. The final two sites, Caguana in Puerto Rico and Atajadizo in the Dominican Republic, are open air court sites. The purpose of the examination of these four sites is two fold. In order to understand the ways in which the geology of these sites may have affected their use it is necessary to look at them on a larger scale in relation to the surrounding landscape and other similar sites. Also considered were the individual sites in relation to their counterparts, taking into account aspects such as artifact occurrence and usage of space within the sites to ascertain the differences between the two sites and what role the geology of the site may have played in influencing utilization.

#### **U.43 UW-L Carbon Emissions: Comparisons and Recommendations**

Sarah Graf, Christina Kinney, Ian Johnson and Rachele Amundson

Advisors: Robin Tyser, Biology; Cythia Berlin, Geography and Earth Science and Kristofer Rolfhus, Chemistry

The University of Wisconsin-La Crosse's current energy usage and emissions profile was evaluated and compared to several UW System schools that had already compiled their emissions information. Expressing emissions on a per-student and per-1,000 square foot basis indicated that UW-L was comparable to other similar institutions. However, results suggested that UW-L's emissions were higher than state mandated targets. To reach these targets, several models replacing coal with varying combinations of wood chips and natural gas were simulated. Our models suggest that use of alternative energy sources may provide viable options for replacing the use of coal in UW-L's heating plant.

#### **U.44 Central Wrestling Attribution Research Project**

Steven Kurschner

Advisor: Alexander O'Brien, Psychology

The current study is designed to search for possible relationships between behavioral patterns exhibited during team activities, and season performance in high school wrestlers. This study will follow 12 student athletes who are enrolled at La Crosse Central High school and participate on the school's wrestling team. Each student athlete will be evaluated after every practice for 12 weeks based on overt behaviors of Accountability, Coachability, Resiliency, Locus of Control, Competitiveness, Self Discipline, Leadership, and Work Ethic; all are qualities exhibited by great athletes (Brown, 2005). Evaluations will be correlated with actual performance statistics at the end of the season, in an attempt to identify behavioral traits associated with successful season performances.

#### **U.45 Metal and Stone: The Synthesis of Intaglio and Lithography**

Ellen Danforth and Shawn Olichwier  
Advisor: Joel Elgin, Art

Through our research we explored the correlations between multi-plate color intaglio and lithography. In order to do this we attended an intensive three-day workshop in Barga, Italy. While in Italy, we also explored museums and galleries to enrich our cultural appreciation. Upon return, we have used the techniques learned in the workshop to improve and enhance our printmaking skills. The synthesis of these media has had a great effect on our work since then and can be seen through the application of color to lithography and the direct combination of the two media. Due to our time in Italy we have matured as both artists and as people and this is clearly reflected in our work.

#### **U.46 Alpha Motor Neuron Classification in Mammalian Neonates**

Melody Miller  
Advisor: Bradley Seebach, Biology

Central Pattern Generators (CPGs) are specialized neuron cell networks in the central nervous system that produce patterned and rhythmic bursts of electrical activity, assumed to be representative of the left, right and extensor, flexor motor behaviors used in swimming or walking. In vitro spinal cord preparations have recorded this bursting activity, which is commonly known as fictive locomotion. Currently, the contributions of individual alpha-motor neurons to these patterns are unknown. Furthermore, alpha-motor neuron properties in neonatal mammals have yet to be categorized based on muscle fiber types (i.e. slow, fast-fatigue-resistant, and fast-fatigable); these associations will help determine their input to fictive locomotion and overall motor behaviors. This project seeks to increase the consistency in obtaining intracellular recordings of stable action potentials from alpha motor neurons. Statistical analysis of these neurons will indicate whether or not such groups in the developing neonatal mammal correspond to adult, well-studied motor unit and motor fiber sub-categories. This research will also enhance understanding about the motor circuitry of the in vitro neonatal rat spinal cord model, which is often utilized for testing spinal cord injury interventions. Our overall laboratory goals seek to develop a more accurate description of mammalian lower motor units and their associated networks, both of which are important for motor behaviors such as walking and running.

#### **U.47 The Role of Skewness in the Accuracy of Confidence Intervals**

Maria Jansen  
Advisor: Barbara Bennie, Mathematics

The two-sample t confidence interval is currently the common method used to compare means. However, a big assumption must be made when using this interval; that the samples come from normal populations or the sample sizes are large enough so that the central limit theorem can be applied, and normality can be assumed. The accuracy of this method becomes questionable when the samples come from skewed populations, or when the samples are small. Under the current method, the actual coverage probability of a confidence interval comparing two means falls short of the claimed coverage when the assumptions are not met. Several variables besides skewness and the size of the samples contribute to the validity of the results generated by the two-sample t confidence interval, including the relative skewness and variances of the samples. Identifying the role that each of these variables play in the results of the two-sample t confidence interval would provide insight on how to improve the method's predictive power. My research has focused on the role of skewness. Using a simulation study, I have compared the actual coverage probabilities of many different skewness scenarios to a desired coverage level. The actual coverage probabilities have been computed using the two-sample t confidence interval, as well as several alternative methods that have been suggested as better models for skewed samples. This understanding of the role of skewness will be used to determine under what circumstances each of the current methods should be used. Ideally, it will also be used to create a new estimator that will generate results where the actual coverage probability is closer to matching the desired coverage probability.

#### **U.48 Measuring the Stability of DNA Hybrids Attached to Surfaces using Surface Plasmon Resonance (SPR) Spectroscopy and Atomic Force Microscopy (AFM)**

Chikki Chan

Advisor: Aric Opdahl, Chemistry

We are developing methods to study the thermal properties of short hybridized DNA structures that are attached to metal surfaces. Surfaces functionalized with single-stranded DNA probes are widely used in biosensor applications and have emerging uses in nanoscale building applications. While it is well known that the hybridization activity of DNA probes attached to surfaces is influenced by interactions between the DNA and the underlying surface, the influences that these interactions have on the stability of the resulting DNA hybridized structures are not understood. Surface Plasmon Resonance (SPR) was used to quantify stability by measuring the thermal denaturation (dissociation or melting) properties of DNA hybrids. SPR is routinely used to quantitatively measure association and dissociation events occurring at a surface, but it is unfortunately also inherently sensitive to temperature. A robust set of calibration methods was developed which allow for subtraction of temperature effects from the overall SPR data, resulting in quantitative melting profiles for DNA on surfaces. To measure how surface interactions affect stability, we prepared gold surfaces coated with DNA hybrids that have varied interactions with the surface. The two basic conformations we studied are hybrids that are end-tethered and directly-adsorbed. The end-tethered conformation was prepared using DNA functionalized with a 3' thiol group, which bonds strongly with gold. The resulting hybrids have minimal surface interactions. The directly-adsorbed conformation was prepared using DNA without a thiol functionality. These hybrids can only attach to gold by interactions involving the nucleotides, and thus have extensive interactions. The resulting SPR melting profiles demonstrate that the temperature required to denature DNA hybrids on surfaces strongly depends on both the nucleotide composition and the conformation of the hybrids. We are currently developing a complementary method to measure DNA denaturation transitions by Atomic Force Microscopy (AFM) measurements. To provide contrast in AFM images, nano-contact patterned surfaces were prepared containing regions of DNA hybrids and regions of thiolated polyethylene glycol, and then imaged while heating above the melting temperature. Changes in the relative height of these two regions that occur as the sample temperature are used to provide evidence of melting transitions.

#### **U.49 Examining the Link Between the Flagellum and the Mitochondrial Genome in Trypanosoma Brucei**

Adam Remick, Jacob Gietman and Sarah Kaufmann

Advisor: Nicholas Downey, Biology

The kDNA and flagellum of a *T. brucei* are shown to be strongly connected to each other; even after a cell is degraded, this connection remains intact. The hypothesis was tested through the use of RNA interference (RNAi) to determine if kDNA is localized to the flagellum. Tetracycline was used with phleomycin resistant cells to produce growth curves in order to determine the effects on the particular genes of interest. Immunofluorescence microscopy was used for the genes that showed possible interference. No overwhelming evidence of localization was found in any of the genes. We hope to find conclusive evidence over the next two months prior to the presentation.

#### **U.50 The Role of the Protein Tb 927.10.2950 on Kinetoplast Separation of Trypanosoma brucei**

Tiffany Terp and Leah Morgan

Advisor: Nicholas Downey, Biology

*Trypanosoma brucei* is a protozoan parasite that causes African Sleeping Sickness. This is a fatal disease that is transmitted by the tsetse fly and has devastated Africa. In order for future research to be conducted it is imperative to get a better understanding of the basic biology of the cell and its unique structures. *T. brucei* is an interesting parasite due to its unique and complicated biology. This specific protozoan has characteristics that differ from many well understood eukaryotes. Some of them include the kinetoplast DNA (kDNA), the tripartite attachment complex (TAC) and the basal body membrane. We are looking at a specific protein in *T. brucei*, Tb927.19.295 and determining where it is expressed in the cell and more importantly trying to understand its function. Some methods used to accomplish this have been PCR, SDS-PAGE gels, cloning, and recombinant DNA.

### **U.51 Exploring Compounds in Mushrooms for Antimicrobial Properties**

Jeremy Knoble

Advisor: Thomas Volk, Biology

Fungi have historically been a primary reservoir for the discovery of novel compounds which are used in the medical field. Not only have these compounds led to the development of many therapeutic drugs such as cyclosporine and lovastatin, but have also been a main source of antibiotics such as penicillin, cephalosporin, and their derivatives which have proven invaluable in the treatment of human infection. The majority of these fungally-derived antimicrobials have been obtained from fungi which produce no fruiting body (mushroom) such as molds. Our research was focused on exploiting the virtually untapped source of compounds found in the phylum Basidiomycota for their antimicrobial properties. Fungal fruiting bodies were collected, identified, and extracted using an organic solvent. Each extract was assigned a number to avoid experimental bias and protect future chemical patents. The crude extract was tested for antimicrobial activity using a disk diffusion assay (DDA) against two gram positive and two gram negative bacteria. Significant zones of inhibition were seen in extracts 263, 335, 402, 409, 424, 429, 434, and 437. Further testing will be conducted to isolate the active compound in each extract via thin layer chromatography (TLC) followed by gas chromatography-mass spectroscopy.

### **U.52 Elevated Phosphorus Concentrations In A Backwater Lake Of The Upper Mississippi River Increased Phytoplankton Biomass And Promoted A Cyanobacteria Dominated System**

Robert Mooney

Advisor: Eric Strauss, Biology

Phytoplankton are key organisms in the food webs of large lotic systems because of their ability to produce oxygen and serve as a vital basal food source. Often the main determinant of phytoplankton communities is the availability of nutrients, e.g. nitrogen (N) and phosphorus (P). Although these nutrients are necessary, increases in their concentrations are linked to eutrophication. The purpose of this study was to determine how P concentrations affected the phytoplankton community in a backwater lake of the Upper Mississippi River (UMR). In June 2010, carboys (3.7 L) were filled with water from mid-depth of Target Lake, and then a known amount of PO<sub>4</sub><sup>3-</sup> was added. To determine the effects on biomass and biodiversity, there were two treatments: a control (no P addition) and a +0.25 ppm PO<sub>4</sub>-P. Each treatment was repeated five times at various locations and incubated at mid-depth for 17 days. Chlorophyll a and Shannon-Wiener indices were measured to determine differences between the treatments. To determine P uptake rates, six treatments were used: a control, +0.05 ppm, +0.1, +0.2, +0.5, and +1.0 ppm PO<sub>4</sub>-P. Each treatment was repeated three times. The initial soluble reactive phosphorus concentration (SRP) of each treatment was measured, and it was measured again after 12 days of incubation. The amount of SRP taken out of the system was found by subtracting the post-incubation concentration from the initial concentration. Phosphorus uptake rates of the phytoplankton community were observed to follow Michaelis-Menton kinetics and the average uptake rate was 0.0176 mg P/L/day. In the presence of high P concentrations (>0.25 ppm PO<sub>4</sub>-P), the phytoplankton community significantly increased in algal biomass (chlorophyll a) and shifted from a green algae dominated to a cyanobacteria dominated community. There was a significant difference in the biodiversity indices of the natural and +P communities. These results suggest that increases in P delivery to the UMR might have profound effects on the biomass and diversity of the phytoplankton community.

### **U.53 Cardboard Citizens: Empowering the Homeless**

Eric Busse

Advisor: Beth Cherne, Theatre Arts

With the funds I received from my Undergraduate Research Grant, I will be traveling to London during the spring recess with the London Study Tour. While there, I will be able to observe an organization called Cardboard Citizens. This organization uses a unique art form called "Theatre of The Oppressed" in order to change the lives of homeless and displaced people. I will be able to closely observe the objectives of "Theatre of The Oppressed" art forms, and learn how it may be applied to my current studies at the University of Wisconsin La Crosse. I will have the privilege of participating in several workshops hosted by Cardboard Citizens, and it is my intention to share what I was able to learn in regards to how Cardboard Citizens has been using theatre to empower homeless individuals living in London.

#### **U.54 Effects of Restraint Stress on CRF2 Receptor Expression in Enteric Neurons in the Colon**

Christopher Herbst  
Advisor: Sumei Liu, Biology

Background: Stress disturbs gastrointestinal function. Corticotropin releasing factor (CRF) has been implicated in stress-evoked gastrointestinal functional changes through both central and peripheral mechanisms. Stress increases colon motility by activating the CRF1 receptor, while activating the CRF2 receptor reduces this stress response. The aim of the present study was to investigate the effect of stress on the expression of CRF2 receptors in the enteric nervous system of the rat colon. Methods: Male adult Sprague Dawley rats were placed under restraint stress for 1 h. Controls were allowed to move freely in their cages without restrained. Fecal pellet output (FPO) was monitored for 1 hr. Animals were euthanized at different time periods ranging from immediately after stress to 24 hours after the 1 h stress period. Segments of the colon were removed. Whole-mount myenteric and submucosal plexus preparations were used for immunohistochemical staining for the expression of CRF2. Results: The mean numbers of CRF2 immunoreactive neurons per ganglion for the control group were  $10.17 \pm 1.14$  for the myenteric plexus and  $4.92 \pm 0.85$  for the submucosal plexus. The mean numbers of CRF2 immunoreactive neurons per ganglion for the stress group were  $16.93 \pm 6.03$  for the myenteric plexus and  $6.68 \pm 1.31$  for the submucosal plexus. A t-test returned p-values of 0.45 for the myenteric plexus and 0.4 and submucosal plexus. Conclusions: Although the mean numbers of CRF2 immunoreactive neurons per ganglion in the stress group is higher than the control, more data is needed to determine if the difference is statistically significant.

#### **U.55 The Relations Between Academic Achievement and Depression Among Middle School Students**

Jessie McAllister  
Advisor: Emily Johnson, Psychology

The combination of anxiety and depressive disorders is one of the most consistently reported patterns of comorbidity among children and adolescents in the United States. Early learning problems have predicted later distress in life, including depressive symptoms in boys. One study found that pressure to succeed in school, as evidenced by time spent in a cram program among Taiwanese adolescents, was related to negative psychological well-being; one aspect of negative psychological well-being is depression. Since there is so little research conducted about depression in middle school, especially within the Hmong American population, this study is meant to provide more information about this topic. The purpose of this study is also to determine the effects of commitment and attitudes towards school on depression among middle school Caucasian American and Hmong American students. Participants will be selected from two La Crosse schools, one class from each grade in sixth, seventh, and eighth. Selected participants will complete three questionnaires: the Attitudes Toward School-Denver Youth Survey, the Commitment to School-Seattle Social Development Project Survey, and the Center for Epidemiological Studies Depression Scale for Children. Depression scores will then be correlated with each of the school questionnaires. It was hypothesized that students having both lower commitment and lower attitudes toward school would rate higher on the Center for Epidemiological Studies Depression Scale for Children which would indicate increasing levels of depression.

#### **U.56 Fabrication of Low-Resistance Al Doped ZnO Films for Photovoltaic Applications**

Ian Smith and Lorelee Bilke  
Advisor: Seth King, Physics

Although solar cells (more generally referred to as photovoltaic (PV) devices) promise a route to clean, abundant energy, significant challenges in materials physics and chemistry must be overcome before these devices may be deployed on a large scale. To lower the inherent materials costs of traditional solar cells, thin-film cells must be employed. In turn, such cells require both an efficient photovoltaic absorbing medium as well as a transparent medium with good electrical conductivity to extract the desired photocurrent. Currently, thin-film solar cell devices use tin doped indium-oxide (ITO) as this transparent conducting oxide (TCO) layer. However, indium is as scarce in the earth's crust as silver, and costs about the same. Obviously, a more economical, and abundant material must be found. / / Zinc oxide (ZnO) is an extremely inexpensive material which shows great promise for replacing ITO as the TCO layer necessary for modern PV devices. However, ZnO does not exhibit a sufficiently low resistance for solar cell applications. Therefore, our work focuses on the fabrication of aluminum doped ZnO, a material which exhibits properties desirable for replacing ITO in PV devices.

### **U.57 Mapping The Spread of Fennel on Santa Cruz Island**

Tricia Flaherty  
Advisor: Ryan Perroy, Geography and Earth Science

The threat of invasive species to global economies and biodiversity is well documented, but actual invasion rates and mechanisms are less well-understood, even though these data are critical in effectively eliminating, controlling, and preventing invasions. This study examined the spread of *Foeniculum vulgare* (fennel) within Saucos canyon on Santa Cruz Island, CA, following the removal of grazing animals in the late twentieth century. A high resolution aerial imagery time series (1986-2009), and repeated field surveys of individual fennel plants on the ground (2007-2010), were used to determine the position and rate of spread of fennel over multiple scales. Within the Saucos watershed, fennel invasion generally proceeded from central disturbed floodplain areas, including along roads and tributaries. From 1986 to 2010, the area covered by fennel increased dramatically, reaching 100% in some locations. The number of fennel plants recorded within the vegetation field survey study site increased from 280 in 2007 to >1000 in 2010.

### **U.58 Development of New Green Catalytic Systems for Alkane Oxidation**

Betsy Brown  
Advisor: Robert McGaff, Chemistry

Phthalocyanines are flat, conjugated, porphyrin-like molecules that are generally used for dyes, electronics, catalysis and gas sensing. Several years ago, our group synthesized a new type of metallophthalocyanine via a one pot solvothermal synthesis utilizing various primary alcohols and metal acetate salts ( $M(OAc)_2$ ). The resulting modified phthalocyanines are termed diiminoisolindinato phthalocyaninato, or DiiPc. The metal best suited for oxidation catalysis is iron, which is found in many natural systems and is not toxic to the environment. DiiPc[Fe] was used as an oxidation catalyst for cyclohexane and cyclooctane with turnover numbers (moles of product per moles catalyst) of 100.8 and 122.2, respectively. These turnover numbers are exceedingly better than similar-structure catalysts in current literature.

### **U.59 Erythrocyte Membrane Fatty Acid Composition As An Indicator of Dietary and Metabolic Status**

Shannon Holliday  
Advisor: Margaret Maher, Biology

Diagnosis and monitoring of metabolic and eating disorders in humans may include the use of screening tools; medical, social, and diet histories and anthropometrics measurements and blood tests. However, there are few tests that determine the effects of malnourishment on the composition of cell membranes. Linoleic (18:2, omega 6) and alpha-linolenic (18:3, omega 3) acids, are polyunsaturated fatty acids that must be obtained from dietary sources due to the body's inability to synthesize them. They are elongated and desaturated in the body and incorporated into phospholipids for placement in cell membranes. Thus, dietary fat consumption can influence very basic functions of cells and cell signaling. The purpose of this study is to investigate the potential of an additional assessment tool, red blood cell (erythrocyte) fatty acid analysis, for diagnosis and monitoring of metabolic and eating disorders. With gas chromatography, we will analyze erythrocytes from thirteen-lined ground squirrels under different feeding conditions. Ground squirrels undergo hyperphagia leading up to hibernation and hypophagia during hibernation, which makes them a good model for studying these extremes in dietary intake. Blood drawn before, during, and after hibernation will be analyzed using fatty acid methyl ester (FAME) procedures with gas chromatography. Our results in squirrels may be applied to develop protocols to monitor nutritional status of humans with metabolic or eating disorders in future studies.

### **U.60 Assessing the Binding of Triclosan, an Emerging Antimicrobial Contaminant, to Natural Sources of Dissolved Organic Matter**

Danielle Irvin and Sasha Chihak  
Advisor: Nadia Carmosini, Chemistry

Triclosan (TCS) is an antimicrobial pesticide used in a range of consumer products, including soaps, deodorants, footwear, and clothing. Typical usage of these products results in the movement of TCS into wastewater treatment plants where the compound is only partially removed from the waste stream; thus, wastewater effluents and biosolids are a primary environmental exposure route for TCS. Subsequent environmental fate and transport processes for TCS will be dictated by the compound's mobility and persistence in water, soils, and biosolids. In these environmental matrices that are rich in dissolved organic matter (DOM), binding or sorption to DOM has the potential to enhance



contaminant mobility, alter decomposition rates, and reduce bioavailability. Therefore, information on TCS-DOM interactions is critical to understanding the compound's environmental fate and potential impacts. We are quantifying the binding of TCS to natural DOM sources with variable chemical properties (i.e., cation exchange capacity, hydrophobicity), and to DOM extracted from municipal biosolids. To assess the importance of diverse binding mechanisms, TCS-DOM sorption coefficients (K<sub>DOM</sub>) are being evaluated at two pH conditions (6 and 9), where TCS (pK<sub>a</sub> = 7.9) exists primarily as a neutral compound and as an anion, respectively. Preliminary results indicate that TCS possesses a moderate affinity for Leonardite humic acid, with log K<sub>DOM</sub> values ranging from 3.65 to 4.16.

#### **U.61 The Isolation of a Potentially Novel Organism from the Intestinal Flora of the Aquatic Slug *Arion Fasciatus***

Jesse Reiter  
Advisor: Bonnie Bratina, Microbiology

Microscopic Observations have shown a diverse microflora, some with unique morphologies, within the slug gut of *Arion fasciatus*, a newly discovered aquatic slug. Given the slug's unique habitat there is a possibility of finding novel organisms within the slugs gut flora. These novel organisms could potentially provide antimicrobials for use in the medical industry or enzymes for use in the biodegradation industry. Previous research has identified 16S ribosomal RNA (rRNA) gene from a potentially novel lineage of bacteria, distantly related to *Mycoplasma* and *Spiroplasma*. The objective of my research was to isolate this novel potentially *Mycoplasma/Spiroplasma*-like bacterium. Ten types of enrichment selective media used to isolate and grow *Mycoplasma* or *Spiroplasma* were inoculated with several dilutions of homogenized slug gut. Although many organisms grew on the media used, thus far isolation attempts have failed to isolate the novel organism. Sequencing the 16S rRNA gene from the organisms that did grow showed that several of these isolates were *Buttiauxella*, a bacterium commonly found with in our clone libraries and a known inhabitant of slug and snail intestinal tracts. Primers to the novel 16S rRNA gene are being designed to aid in future isolation attempts including a plate-wash technique to rapidly screen growth from a variety of media incubated under various conditions.

#### **U.62 Simulation of Dark Matter Distributions**

Samuel Marks  
Advisor: Eric Barnes, Physics

Galaxies are composed of billions of stars held together by gravity. However, observations indicate that the stars alone cannot account for all of the mass of a galaxy. Dark matter is the currently favored route to explaining the formation and evolution of galaxies. We are building computational models to describe various density profiles found in nature, and more importantly, the uncertainties associated with those density calculations. Upon completion in the near future, our program will be a useful tool for analyzing data from simulations and real galaxies. Specifically, we will quantify the precision of computational models, allowing us to constrain observable physical characteristics of galaxies.

#### **U.63 Predictors of Parental Involvement in Education**

Nichole Rich  
Advisor: Enilda Delgado, Sociology and Archaeology

Pre Parental involvement in school has been linked to positive student achievement (Desimone, 1999, Turney, & Kao, 2009) and better school outcomes for elementary, middle, and high school students (Shah, 2009; Green, Walker, Hoover-Dempsey, Sandler, 2007). Because parental involvement in education has a positive outcome for students it is important to look at its predictors. A quantitative analysis of the fifth grade cycle of the Early Childhood Longitudinal Study Kindergarten (ECLS-K) was used to examine predictors of involvement which included child's race, socioeconomic status, parents current marital status, school type, mother and fathers current age, number of siblings and degree expected of child. The results indicate that SES, parents current marital status, and school type were the most significant in all models in determining parental involvement in education

## **U.111 UW-L Carbon Emissions: Fiscal Years 2009 & 2010**

Christina Kinney, Sarah Graf, Ian Johnson, and Rachelle Amundson  
Advisor: Kristopher Rolfhus, Robin Tyser, and Cynthia Berlin

The University of Wisconsin-La Crosse's current amount of carbon emissions was established to serve as an emission baseline for analyses of future changes in energy use. Data used to estimate UW-L's emissions were obtained from the power plant, campus vehicles, off-campus sources of electricity, and other sources which quantified transportation emissions. The "Clean Air Cool Climate Calculator", a spreadsheet model commonly used by other universities to estimate total emissions in metric tons of carbon dioxide, was used to summarize our emissions profile. For fiscal years 2009 and 2010, total emissions were calculated to be 45,886 and 41,334 metric tons, respectively. Total emissions for 2010 were 10% lower than 2009 emissions. The lower emissions in 2010 can be attributed to burning more natural gas, which produces considerably less carbon dioxide than coal.

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

**U.64 How Could They Let This Happen? Blame Judgments Following School Shootings**

Molly Koby  
Advisor: Betsy Morgan, Psychology

This study investigates the factors that affect blame judgments after school shootings. Investigations of attributions associated with school shootings are particularly noteworthy because they reflect acts of violence where the larger community is often held responsible along with the shooter. After the school shooting at Columbine, polls showed that 85% of Americans held the parents responsible for the shooters' actions (Belkin, 2009). Participants were asked to read a judge's summary detailing a civil case in which the parents of a victim of a school shooting were suing the school district and the parents of the shooter in a wrongful death lawsuit; in the testimonies, the shooter and victim were either portrayed negatively, positively, or neutrally. Following reading the summary, participants were asked to assess the level of blame towards the school district and parents of the victim. Early results suggest that the victim's portrayal drives the extension of blame judgments on those not directly involved with the shooting.

**U.65 Regadenoson Versus Adenosine: A Patient's Perspective**

Katie Frank  
Advisor: Carlyn Johnson, Nuclear Medicine Program Director at Ministry St. Joseph's Hospital

Objectives : Regadenoson (Lexiscan) is an A<sub>2A</sub> adenosine receptor agonist indicated for use as a pharmacologic stress agent in myocardial perfusion imaging. Regadenoson was first approved in April of 2008; however, Ministry St. Joseph's Hospital did not begin performing regadenoson stress tests until April of 2010. The following study was conducted to compare a patient's perspective of regadenoson versus adenosine as well as the symptoms of each test. /Methods : Data was collected from questionnaires on over sixty-five patients who had previously undergone an adenosine sestamibi and were undergoing a regadenoson sestamibi. Patients were asked if they remembered the previous adenosine stress test and about any symptoms they experienced. They were then asked about any effects of the regadenoson and to compare the regadenoson to the adenosine overall. Results : Out of the 50 patients who remembered their previous adenosine stress test, 74% of them favored the regadenoson. Symptoms were experienced with both types of pharmaceuticals. The most common side effect with regadenoson patients was headaches whereas chest pain was more common in patients given adenosine. Conclusions : Patients favored regadenoson over adenosine and had fewer symptoms comparatively.

**U.66 Correlation of Aerosol Lung Scans and Patient Compliance**

Allison April Filtz  
Advisor: Carlyn Johnson, Nuclear Medicine Program Director at Ministry St. Joseph's Hospital

Lung ventilation aerosol scans have long been debated, regarding the amount of room and personnel contamination that occurs during administration. Since lung ventilation requires an inhalation administration, the patient dose is highly dependent on patient cooperation. To determine the rate of contamination occurrence, research with 99mTc-DTPA aerosols for lung ventilation scans was performed and correlated to patient compliance. Methods : Research was done on ten patients by performing wipe tests of four areas, before and after administration of the 99mTc-DTPA aerosol kit. These areas included: technologist coat, technologist mask, cart that holds the 99mTc-DTPA aerosol kit, and the floor area around the patient. Each patient examined was rated on a compliance scale of one to four; one being highly compliant and four being non-compliant. All data was recorded in an Excel spreadsheet and differences were determined between the pre-ventilation and post-ventilation data to determine if any or how much contamination occurred. Results : When comparing the data, it was determined that contamination did occur with 99mTc-DTPA aerosols for lung ventilation scans. The amount of contamination that occurred had an apparent correlation with patient compliance. When patient compliance was rated as a one or two, minimal/negligible contamination occurred. When patient compliance was rated as a four, high contamination occurred. Conclusions : Lung ventilation scans using 99mTc-DTPA aerosols were determined to have minimal contamination when patients were compliant compared to the moderate contamination found with noncompliant patients.

## **U.67 Decision Making Relative to Pacing Strategy in Running: Test of the Hazard Score Hypothesis**

Katherine Malterer

Advisor: Carl Foster, Exercise and Sport Science

Physical pacing is an essential task that every living thing needs to learn. Humans use it in everything from excelling in athletic competitions to getting up and walking around after having open heart surgery. Our ability to pace our effort ensures that we can accomplish the tasks that we set out to do without exhausting ourselves. Accordingly, performance in any physically demanding task depends on a motor template and feedback regarding how the task is affecting the body. The 'language' of this feedback is the rating of perceived exertion (RPE). Previous evidence from our laboratory suggests that RPE x the % of distance remaining, the Hazard Score (HS), determines whether the athlete speeds up or slows down. The purpose of this study was to test if the HS will predict changes in running velocity during 3km time trials. Experienced, recreational level runners completed 3km running time trials. Changes in momentary running velocity vs. HS were computed every 200m by comparing the running velocity immediately (100m) before providing a RPE score with the running velocity immediately (100m) after, to test the hypothesis that HS>3 yields deceleration & <1.5 yields acceleration. Regression analysis ( $R^2=0.1946$ ) of thirty four 3km time trials in 12 subjects, yielding 473 observations, revealed a regression curve predicting acceleration with HS <1.5 and deceleration with HS >3.5, which substantially supports the experimental hypothesis. We conclude that the HS may be a tool for understanding how humans regulate energy expenditure during exercise.

## **U.68 Effects of Herbal Tea or Extract on Uric Acid Parameters in Humans and Rats**

Xiong Yang

Advisor: Margaret Maher, Biology

Uric acid kidney stones were common in Hmong-Americans diagnosed with kidney stones in La Crosse, WI. A plant-based tea that the Hmong use for kidney problems may affect uric acid metabolism and transport in the kidneys to alter stone formation conditions. We aim to determine effects of consumption of this tea in humans and to develop an animal model to study the effects of tea extracts on uric acid metabolism and transport. In a random order, crossover design, with tea and water (control) consumption, 24-hour urinary uric acid (UUA) was measured in men ( $n=10$ ,  $20\pm 1$  years) supplied a high-purine diet (2154 kcal, 146 gram high biological value protein). UUA in humans was  $547\pm 99$  mg/day with water and  $630\pm 92$  mg/day with tea consumption. Specific gravity, pH, and urine volume were also assessed. Anesthetized rats were infused with tea extract or vehicle with time 0, 30, 60, and 90 serum (SUA) and urine measurements of uric acid. We found rat SUA and UUA to be quite variable, despite control of diet, sleep-wake cycle and surgical preparation for study. But UUA to SUA ratio may provide useful information for future extract testing. Our results, thus far, indicate that longer consumption studies and further development of an appropriate animal model to study active fractions of tea extracts are needed.

## **U.69 To Establish CD43 as a Prognostic and Diagnostic Tool**

Greta Foley

Advisor: Carl Simon Shelley, Microbiology and Director of Hematology/Oncology Research at Gundersen Lutheran

Despite major advances in the field of medical oncology, lung cancer remains the leading cause of cancer deaths in the United States among both men and women. With an estimated over 215,000 new cases and 161,840 deaths in 2008, lung cancer is responsible for more than 25% of all cancer deaths. The disease accounts for more deaths than breast, prostate, colorectal, liver and ovarian cancer combined. A shocking statistic is that for lung cancer patients with stage IV disease the five-year survival rate is less than 1%. Due to these shocking statistics, I began a research project in the Oncology Research laboratory at Gundersen Lutheran focusing on lung cancer. CD43 is a molecule that prevents cells from binding to one another. Under normal circumstances, CD43 exists only on the surface of white blood cells and never on the surface of lung tissue. However, unlike normal lung tissue, malignant lung tissue has the ability to produce CD43. My hypothesis is that CD43 represents a new tool for identifying lung cancer and predicting its outcome. I am currently testing this hypothesis by examining CD43 production in tumors isolated from 300 lung cancer patients with different types and severity of the disease. These tissue samples are located in the Gundersen Lutheran BioBank and have been processed by the pathology department of the Gundersen Lutheran Medical Center. Formalin-fixed, paraffin-embedded tumor tissue isolated from these patients will be assessed for CD43 expression by immunohistochemistry. The degree of CD43 expression will be correlated with histologic sub-type to determine diagnostic utility and with

tumor gender and stage to determine prognostic utility. At the conclusion of these studies I expect to have established CD43 as a new tool that can be used to detect and predict lung cancer.

#### **U.70 Examining Soil Properties Along An Island Chronosequence in the Upper Mississippi River**

Sarah Leschisin and Marty Falk

Advisor: Ryan Perroy, Geography and Earth Science

The United States Fish and Wildlife Services, in collaboration with the Army Corps of Engineers and state and local agencies, are in the process of creating man made islands in the Upper Mississippi. These newly developed islands, and older ones that have survived previous erosion events, can be considered as a chronosequence: a collection of related landforms that only differ in properties due to time (Huggett,1998). When analyzing the chronosequence of islands there is an assumption that the other variables such as climate are consistent to each island where only time varies. The goal of the research was to identify and sample a chronosequence of islands where quantitative data can be collected to determine if there is relationship between island age and various soil properties, such as soil horizon development and the amount of organic matter present in the soil. We collected soil pit data from thirteen different islands ranging in age from 120 to 8 years old, digging 1-3 soil pits per island and collecting 48 total soil samples for this study. All soil samples were categorized by color, texture and diagnostic soil horizon. Soil organic matter content was also determined via loss on ignition testing. Preliminary results indicate that older soils show a higher degree of pedogenic development, those these results need to be interpreted within the context of a landscape undergoing very dynamic fluvial processes, such as repeated seasonal flooding. Although our research focuses mainly on the temporal aspect of island development, further research may be able to decipher the soil properties in conjunction with these larger fluvial processes.

#### **U.71 A Comparison of the Recreation Programs for Children with Disabilities in Appleton, WI and Bunche, Ecuador**

Andrew Verhoeven

Advisor: Patricia Ardovino, Recreation Therapy and Therapeutic Recreation

The intent of this research was to compare the recreation services for children with disabilities in Appleton, Wisconsin and Bunche, Ecuador. Data was gathered for Appleton, Wisconsin through observations of children and interviewing faculty at Huntley Elementary School. Similarly, the information for Bunche, Ecuador was gathered through observations of children and interviews with faculty at Escuela Fiscal Mixta No. 77, staff at Hospital Dr. Carlos Del Pozo Melgar, and residents of Bunche. The results of this study indicated that there are many differences in the types of services offered to students with disabilities. These differences include funding, the role of recreation in schools, determination of what constitutes risk, and the importance of establishing goals. The similarities included the needs of the communities and the desire for recreation participation. This project was made possible by a research grant funded by the University of Wisconsin La Crosse Undergraduate Research Program.

#### **U.72 The Mediating Effects of Acculturation on the General Well-Being of Asian international Students**

Laura Imming and Brendan Bobylak

Advisor: Dung Ngo, Psychology

In this study, we assessed the mediating effects of acculturation on the general well-being of Asian international students. A total of 37 participants (27 from an online survey and 10 from a pencil and paper survey) took our survey, which included measures of demographics, levels of acculturation, general well-being, and English proficiency. Contrary to what was hypothesized, level of acculturation was not correlated with general well-being. In addition, due to the low sample size, there was inconclusive evidence for positive correlations between gender, grade level, length of residence, and place of residence and general well-being scores. Further study into this area of research is required.

#### **U.73 Black Negrophobia in Brazil**

Adia Brooks

Advisor: Cecilia Manrique, Political Science and Public Administration

Negrophobia, or the profound fear or hatred of black people and their culture, is not only a worldwide issue, but also a significant issue among black people. As part of a multipronged attempt to reveal negrophobia's prevalence to the world community, I seek to develop a way to measure negrophobia among blacks. By pursuing this project, I want to

help develop the vocabulary with which negrophobia can be discussed, and help promote its international analysis. Negrophobia is a new field of study, and its relevance cannot be exaggerated. My particular project focuses on the perspectives of Afro-descendant residents of São Paulo, Brazil, on a host of topics. I will administer a paper survey to forty or more individuals to discern the degree to which they favor lighter skinned people over dark skinned ones, their racial group identification, their perception of Brazilian race relations, their responses to stereotypes about blacks, and their attitudes about anti-discrimination policies. Using factor analysis, I will quantify a Negrophobia Score which will illustrate the level of self-hatred exhibited by each respondent. I am expecting Paulistano Afro-descendants to have high negrophobia scores due to the nature of Brazilian society. Negrophobia levels may be higher in the older generations (45 and older), but I do not expect a great variation between the latter and the more youthful generations (18 to 44). I also anticipate that negrophobia levels will increase with a respondent's income. This project is among the first attempts to establish negrophobia as a field of study and to promote its international analysis.

**U.74 Investigating the Role of Acute Application of NT-3 in Up-Regulation Of P75-TrkC Hetero Complexes in Neonatal Rat Spinal Neurons Using Immunofluorescence in Conjunction with Confocal Microscopy**

Kyle Wojcik

Advisors: Bradely Seebach and David Howard, Biology

For quite some time researchers have been interested in the study of the nervous system because of its implications in spinal cord injury and repair. An especially interesting aspect is the diversity of projects currently underway in this field. This project focuses on two specific neuronal receptors (p75 and tyrosine receptor kinase C or TrkC) and their properties. NT-3 is a tropic factor and falls in the class of neurotrophins. These molecules promote cell survival, proliferation, and differentiation as well as the guidance of axonal and dendritic growth. This aspect is of considerable interest in the treatment of patients with spinal cord injuries. It has been shown that activation of the p75 receptor yields cell death (apoptosis) while the TrkC receptor activation yields cell growth. The formation of heterodimers between these two receptors produces effects that are not yet conclusively determined, but seem to lower the apoptotic activity of p75. Thus they are of particular interest current studies. The proposed question this study seeks to evaluate is if application of NT-3 will cause a change in the p75 and TrkC receptor populations. It is expected that the NT-3 will cause increased release of these receptors or for some of these receptors to dimerize (interact) with each other, or both. The data collected will lead to a better understanding of neuronal mechanisms serving as a resource for future studies. The methods of investigation include dissecting out a neonatal rat spinal cord, then freezing it and taking sections and (after submersion in an artificial cerebrospinal fluid containing the NT-3 neurotrophin) examination for changes in receptor populations. Specific antibodies will be used to identify and illuminate the protein receptors of interest. Results will be determined using fluorescence and confocal microscopy.

**U.75 Structure-function Differentiation of Beta-edge Variants of Hemolysin A Using Size Exclusion Chromatography**

James McDermott

Advisor: Todd Weaver, Chemistry

Hemolysin A (HpmA) from *Proteus mirabilis* is secreted via a Two-Partner Secretion (TPS) pathway, which is utilized by Gram-negative bacteria as an energy-independent mechanism for secretion of virulence factors. Truncated HpmA (HpmA265) has been shown to activate full-length HpmA in a template-assisted fashion. Crystallographic analysis of HpmA265 revealed a right-handed  $\beta$ -helical structure and a dry dimeric interface between exposed carboxy-terminal  $\beta$ -edges. A series of carboxy-terminal mutants of HpmA265 were engineered using negative-design theory, where a positively charged lysine residue was substituted at the non-polar dry, dimer interface. The replacements included phenylalanine 241 (F241K), methionine 245 (M245K), and leucine 263 (L263K). Recent circular dichroism and hemolysis studies reported decomposition of the classic beta signal and loss in hemolytic activity for M245K and L263K. To further investigate the relationship between HpmA265 structure and function, quantitative hemolytic activity was mapped to the resultant size-exclusion chromatogram. Template-assisted hemolysis of HpmA265 after size-exclusion chromatography (SEC) showed hemolytic activity corresponding to a molecular weight of 27 kDa. This is close to the monomeric weight of 25 kDa for HpmA265, which suggest a monomeric form of HpmA265 initiates the folding of full-length HpmA during hemolysis. Template-assisted hemolytic activity of HpmA265 variants, F241K, L263K, and M245K, had activity concentrated around a molecular weight of 21 kDa, which again is indicative of monomeric activation of hemolysis.

## **U.76 Perceptions of Rape Perpetrators Based on Skin Tone, Attire, and Relationship to Victim**

Stephanie Sandor and Michelle Eddy

Advisors: Katherine Kortenkamp and Carmen Wilson, Psychology

The CDC states that 20-25% of college women will experience a completed or attempted rape at some point during their life (Fisher et al., 2000). A stereotype about rape perpetrators is that a majority are African American men who rape White women (Baker, 1997; Reddington & Kreisel, 2005). Additionally, urban clothing is often associated with African American stereotypes. Finally, although 67% of victims have some form of relationship with their rapist, it's a common stereotype that most rapists are strangers to their victims (Bureau of Justice Statistics, 1997). This study examined blame attributions towards African American rape perpetrators. Skin tone, attire, and relationship to victim were varied in a 2 x 2 x 2 between subjects design. We hypothesized that participants would attribute more blame and guilt to a dark-skinned as opposed to a light-skinned African American perpetrator because African American with lighter skin tones have been shown to be viewed more favorably (Hill, 2002). We also hypothesized that perpetrators who are strangers to the victim or wearing urban clothing will be blamed more than those who are acquaintances of the victim or wearing preppy clothing. College women (N = 180) assessed levels of blame and guilt after reading a mock newspaper article that described an alleged stranger or acquaintance rape. The article was accompanied by one of four different images of the alleged rape perpetrator. The skin tone was either African American light or dark and the attire was preppy or urban. Results using ANOVA tests showed significant effects of relationship. Participants were more likely to consider the event a rape (p = .045) and less likely to think that the victim enjoyed the alleged rape (p = .027) if the perpetrator was a stranger rather than an acquaintance. Other findings indicated significant interactions between relationship and attire. / / References / Baker, K.K. (1997). Once a rapist? Motivational evidence and relevancy in rape law. *Harvard Law Review*, 110(3), 563-624. / Bureau of Justice Statistics. Sex offenses and offenders: An Analysis of Date Rape and Sexual Assault. Washington, D.C.: U.S. Department of Justice, 1997. / Fisher, B.S., Cullen, F.T., & Turner, M.G. The sexual victimization of college women. Washington (DC): Department of Justice (US), National Institute of Justice; 2000. Publication No.: NCJ 18236 / Hill, M. (2002). Race of the interviewer and perception of skin color: Evidence from the Multi-City Study of Urban Inequality. *American Sociological Review*, 67(1), 99-108. doi:10.2307/3088935.

## **U.77 Discovering Antibiotics Among Native Plants of Wisconsin**

Andrew Maike

Advisor: Aaron Monte, Chemistry

The current rise in MRSA (Methicillin-resistant *Staphylococcus aureus*) and MDR-TB (Multi Drug resistance Tuberculosis bacillus) has created an urgent need for new antibiotic compounds to target the evolving bacteria. Thus, a pandemic could be avoided with the discovery and isolation of new antimicrobials. The *Galium tinctorium*, or small cleaver plant, is a perennial plant commonly found in swamps, marshes, and low-lying areas. Being native to Wisconsin, this plant can be found in the Northern woods and even on the bluffs of La Crosse. Native Americans often used the plant in the form of a tea for treatments to combat ailments such as asthma, coughs, and bronchitis. To isolate and identify possible antimicrobial compounds from this plant, large quantities of it were collected and dried. The plant material was extracted using ethanol and methylene chloride and the antimicrobial activity of the crude extract was assessed using disc diffusion assay (DDA) techniques on strains of both gram positive and gram negative bacteria. Thin layer chromatography (TLC) was used to separate the active antimicrobial compounds from the other compounds. Two molecules with antimicrobial activity were identified. Once purified, the chemical structures of these active compounds can be deduced using a range of spectroscopic techniques.

## **U.78 Using Photovoice Research to Evaluate the Impact of a Gardening Experience on the Social Development of Preschoolers**

Alyssa Buchman

Advisor: Christine Hippert, Sociology and Anthropology

Community-based gardens provide a place for community members to receive fresh, locally grown, organic produce and give people a place to get exercise and build their community. This project looks beyond these benefits to learn more about how community gardens impact Preschoolers' social development, including creating a social network, developing leadership, and improving teamwork skills. Little research has been done on community gardens and less conducted with pre-schoolers. This project fills that gap and provides a step toward analyzing the impacts of community gardens on young children's social development. Ethnographic research methods used in this project

include participant observation, photovoice, and interviews with parents at the childcare center. Photovoice research is a form of participatory data collection where the participants are given cameras and use them to capture images of what they are experiencing in their community. It provided insight into what the children were experiencing when they might have difficulty expressing it in words. The results of this project show how children and families experience the 'community' aspect of a garden and how working there has a positive impact on social development. The children were able to interact with others their own age and older who helped show them how to work the camera. They also learned about teamwork by working together to fill watering cans and helping each other with gardening tasks, such as finding bright red tomatoes during harvest time. The parents used their time at the garden as a social networking experience through sharing gardening tips and recipes that use various foods from the garden. Overall, this project demonstrates that community gardens provide a significant venue for social development between children of different ages, where they learn new skills from other children. The garden also provides an entry point for adults to make connections with other adults who have similar values.

#### **U.79 Preliminary Characterization of a Carnocin Produced by a Carnobacterium Isolated from an Antarctic Lake**

Rachel Campbell

Advisor: Bonnie Bratina, Microbiology

Carnocins are small proteins produced by Carnobacteria that are thought to inhibit the growth of closely related organisms. Carnocins are a subset of the bacteriocins, compounds that may have industrial applications as natural food preservatives. A number of Carnobacteria isolated from lakes within the Antarctic Dry Valleys were screened for the production of carnocins in a previous study. Over 20 strains were found with various levels of observable carnocin activity. Carnobacterium LV65.5:5.1 was selected for further characterization based on the results of an agar plate overlay activity assay using *Micrococcus luteus* as the target organism and some preliminary results from the previous study. Carnobacterium LV65.5:5.1 produced a carnocin that was able to inhibit *Micrococcus luteus*, *Bacillus subtilis*, *Bacillus cereus*, *Listeria monocytogenes*, *Lactobacillus plantarum*, *Leuconostoc mesenteroides* and *Escherichia coli* ATCC 25922. The inhibition of *E. coli* was unusual for a bacteriocin produced by a gram-positive organism, and was one of the reasons for further investigating this strain's carnocin. Carnocin production was quantified using a titer plate assay with *Listeria monocytogenes* as the target organism. Further research is underway to optimize carnocin activity by varying growth parameters and to characterize the carnocin based on its temperature sensitivity and shelf life and its susceptibility to enzymes such as pepsin and papain. Results of this study should determine the viability of this carnocin for industrial applications.

#### **U.80 Effects of Restraint Stress on CRF Expression in Enteric Neurons in the Rat Stomach and Colon**

Kaylee Beckwith and Nicole Long

Advisor: Sumei Liu, Biology

Sprague Dawley rats were placed under restraint stress for 1 h. Controls were allowed to move freely in their cages without restrained. Fecal pellet output (FPO) was monitored for 1 hr. Animals were euthanized at different time periods ranging from immediately after stress to 24 hours after the 1 h stress period. Segments of the stomach and colon were removed. Whole-mount myenteric and submucosal plexus preparations were used for immunohistochemical staining for the peptide CRF. Results: Exposure to restraint stress for 1 h significantly increased the fecal pellet output (control: 2.2  $\pm$  0.4 vs. restraint stress: 7.0  $\pm$  0.8;  $P < 0.001$ ), indicating an increase in colonic motility. Restraint stress significantly increased the number of CRF-immunoreactive (IR) neurons in the myenteric plexus of the stomach (control: 0.65  $\pm$  0.15 vs. restraint stress: 4.73  $\pm$  1.76;  $P < 0.16$ ), and in the myenteric (control: 0.89  $\pm$  0.20 vs. restraint stress: 3.59  $\pm$  0.70;  $P < 0.01$ ) and submucosal (control: 3.56  $\pm$  0.32 vs. restraint stress: 6.85  $\pm$  0.23;  $P < 0.001$ ) plexuses of the colon. Conclusions: Acute restraint stress elevates CRF peptide expression in the enteric nervous system of the rat stomach and colon. Increased CRF levels in the stomach and large intestine may contribute to stress-induced alteration in gastrointestinal motility and fluid secretion, which lead to diarrhea and abdominal distress. (Supported by a UW-L Faculty Research Grant to S. Liu)



### **U.81 Perceptions of Relationship Conflict as Predicted by Adult Attachment and Self-Esteem**

Kelsey Jorgensen

Advisor: Casey Tobin, Psychology

Research on the attachment theory has contributed to a better understanding of the parental or caregiver relationship with their children. However, research on adult attachment and perceptions of relational conflict is minimal. This study looked at the relationship between adult attachment, self-esteem and romantic relationship conflict. Participants completed a questionnaire with measures for self-esteem, adult attachment, and perceptions of relationship conflict. Participants watched a video clip of relational conflict of a couple in a committed relationship. After video completion, the participants completed a questionnaire measuring their perceptions of the conflict. It is hypothesized that individuals with secure attachment will perceive relationship conflict as having fewer severe consequences when compared to individuals with insecure attachment who will perceive the conflict as having more severe consequences. In addition, it is expected that individuals with high self-esteem will view relationship conflict as having less severe consequences. Results may suggest the importance of attachment not only in infancy but also in adulthood. Data will be analyzed using correlation regression and between-group analysis. If my hypotheses are supported it will suggest that individuals with insecure attachment may need assistance in understanding the role of conflict in healthy relationships.

### **U.82 A Comparison of Test-Enhanced Learning and Self-Guided Study for the Short-Term Recall of Word Pairs**

Vanessa Schwartz, Maryam Faterioun and Rachel Stoeffler

Advisor: Bianca Basten, Psychology

The purpose of this study was to compare the effectiveness of various study methods. Roediger and Karpicke (2006) found that immediate testing following reading a passage resulted in better long-term retention of the text than studying the passage repeatedly. However, in a short term test, Roediger and Karpicke found that repeated studying was more effective than being tested and receiving feedback. These results contradict a prominent concept in cognitive psychology, known as the “testing effect”. This concept theorizes that taking a test and receiving feedback improves performance on subsequent tests. This has been supported by the results of previous studies, but much of this research focuses on the long-term recall of information. The current study compares the short-term recall performance of participants that have engaged in various combinations of test-enhanced learning and self-guided study. We are currently collecting data from approximately 60 undergraduate students. Participants are randomly assigned to one of three groups and instructed to memorize 30 Swahili words and their English translations. Using the computer-based interface PsyScope, participants begin by studying the word pairs individually for a total of ten minutes. After this, each participant completes two seven-minute sessions of either testing (with feedback) or studying. Between each session, participants complete a three minute mental math distracter task. Finally, all participants complete a ten-minute final recall test. We used a one-way ANOVA test to analyze the effect of study method on short-term recall. Preliminary analyses showed a difference between those participants who were tested more often and those who were prompted to study the word pairs. Specifically, we found trends to indicate that participants who completed more practice tests achieved higher final test scores than participants who engaged in more study sessions. These findings suggest that the testing effect exists in both long-term and short-term recall of information. Roediger, H., & Karpicke, J. (2006). Test-enhanced learning: Taking memory tests improves long-term retention. *Psychological Science*, 17(3), 249-255.

### **U.83 Ischemic Damage in Hibernating Ground Squirrels**

Leah Morgan, Kelsey Nuernberger and Jenna Kerr

Advisor: Scott Cooper, Biology

To study hypoxia, ischemia, decreased metabolic demand and atrophy many researchers have turned to small, hibernating mammals such as the ground squirrel. During hibernation their heart rates drop to 3-5 beats per minute, but they do not seem to have any heart damage. If we can determine how they do this, they would be a good animal model organism to learn about human heart disease. In our research we are looking for signs of heart damage while in hibernation. These include elevated levels of white blood cells due to inflammation, collagen deposition, coagulative necrosis and signs of pulmonary emboli. We have taken the heart and lungs from hibernating, non-hibernating and a control group of ground squirrels to look for and compare ischemic damage. To do this we fixed and cut tissues and stained them. We are currently working with a pathologist at Gundersen Lutheran hospital to develop a scale to quantify ischemic damage in the tissue sections.

#### **U.84 Investigating the Structural Stability of a Short Helical Peptide Composed of Aib and Lys Amino Acids**

Kevin Larsen

Advisor: Adrienne Loh, Chemistry

The function of a protein is determined mainly by its secondary and tertiary structure. One secondary structure essential to antibiotic peptides is a positively charged helix. Peptides composed of the dialkylated amino acid Aib (alpha-aminoisobutyric acid) have been found to fold into 310 helices, even when in short chains. This is due to the dialkylation (two methyl side chains) of this amino acid, which creates a large amount of steric hindrance. Previous studies have shown that Aib peptides with sequentially inserted uncharged monoalkylated amino acids have reduced steric hindrances in regions adjacent to the insertion. This reduced hindrance may allow hydrogen bonding solvents to disrupt the stabilizing hydrogen bonds that hold together the helical structure of the peptide. Reduced stability of these bonds results in fluctuations in the helical structure, which may affect the peptides antibiotic activity. Often these helical fluctuations can be detected using CD and NMR spectroscopy. Our study will focus on a short peptide chain model composed of Aib with two neighboring charged lysine amino acids substituted into it. We are interested in investigating the effects, especially those relating to charge repulsion, these two positively charged side groups will have on the peptide's helical structure. Structural and helical properties will be studied using CD and NMR spectroscopy in a variety of solvents and temperatures. These results will then be compared to those of an uncharged analog.

#### **U.85 Testing the Repeatability of Grassland Community Responses to Simulated Climate Change**

Sarah Graf

Advisor: Meredith Thomsen, Biology

To uncover possible implications of the predicted change in precipitation for an experiment was established in 2001 with a treatment that simulated the predicted extended rainy season by adding additional water from April-June, during the start of California's dry season. Based on the results of this manipulation, it was proposed that the increased growth of nitrogen fixing-forbs (N-fixers) in the first year of the experiment facilitated the increased growth of annual exotic grasses in the following years. This facilitated growth enabled the annual exotic grasses to out-compete wildflowers within the field, thus leading to an overall change in the composition of the plant community. When prominent results, such as these, are obtained, testing the repeatability of the experiment becomes necessary. My project tested the repeatability of the 2001 experiment through the establishment of a new experiment which specifically examined the effects of N-fixer growth and the spring addition of water. A quantitative evaluation of the difference between N-fixer growth among the control vs. spring treatment plots (as of May 2010) was conducted to verify how repeatable the 2001 experiment would be. There were no significant differences in N-fixer biomass between the control and treatment plots at the May sample point, but significant differences became apparent in sampling conducted at the end of the spring water addition period (data not shown here). Variation in the details of plant responses to repeated treatments most likely reflected the extreme difference between the natural rainfall California received in each year respectively. However, how the natural rainfall pattern will affect the overall outcome of the experiment, thus determine if the 2001 experiment will be repeatable, will require more time and data analysis to conclude.

#### **U.86 The Effects of Texting on Memory Recall and Comprehension**

Rebekah Smith and Brooke Blaha

Advisor: Bianca Basten, Psychology

The purpose of this study was to test the effects of text messaging on recall and comprehension during a simulated class lecture. Previous research has focused on the negative effect of texting on the texter's ability to perform other tasks, such as driving or attending to information (Hosking, Young & Regan, 2009; Nemme & White, 2010). There is little research, however, on the effect of texting on individuals in the vicinity of the texter. A recent study on the distracting effects of conversations, suggested that hearing a "halfalogue" (i.e., one side of a phone conversation) was more distracting to individuals than hearing an entire conversation because we are using cognitive resources to fill in the missing part of the conversation (Emberson, Lupyan, Goldstein & Spivey, 2010). This might also be the case for texting conversations. / To test this idea, participants were asked to listen to a simulated class lecture that was presented in a combined PowerPoint and auditory format. Half of the participants performed the task without interruption while the other half performed the task while one of the researchers both sent and received text messages. At the end of the lecture, participants were asked to complete a brief quiz. We obtained IRB approval and data collection will conclude shortly. Based on preliminary data and findings of previous research, we expect that being distracted (having another person texting) while listening to a class lecture will negatively affect the participant's memory recall and

comprehension. If our findings are correct, this could implicate that allowing the sending and receiving of text messages during classroom lectures may not only affect the texter, but also hinder other student's ability to fully absorb presented material. References: Emberson, L., Lupyan, G., Goldstein, M. & Spivey, M. (2010). Overheard cell-phone conversations: When less speech is more distracting. *Psychological Science*, 21(10), 1383-1388. / Hosking, S., Young, K., & Regan, M. (2009). The effects of text messaging on young / drivers. *Human Factors*, 51(4), 582-592. / Nemme, H., & White, K. (2010). Texting while driving: Psychosocial influences on / young people's texting intentions and behaviour. *Accident Analysis and Prevention*, 42(4), 1257-1265. /

### **U.87 Synthesis of 2-Fluorobiphenyl Chromium Tricarbonyl Isomers**

Sondra Buechel

Advisor: Curtis Czerwinski, Chemistry

Haptotropic rearrangements are the movement or sliding of a metal fragment, in this case  $\text{Cr}(\text{CO})_3$ , between two aromatic rings bonded to each other within the same molecule. Haptotropic rearrangements are important because molecules that can undergo this rearrangement have the potential to be used in molecular devices, molecular wires, and molecular switches. Our group has been working with substituted biphenyl chromium tricarbonyl compounds to explore the rates of these arrangements, and previously our group has developed molecules that can be used to explore the movement of  $\text{Cr}(\text{CO})_3$  from an electron-neutral to an electron-rich ring using an  $-\text{NH}_2$  substituted compound. Now we are working on using a  $-\text{F}$  substituted compound. I am interested in this compound because the smaller size of the fluorine molecule allows probing of the steric vs. electronic issues. We are trying to synthesize the fluorine-substituted compound because this will show the rearrangement in the other direction, which is to move the  $\text{Cr}(\text{CO})_3$  from an electron-poor ring to an electron-neutral ring. We have synthesized the thermodynamic isomer and I have previously tried to synthesize the kinetic isomer by running shorter reaction times and by running the crude mixtures through chromatography. This process didn't work, so I tried to synthesize the bromofluorobenzene chromium compound so that Suzuki coupling could be used. This also did not work, so the focus for this semester is to use a tributyltin replacement method in order to synthesize the bromofluorobenzene chromium compound. This poster will be discussing the past attempts and the results of the tributyltin replacement method.

### **U.88 Identification of Factors that Impede Student Learning of Metabolic Principles in Biochemistry**

Ashley Seidler and Mary Sackmann

Advisor: Sandra Grunwald, Chemistry

An important component of any biochemistry course is the study of metabolism, specifically how the body uses sugars, fats and protein for energy; however, many students struggle with learning this aspect of biochemistry. Analysis of 4 semesters of exam grade information from UW-La Crosse's Survey of Biochemistry course shows consistently low class averages on at least one of the two unit exams devoted to metabolism and an extremely wide range of student performance on these exams, sometimes ranging from a low of 19% to a high of 100%. The focus of this research project is to determine the factors that lead to this decreased success in some students. Assessment questions were developed to analyze: 1) students' basic organic chemistry knowledge, 2) students' ability to make connections between molecule names and structures, and 3) students' ability to apply basic organic chemistry and knowledge of chemical structures to chemical reactions in metabolism. Twenty students' oral and written responses to the assessment questions were captured using the Camtasia software program. Performance on the assessment questions were analyzed versus their success in the metabolism section of the course. The research results will be used to make informed curricular changes that ultimately improve student learning of metabolism in the context of biochemistry.

### **U.89 Surviving an Outbreak of Zombiism**

Cassandra Jens

Advisor: Robert Allen, Mathematics

Mathematical modeling of epidemics has grown increasingly important in recent years. Such models can predict how quickly a disease will spread through a population. The typical model used to describe the spread of an epidemic is the SIR model. This model uses a linear mass-action transmission, which assumes the transmission of the disease is proportional to the density of susceptible and infected populations. In their 2009 paper, Smith, et al. used SIR models to study the spread of a zombie epidemic through a population. Their models show that the only stable equilibria result in the human population decreasing to zero. We show that by considering a nonlinear mass-action transmission, the spread of the zombie infection can be survived. Stable equilibrium solutions exist for which the zombie population

decreases to zero. The nonlinearity in the mass-action transmission can account for differences in the populations. Through a bifurcation analysis, we were able to determine when human survival is possible in the models. This analysis can be used to determine the appropriate level of preparedness to stave off a zombie infection.

#### **U.90 Pissed Drunk: The Effects of Anger on Binge Drinking Behavior**

Catherine Langdon and Nicolaas Van Oss  
Advisor: Ryan McKelley, Psychology

Researchers have studied everything from rock climbing to financial decision making with the goal of understanding what factors influence the phenomena of risk taking. While researchers have identified specific emotional states---namely anger---that have an immediate effect on risk evaluations, little research has attempted to generalize these findings to real world examples of risk taking behavior. Under the supervision of the University of Wisconsin -- La Crosse Psychology Department, we conducted research that focused on identifying personality features (such as a tendency to act impulsively when angered) that predict binge drinking behavior (a real world example of risk taking). One hundred participants were randomly assigned to a neutral or an angry emotional state. After the emotional states were induced through a nature video (neutral emotional state) or a frustrating mock jury scenario involving two confederates who resist consensus (angry emotional state), participants completed the State-Trait Anger Expression Inventory (STAXI-2), the Balloon Analogue Risk Task (BART), the Barrett Impulsiveness Scale (BIS-11), and a questionnaire on their alcohol consumption. Correlational and regression analyses will be used to explore the relationship among the primary variables. Based on a preliminary data analysis of participants' state anger scores, there is a significant difference for participants in the angry condition and those in the neutral condition. We predict that participants who exhibit a significant increase in risk taking while in an angry emotional state will be more likely to engage in binge drinking behavior. A confirmation of our hypotheses would help to generalize previous research on emotional states and risk taking behavior to a real world example that harmfully affects the college population.

#### **U.91 Preliminary Report on the Pammel Creek Site: Feature 167**

Amanda Bailey  
Advisor: Connie Arzigian, Mississippi Valley Archaeology Center

The Pammel Creek site (47Lc61) is located at the south end of the city of La Crosse adjacent to Pammel Creek and a backwater slough of the Mississippi River. Pammel Creek is an Oneota culture site and was occupied during the 15th century. The site itself has gone through recent developments from a city park into a large artificial sedimentation basin channelizing the creek. Excavations have been done at this site in 1983 and the 1988-89 field season Feature 167 is a hearth that was excavated in 1989. Floral analysis has been done on the different zones within the hearth and compared to one another. This type of research shows the different usage of the hearth and the seasonality of this particular feature

#### **U.92 The Effects of Societal Versus Professor Stereotype Threats on Female Math Performance**

Melannie Tate and Lauren Byrne  
Advisor: Bianca Basten, Psychology

Psychological research has explored the effect of stereotype threat on women in the domain of mathematics and science, as research has indicated that women have consistently underperformed on the mathematical sections of standardized exams (Good, Aronson & Harder, 2008). Stereotype threat is "being at risk of confirming a self-characteristic, or negative stereotype about one's group" (Steele & Aronson, 1995, p.797). In regard to standardized testing, stereotype threat only has an effect when test items are considered to be difficult and when participants identify highly with a domain, such as mathematics (Keller, 2007). The current study involved female, freshman undergraduate students at the University of Wisconsin – La Crosse, randomly assigned to one of three groups. The two experimental groups were exposed to the stereotype threat (i.e., "Females are not good at math"); however the source was either attributed to a professor or societal views. The third group was the control group and did not receive the stereotype threat. All three groups completed questions from the math section of the SAT as well as a questionnaire assessing how highly they identified with the domain of math. High math identifiers were considered individuals who believed they were both good at math and reported it was important for them to do well in math. We hypothesized that professors would be the more salient group and would have a greater effect on the participant's performance when compared to those who received the threat attributed to society. This research explored the role that the source of the stereotype threat had on standardized testing. Potential negative consequences of stereotype threat on female college students include reduced performance due to anxiety (Steele & Aronson, 1995), however continual stereotype threat can lead to greater long term

problems including possible disengagement from pursuing mathematical-related careers. Preliminary results are still inconclusive.

### **U.93 Anatomical Parameters from Knee Radiographs**

Chase Hanson and Jordan Rudolph

Advisors: Thomas Kernozek, Health Professions and Robert Ragan, Physics

Medial and lateral tibial plateaus were measured from knee radiographs of 22 females. These plateaus were taken radiographic images from a controlled stance that provided a sagittal view of each knee from the medial side. Using imaging software, the tibial axis was first defined. Two circles were used to create a line that bisected the tibia. The anterior posterior tibial slope was calculated with reference to this tibial axis. Both the medial and lateral tibial slopes were measured on each radiograph. The mean lateral tibial slope was consistently larger than the medial. The medial and lateral tibial plateaus averaged out to be  $8.1^\circ$  and  $10.0^\circ$  respectively. Reliability tests were used to find out the reproducibility of our data by two independent examiners. Intraclass correlation coefficients were used as an index of measurement reliability. The medial slope had a reliability coefficient of .837, while the lateral slope had a coefficient of .903. The Patellar tendon moment arm and angle were also measured on these same radiographs. Patellar tendon moment arm was measured by referencing the tibiofemoral contact point (TCP). The TCP was found by identifying the most inferior points of each femoral condyle and the midpoint (contact point) of these two. Variations of structures lead to inaccuracies when determining landmarks for each parameter. After comparing the patellar tendon moment arm and angle measures, it was determined that there is a negative relation between these two parameters. This may be due to both the patellar tendon moment arm and angles being largely dependent on the measurement of the tibial axis.

### **U.94 100 Bullets and America's New Class**

Eric King

Advisor: Bryan Kopp, English

The Trust, from Brian Azzarello and Eduard Rizzo's 100 Bullets, is a body consisting of thirteen families that control the same number of divisions of the American landscape. With the application of Louis Althusser's framework, the Trust – as representational of the ruling elite – plays an integral role in the reproduction of the means of production. The traditional topographical framework places the responsibility of the reproduction of the means of production in the hands of the Superstructure (both the Repressive State Apparatus and the Ideological State Apparatus), and through violence and ideology, this body ensures the continuation of the conditions of production. The Trust, as a representation, shows that the ruling class is responsible for the reproduction of hegemony or dominant ideology in the lower classes. This move is made by juxtaposing the Trust against representatives of the lower class – Spain and his network of drug trafficking. By showing the reproduction of the dominant ideology in representatives of the lower class, 100 Bullets shows that the ruling class plays an integral role in the reproduction of dominant ideology and the conditions of production.

### **U.95 Morphological Investigation of Annealed Zinc Films**

Benjamin Oleson

Advisor: Seth King, Physics

This project sought to increase the understanding of fundamental properties of the transparent conducting oxide materials needed to improve solar energy device efficiency. Specifically, this experiment focused on the reality of Zn and Zn alloys potential to replace the expensive semiconductor layer of photo voltaic cells currently used.

### **U.96 Examining Protein Localization in Trypanosoma Brucei Flagellum and Kinetoplast**

Lindsey Brown, Cayla Duffy and Stephanie Gray

Advisor: Nicholas Downey, Biology

Trypanosoma brucei causes African Sleeping Sickness in sub-saharan Africa. Trypanosomes have a unique structure within the cell called the kinetoplast (kDNA). The kDNA is connected to the flagellum of the cell by a very strong link. Little is known about this link. We have used bioinformatics approaches to predict proteins that may be involved in this connection. Our initial search came up with five candidate proteins. We will be localizing these proteins within T. brucei. We are constructing cells that are expressing a “tagged” version of each protein. This tag allows us to

visualize the protein within the cell with immunofluorescence. Knowledge of where these proteins are found within the cell will provide important cues as to their functions within the cell. We have screened clones using western blotting to identify those expressing the HA tag. Localization of several genes will be presented.

#### **U.97 Trophic transfer of Methylmercury in the Lower Food Webs of Six National Parks of the Upper Midwest**

Katie Challis and Ryan Lepak  
Advisor: Kristofer Rolffhus, Chemistry

Methylmercury bioaccumulation occurs mainly between the aqueous and particulate phases in aquatic systems. However, the lower food webs of aquatic systems have been under-characterized. In a study of 30 lakes in six U.S National Parks as part of Great Lakes Inventory and Monitoring Network, we examined the water bodies for total and methylmercury content in water, seston, surficial sediments, benthic macroinvertebrates (dragonfly larvae) and bulk zooplankton in relation to environmental parameters. Prey fish and predatory fish are also being analyzed within these systems for comparative purposes. Analyses are continuing and current results indicate that aqueous concentrations (0.036-2.32 ng L<sup>-1</sup>) show correlations most strongly with dissolved carbon ( $r^2=0.42$ ) and less with pH and sulfate ion. Filtered water (0.45 micron) samples are on average 33% lower than the unfiltered counterparts. The results from the lower food web will be presented with data from 10 previous years at multiple National Park sites to provide a look at contamination and controls on the trophic transfer of methylmercury within the Great Lakes region.

#### **U.98 The Magic Behind Character Transformation**

Andrew Appold  
Advisor: Beth Cherne, Theatre Arts

This grant will fund research on the topic of Character Transformation on stage, culminating in the unrealized design for the onstage transformation of Dracula into a bat. Funds will support a trip to work with a professional designer, Jeff Slack, who designs such transformations for Disney World in Orlando, FL. Combining this experience with my knowledge and experience with puppetry, and research into special effects for live theatre, I will present my design to theatre faculty and at the Celebration of Undergraduate Research in Spring 2011.

#### **U.99 How Big Can We Go?**

John Nehls  
Advisor: Ted Wendt, Mathematics

In the extreme sport of snowboarding, athletes are constantly on the hunt to invent the next big stunt. In order to accomplish this, snowboarders must push the limits of the sport to the edge. This often means redefining what was previously considered to be possible, including exploring ways to increase their vertical air. When examining the popular snowboarding halfpipe terrain, increasing the vertical air a rider can reach once leaving the walls of the halfpipe would increase the time the snowboarder spends in the air, creating new opportunities to beat their competition. This paper will model the optimal design for a halfpipe terrain in order to maximize vertical air, and, simultaneously, the ability to achieve maximum twist. These results are then constrained to be within the realm of what is possible for a human to experience. Two models are implemented together to attain this: the Pendulum Model with Linear Dampening and the Projectile Motion model. Through the use of these models, as well as the necessary constraints, the design of the current halfpipe was modified to allow an expert snowboarder to reach the maximum vertical height.

#### **U.100 Prioritizing Power and Performance**

Joseph Sperlak and Daniel Shaefer  
Advisor: Dennis Kline, Exercise and Sport Science

The field of Strength and Conditioning is continuously evolving with new research and further investigation of the human body. The underlying principle of Strength and Conditioning is to develop the body with a desired outcome in mind. There are, however, many different methods that can be applied to reach such a goal. Thus, the question becomes what is the most efficient method? Although this question must truly be answered on an individual basis, a comprehensive assessment of the various methods can be done and analyzed to determine common trends among different exercises. This study explores that question through the context of the jump squat exercise. This comparative

study takes three different methods of the jump squat and compares performance related factors among the three. More specifically, the study examines 40 participants through one trial of each jump squat variation. It then compares the variations in terms of power output through the use of a force plate. The three methods of jump squat that will be examined include the use of a barbell, two dumbbells, or a weighted training vest. Altogether, there are many different training practices and philosophies that may be prescribed in any workout regimen. This study examines the three jump squat methods and compares their different performance attributes to suggest an optimal training prescription.

#### **U.101 Synthesis and Structure of a Model Peptide Antibiotic**

Theodore Savage and Luke Oetzel  
Advisor: Adrienne Loh, Chemistry

Helices are among the most important and stable conformational shapes seen in proteins, making them an essential target for the development of pharmaceutical products, particularly antibiotics that are more resilient to bacterial resistance. Our goal is to synthesize a stable helical octamer (an eight residue peptide), and then determine how well it maintains this structure in different solvents and at different temperatures. The primary structure (the sequence of amino acid building blocks) is a key factor in the stability of the secondary structure. In this study we utilize an amino acid called aminoisobutyric acid (Aib), which because of the bulky side chains (causing steric hindrance) tends to form stable helices even at very short peptide lengths. We are adding two alanine (A) amino acids that are spaced one turn apart in order to observe the effects of reduced steric hindrance in isolated locations. By combining these two amino acids in different sequences we hope to determine the sequence that will have the greatest stability. Later, the physical properties of this peptide can be compared with similar octomers with cationic (positively charged) amino acids in place of the alanines. We are synthesizing the peptides by forming linkages between Aib dimers and alanine monomers. The identity of each intermediate, as well as the final product, is analyzed by NMR spectroscopy and thin layer chromatography (TLC). The structure of the final peptide will be characterized by NMR. /

#### **U.102 Analysis of Light Chain Dynein Function in Trypanosoma Brucei**

Kayla Wasemiller and Christa Berndt  
Nicholas Downey, Biology

Trypanosoma brucei is a protozoan parasite that has a single flagellum. This flagellum is unusual in that it is not “free” but attaches to the length of the cell. This attachment leads to the characteristic auger-like movement of the cell. Cells have been shown to tumble briefly before heading forward in “productive” motion. Surprisingly, the flagellum is also essential for cell division and has been shown to be the driving force for cytokinesis. / Because of these essential functions we decided to investigate a protein involved in the structure of the flagellum. A similarity search indicated gene Tb927.10.1130 was a light chain dynein found in the axoneme of the flagellum. Initial localization of the protein indicated that this was correct. We have used an RNA interference (RNAi) methodology to infer the function of this protein. We have transfected cell lines that can be induced to carry out RNAi by the addition of tetracycline and we have described a growth change when RNAi is induced. We describe features of this phenotype. /

#### **U.103 Consumer-Driven Nutrient Recycling Between a Stream-Dwelling, Keystone Herbivore and Its Periphyton Resources**

Robert Mooney  
Advisor: Eric Strauss and Roger Haro, Biology

The caddis fly, *Glossosoma intermedium*, is a keystone herbivore that inhabits many Midwestern streams in high abundance. These larvae graze on algae covering cobble particles in small streams and can significantly reduce algal biomass. When the algal resources on the cobble reach low levels, *G. intermedium* has been observed grazing on the stone cases of sympatric *G. intermedium* (Cavanaugh et al., 2004). This grazing system may represent consumer-driven nutrient recycling. To assess hypothesis, the Carbon (C), Nitrogen (N), and Phosphorus (P) ratios between the stream water, the *G. intermedium* larvae, its excretion, the streambed algal community, and the algal community adhering to the cases of *G. intermedium* are being investigated. Throughout autumn and winter 2010/2011, larvae were collected from three Driftless Area streams in Wisconsin. At each site, three cobbles from a random transect of a selected riffle were collected. To collect larvae excretia, ten larvae from each cobble were removed from their cases and incubated in vials containing 40 mL of pre-filtered stream water for 2 hours. This incubation was carried out at the sample site. After the incubation, the larvae, their cases, and vials containing stream water and stream water plus excretia were prepared for transport to the UW-La Crosse River Studies Center laboratory. Algae was also collected from the three cobbles and

transported to the laboratory. The C and N elemental analysis for particulate parameters was done using a Costech CHN analyzer, dissolved C was analyzed using a Shimadzu TOC analyzer, and dissolved N and all P analyses were completed using wet chemistry techniques following standard methods (APHA 2005). *Glossosoma intermedium* is a unique part of many Midwestern streams because it can regulate algal community structure and abundance by extreme grazing on cobbles, but also by creating a nutrient enriched surface for algal colonization on their cases. This surface may serve as an important supplemental grazing resource for this caddisfly.

#### **U.104 An Analysis of Floral Remains and their Correlations to Seasonal Movement at the Sand Lake Site**

Ashley Schultz

Advisor: Constance Arzigian, Mississippi Valley Archaeology Center

The Sand Lake site has been known for many years as a significant Oneota site dating to between 1300 and 1650 A.D. in Onalaska, Wisconsin. A large amount of floral remains have been recently collected but until recently very little of the sample has been analyzed. Through this study more of the charred floral remains from features of the site have been analyzed and seed types were identified. The analyzed features have been compared with past analysis at this and other Oneota sites in the region to determine what seasons the site was occupied. At other sites in the region, occupations during the winter are scarce, but preliminary work at Sand Lake suggests that it might have a more substantial winter occupation. This preliminary research will provide support towards answering many questions surrounding plant use among the Oneota and towards the question of seasonal movement.

#### **U.105 Synthesis of a Metal Binding Amino Acid- Solid Phase Peptide Synthesis-Compatible Hydroxamic Acid**

KaWai Hui

Advisor: Heather Schenck, Chemistry

This study focuses on the practical usage of SPPS to synthesize  $N\delta$ -acetyl- $N\delta$ -hydroxy-ornithine (Aho) containing peptides. Aho is a common hydroxamic acid that appears in molecules called siderophores. Siderophores are iron binding molecules produced by many microbes to obtain ferric iron. This type of molecule has been used for antimicrobials, anticancer drugs and in treatment of iron overload disease. Thus, it is an attractive synthetic target in many industries and scientific studies. Siderophores are sometimes peptides and could possibly be synthesized via solid phase peptide synthesis (SPPS). SPPS is the state of the art for peptide synthesis due to its speed and high yield, as well as its ability to generate libraries of related structures (combinatorial chemistry). However, to date hydroxamic acids have not been used in SPPS due to their difficulty of synthesis and protection needed for the side chain. Demonstration of SPPS compatibility would open the door to new hydroxamate peptide synthesis in a rapid yet inexpensive way. An SPPS compatible version of Aho was prepared by modifying an existing synthesis of Aho. This Aho will be combined with commercially available amino acids using SPPS and be exposed to all conditions associated with SPPS. The stability and characteristics of Aho during and after the removal of protecting groups will be tested using NMR. The resulting peptide will be characterized and studied using IR, NMR and GC-MS.

#### **U.106 A Bayesian Method to Assess the N-Mixture Models Used in the Estimation Of Animal Abundance**

Jason Rubbert

Advisor: Sherwin Toribio, Mathematics

Estimating animal abundance is a major issue within wildlife statistics. The two most popular sampling methods through which the population size of animals is estimated are the capture-recapture method and the simple count method. Although the capture-recapture method has extensive literature, it can sometimes be difficult to implement, especially when the target animals are not easy to capture. Obtaining data to estimate animal abundance using the simple count method is much easier to implement, and as a result is gaining popularity in animal monitoring procedures. In the simple count method, researchers visit randomly selected sites several times and record the number of target animals they observed during each visit. In 2004, Andrew Royle proposed a new method to estimate animal abundance using simple count data and the N-mixture models. In 2006, Royle and Dorazio discussed the advantages of using a Bayesian approach in the estimation of model parameters. However, these procedures are only valid if certain model assumptions are satisfied. If some of these assumptions are violated, then the estimates obtained from these procedures can be very biased. Currently, no statistical procedure exists that can determine when the N-mixture model is suitable for the observed data. In this presentation, the effectiveness of the Bayesian posterior predictive model checking method (using the chi-square statistic as a discrepancy measure) to assess the goodness-of-fit of the N-mixture model to the observed data will be discussed.



### **U.107 Awareness Through Printmaking: Human Threats Imposed on Cambodian Coral Reef Ecosystems**

Chelsie Heidke  
Advisor: Joel Elgin, Art

During my intensive two week volunteer program with a Cambodian based coral reef conservation group, I was able to dive and study coral reef species in their natural habitat, along with the stresses they face due to human impacts. I was able to work with two onsite marine biologists who guided me through the different reef species and current coral diseases specific to the surrounding area of Koh Rong. While diving, I was able to identify different species and ways that the reef was impacted. I also used dive slates to make quick underwater drawings and notes, which I later transferred to a note book. Upon my return home I used this notebook as a reference to make my own book of prints about the damage of the reef I had observed while diving. I decided to use the medium of printmaking to address these issues, because of its ability to reproduce images and its history of social responsibility. The main problems I focused on specifically were; overfishing, destructive fishing practices, and sewage runoff. Many of these issues have already had an impact on the reef of Koh Rong, and in turn are more and more affecting those that live in the surrounding areas.

### **U.108 Atomic Characterization of a Helical Model Peptide for Antibiotic Purposes Using Nmr And Cd Spectroscopy**

Emma Sabel  
Advisor: Adrienne Loh, Chemistry

The scientific community is investigating helical peptides in an attempt to produce antibiotics to fight diseases that are caused by microbes resistant to current antibiotics. The ability of helical peptides to permeate the membranes of bacteria cells make them more effective at avoiding resistance than current drugs. When positively charged, the peptides are attracted to the negatively charged bacteria cell membranes, effectively selecting for the harmful microbes and reducing the risk of attacking the cells of the body. The model antibiotics in this study are based off an 8 amino acid chain, composed primarily of alpha-aminoisobutyric acid (Aib) residues, with varying amino acid substitutions. This specific amino acid is sterically hindered in such a way that it nearly always forms a helix structure when in a peptide. The peptide currently under study (termed "AA45") consists of a peptide sequence of  $(Aib)_3(Ala)_2(Aib)_3$ , where "Ala" refers to the amino acid alanine. I am aiming to determine the effect of the placement of alanine, a smaller amino acid than Aib, on the helical structure of the peptide. Nuclear magnetic resonance (NMR) spectroscopy, which gives detailed information on the interactions between hydrogen atoms in molecules, is being used to produce an atomic-level picture of the molecule at various temperatures and in various solvents. Circular dichroism (CD) spectroscopy is being used to determine the effects of temperature and solvent on the overall helical structure. Once this study is complete, the results will be compared with the characterizations of other helical peptides to determine the most stable and effective peptide composition to be used in antibiotics.

### **U.109 The Missing Link: An Examination of Skin Clothing Production**

Kassie Praska  
Advisor: Connie Arzigian, Mississippi Valley Archaeology Center

Deer hides are one of the most commonly used materials for clothing production among the Prehistoric Northern Great Plains and Eastern Woodland peoples. Deer hides offered protection from harsh weather conditions, and were comfortable all year round. Richard Michael Gramly's 1977 article "Deerskins and Hunting Territories: Competition for a Scarce Resource of the Northeastern Woodlands," produced an estimate of 3.5 hides per person per year, a figure that is widely cited in the anthropological literature. Yet the article provided no supporting data. This investigation seeks to find that data. Measurements were taken of known clothing articles to determine surface area, and these were compared with the surface area of average sizes of small, medium, and large deer hides. Comparing the surface areas allowed for an accurate estimation of the number of deer hides needed by both a man and woman per year for an appropriate climate wardrobe. Such information can be vital in interpreting prehistoric and historic hunting patterns, with significant social and ecological implications.

## **U.110 Identifying Novel Plant Secretory Genes Using Insertional Mutagenesis**

Ryan Bates and Josh Lewandowski  
Advisor: Anton Sanderfoot, Biology

Plants are one of the most important biological systems on this Earth. They surround and envelope our lives, supplying us with the raw materials we need for food, shelter and clothing. Our research focuses on the secretory pathway in plants. As in all cells, secretion of proteins is essential for cell division, reproduction, remodeling of structure and as a defensive mechanism from pathogens. Yet, it is known that many aspects of the secretory pathway are different in plants when compared to animals or fungi. Understanding more about plant secretory pathways could allow us to reap such benefits as improved crop yields and lowering disease potential, leading to a greater quantity of food and fiber production. // We are working to identify novel plant secretory genes by random insertional mutagenesis in the model plant *Chlamydomonas* with a DNA fragment called PAR. PAR lands randomly in the genome of *Chlamydomonas*, possibly damaging genes involved in protein secretion, and at the same time, making cells resistant to the antibiotic paromomycin. Only colonies that are resistant to paromomycin survive and are screened for their ability to successfully secrete a protein called arylsulfatase (ARS) with a colorimetric assay. The colonies that fail to secrete ARS activity are then put aside for a procedure called Tail PCR, which can identify where the PAR has been inserted through comparison against the genome of *Chlamydomonas* using bioinformatics. Using that information we are able to determine which gene is responsible for the block in secreted ARS activity, and possibly identify a novel gene required for the general secretory pathway. Through a continuing screen of thousands of potential mutants, we have identified a few potential secretory mutants and continue to identify more in hopes of better understanding how the plant secretory pathway is distinct from that of animals and fungi.

## UNDERGRADUATE ORAL PRESENTATION ABSTRACTS

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### **UR.1 A Co-culture Approach for Identifying Bacteria in the Intestinal Tract of *Arion fasciatus***

Philip Strandwitz

Advisor: Bonnie Bratina, Microbiology

An estimated one-percent of bacteria found in the environment are able to be isolated in the laboratory – a problem that has hindered microbiologists for decades. This means that while many great discoveries have come from studying bacteria, our current understanding of these microorganisms is just the tip of the bacterial iceberg. This includes such things as antibiotics and our present knowledge of mechanisms of infection. It has been hypothesized that this inability to isolate and cultivate all bacterial species is due to symbiotic relationships, which provide growth factors currently not found in laboratory media. Recently, studies have found a group of iron-chelating molecules, siderophores, are one such growth factor. Mimicking that symbiosis using co-cultures as well as adding diffusible bacterial compounds may allow us to overcome this cultivation problem. In this experiment, several methods were used to isolate novel bacteria from the intestinal tract of *Arion fasciatus*, an aquatic slug found by the UWL Biology department. This included utilizing a co-culture system by creating diffusion chambers out of steel washers and polycarbonate membrane filters, simulating a symbiotic environment, as well as adding *Escherichia coli* K12 filtrate and the siderophore enterobactin directly to the growth medium.

### **UR.2 An Economic and Financial Analysis of the United States Ethanol Industry**

Brandon Miles

Advisor: Kathryn Birkeland, Economics

The current United States ethanol mandate requires the nation consume 12 billion gallons of ethanol blended fuel in 2010 and increases the amount to 36 billion gallons of ethanol in 2022. The federal government is currently subsidizing domestic ethanol producers and blenders 45 cents for every gallon of ethanol produced, while levying a tariff tax on foreign ethanol imports at 54 cents per gallon. Additionally, the Environmental Protection Agency on October 13th issued a partial waiver that established a federal plan allowing the amount of ethanol at fuel pumps to increase from E-10, which is 10% ethanol by volume, to E-15 in cars that were manufactured later than 2006. Even with the aid of the current subsidy, which is set to expire at the end of 2010, several large domestic ethanol companies are in danger of or have already entered bankruptcy claims because the increasing cost of corn has caused their costs to outweigh the revenue received by ethanol sales. A macroeconomic model will be used to predict changes in the industry and economy that result from potential policy shifts. This model simulation will include an analysis of the social welfare consequences of the current and proposed policies. Financial analysis of the ethanol industry and corn prices will be used to analyze whether further production and protection of ethanol could be more detrimental than beneficial to domestic producers. This research aims to highlight some necessary conditions for our economy to continue to support a domestic ethanol industry that is able to supply the nation with the amounts of ethanol as set forth in the government mandate.

### **UR.3 Forty Years Later: The 1968 Edcouch-Elsa, Texas Student Walkout in the Generational Memory of a South Texas Chicana/o Community**

Sylvia Weathers

Advisor: Victor Macias-Gonzalez, History

This project studies archival sources and oral histories of participants in the 1968 Chicana/o student walkout that protested racist policies of the Anglo-controlled Edcouch-Elsa (Texas) School Board. It examines long-term effects the walkout had on its participants, the school district, and community at-large, particularly the impact of the walkout on the present generation. The walkout served as a catalyst for social, political, and cultural reform in the local school system. It became a marker in the community's memory and is remembered as the beginning of significant changes in the community.

#### **UR.4 Risk and Protective Factors of Juvenile Delinquency**

Megan Gosse

Advisor: Nicholas Bakken, Sociology and Archaeology

The purpose of this study was to determine what factors are the strongest predictors of juvenile delinquency and which of those factors have the most significant impact. The 2008 Delaware School Survey, a randomly selected survey of 5,636 11th graders, was used. Participants were asked to self report delinquency: damaging/destroying property, taking a weapon to school, taking part in a fight, stealing from a store, breaking into a car/house/other building, getting arrested; and drug use: drinking alcohol, smoking marijuana, and taking prescription drugs (for the purpose of getting high). Logistic Regression showed association with delinquent peers and having low self control had the greatest impact on delinquency, while association with delinquent peers and the use of prescription drugs with the intention of getting high had the greatest impact on drug use. Future policies should focus on family based interventions that are devised to target risk factors and should promote pro-social attachments to parents, friends, and education.

#### **UR.5 House of the People: Worker Solidarity in the Neighborhoods of Cochabamba, Bolivia**

Patrick Carthey

Advisor: Christine Hippert, Sociology and Anthropology

In the 1980s, the Bolivian government privatized its tin mining industry in order to accept loans from the World Bank after a global collapse in the tin industry. After thousands of miners were laid off with very little to no compensation, the miners migrated across Bolivia. In June, 2009, I conducted my research in Cochabamba during my ethnographic fieldschool as part of my Anthropology minor at UWL. The purpose of the ethnographic research was to see how migrants made sense of their lives after moving from the mines to the neighborhood of Juan XXIII. I lived with a host family for three weeks doing participant observation and collected six oral life histories acquired through semi-structured interviews. By continuing the tradition of working in public services, such as transportation, and maintaining relationships with former miners the migrants preserve their working-class identity and solidarity.

#### **UR.6 Accuracy of Robust Confidence Interval Methods with Skewed Data**

Ryan Haunfelder

Advisor: Barbara Bennie, Mathematics

The accuracy of the classic student's t confidence interval for a difference in population means decreases when used with samples taken from skewed distributions. The best performing alternative method uses transformations based on an asymptotic series expansion of the cumulative distribution of the parameter to eliminate the effects of skewness on interval accuracy. The history and theoretical development of the method will be discussed along with a comparison of its effectiveness at achieving nominal coverage probability to other methods using Monte Carlo simulation. Finally, I will share a new transformation that was developed through insight gained from simulation as well as theory. The method performs well in many situations where the reliability of the student's t method is unknown.

#### **UR.7 Exploring Methodologies in Foreign Language Learning Through the Use of Music and Technology**

Ellen Poeschel

Advisor: Jean Janecki, Modern Languages

The second half of the twentieth century initiated an era of technological developments that contributed to the expansion of communication across continents. As societies continue to advance their means of communication and technology, acquiring foreign languages becomes crucial to the economic, social, and cultural connections around the world. My essay will address several approaches to second language acquisition (SLA) such as the Grammar Translation Method which focuses on the translation of classical Greek and Roman literature, the Natural Approach that examines the natural progression in which children learn their first language, and the Total Physical Response Method that merges language learning with physical responses. Approaches to language acquisition began in the early 1900s and have continued to evolve and integrate different elements into their practices well into the 21st century. One element that my essay will focus on is the incorporation of music into teaching practices. Music can help make the learning process more enjoyable and can help facilitate success in learning another language. Two approaches that combine music into the language learning classroom are Suggestopedia, which tries to create a more relaxed state of mind in order to enhance learning by playing music in order to facilitate the retention of material and increase an individual's confidence

in learning, and the Contemporary Music Approach, which integrates a wide variety of musical genres with practical exercises while also focusing on good pronunciation. Incorporating technological programs, such as podcasting into the language-learning classroom can also successfully further an individual's acquisition process. Podcasts are segments that capture lecture, video or images and that can be used as additional resources to help students acquire a second language. In conclusion, my essay will demonstrate how music and technology can enhance second language learning by providing easy access to material, more opportunities to practice pronunciation or grammatical structures, and more information on the cultural and historical aspects of other countries.

#### **UR.8 Beyond Shakespeare: an Oriental reading on Akira Kurosawa's Ran and Throne of Blood**

Xinrui Shi

Advisor: Lalita Hogan, English

Akira Kurosawa is a world famous Japanese director. His two movies, Throne of Blood and Ran are regarded as among the best adaptations of Shakespearean plays: Macbeth and King Lear. Kurosawa transplants the Renaissance English tragedies into the Japanese Warring State period that not only revisits the eternal theme of human conditions, but also blends into the Oriental philosophy and religions from his Japanese heritage. Despite the Japanese settings and costumes, many critics and scholars focus more on the Shakespearean elements and tend to pay less attention to the Japanese side of the story. One reason is that the Japanese elements have worked too well with Shakespeare's plays. Quoting Kurosawa's own words on the making of Ran, the story of Montonari Mouri (16th century Japanese warlord) fused with King Lear's and that "he cannot draw any lines between Shakespeare's King Lear and his script." However, Kurosawa's intention is not simply to make one Shakespearean film, but to create a distinct work that grows out of both British/Western and Japanese stories. Although Kurosawa has successfully delivered his ideas by his mastery of shots and imagery that makes his films universal; the director's authentically Japanese identity and way of thinking has made some of his messages crucial in understanding his interpretations, but are inaccessible to Western authors. The meaning of names of characters and locations, the use of elements in Noh stage as well as the treatment of colors all play a subtle and significant role in delivering the director's ideas. In my research project, I will uncover the messages behind these elements and analyze the icons and symbolism that become part of the cinematic form of Throne of Blood and Ran, in hopes of providing a perspective that is better attuned to the Japanese roots of Kurosawa's Shakespeare adaptations.

#### **UR.9 Shaken and Moved: Posttraumatic Stress Disorder in Haitian Earthquake Survivors**

Kelsey Greenwood

Advisor: Dung Ngo, Psychology

Posttraumatic Stress Disorder (PTSD) is a disorder that affects victims of traumatic events. On January 12th, 2010, Haiti experienced one of the most devastating natural disasters in its 200 year history: it was struck by an 7.0 magnitude earthquake. Hundreds of thousands of people died and millions were displaced. When an individual experiences a trauma of this intensity, the chances of them suffering from a psychological disorder are significantly high. The purpose of the research project was to assess the prevalence of PTSD in Haitians one year after the earthquake struck Port-au-Prince, the capital of Haiti. The researcher traveled to Port-au-Prince and evaluated the prevalence of PTSD. The researcher conducted 85 interviews with varying demographic information, most important of which indicated whether the participant lived in a tent village or in a permanent structure. The interviews were conducted with the assistance of a professional Haitian interpreter. The Short Screening Scale for DSM-IV PTSD was implemented to assess the presence of chronic PTSD. The researcher did, however, make some changes to the demographic questions due to irrelevance, but the integrity of the scale remained intact. 53 of the 85 participants (62%) were found to be suffering from chronic PTSD. 83% of the people who scored positively (greater than or equal to 3) on the scale had been living in a tent village for one year. Compared to other available research, these findings are astronomical. The researcher found the availability and utilization of resources that aid in psychological recovery to be virtually nonexistent. This assessment of PTSD illuminates the necessity for psychological first aid after a disaster, especially in developing countries. The need for permanent places of residence for the displaced individuals after a disaster proved to be crucial to their psychological recovery as well.

## **UR.10 Self-Control and Violent Offending**

Jake Edwards

Advisor: Nicholas Bakken, Sociology and Archaeology

Violent crime evokes fear and awe from both the general and academic communities. Although age is understood to be significantly related to index crime perpetration, with little change from country to country or decade to decade, there is much debate as to why adolescents are prone to this sort of offending. This study is a secondary analysis of the National Youth Survey (Wave VII) testing Gottfredson and Hirschi's (1990) self-control theory of deviance. Indexes of social and self-control are established as independent variables, and their relationship to violent offending is analyzed.

## **UR.11 Desistance of Substance Use: Agents of Informal Social Control**

Molly Boss

Advisor: Nicholas Bakken, Sociology and Archaeology

This study will analyze what institutions of informal social control such as marriage, employment, and parenting, have the greatest impact upon one's desistance from substance use. A secondary quantitative data analysis from the National Youth Survey will be performed and examined using univariate, bivariate, and multivariate analysis such as linear or logistic regression. The results of this study will provide critical information that is necessary to promote the desistance of harmful drug use. Policy implications will be provided at a later date.

## **UR.12 Evaluating the Effectiveness of the BioSand Water Filter Program of San Juan del Sur, Nicaragua – A Critical Assessment of Aid**

Melissa Ruplinger

Advisor: Nabamita Dutta, Economics

Although officially classified by the World Bank as a lower-middle income developing country, more than two-thirds of the rural population of Nicaragua lives in poverty (World Bank, 2010). Despite fair access to potable water in urban areas, roughly 37% of the rural population of Nicaragua does not have access to improved drinking water sources (UNICEF, 2010). The coastal town of San Juan del Sur, Nicaragua adopted the use of BioSand water filters as a method to combat the widespread water crisis ubiquitous to the developing world. Funded through a Boston-based nonprofit, the BioSand filter project utilizes aid funds for the specific purpose of community development and water purification. Much of the dominant literature in the international aid debate has centered on the need for specific target projects in order for aid money to be best spent and directly benefit the people of a community (Easterly, 2006). Community involvement and understanding is also base to the success of any aid project, and with this comes the necessity for user satisfaction. This study investigates usage and upkeep of filters by BioSand water filter recipients in San Juan del Sur, Nicaragua. The study further determines whether these factors (usage, upkeep) have a significant impact on user satisfaction. Through data collected through surveying four rural communities surrounding San Juan del Sur, it was found that usage and upkeep of filters varied widely between communities. Overall, satisfaction with the program was generally quite high. The data collected is additionally used within a wider critical framework to assess the success of the BioSand filter project in San Juan del Sur, Nicaragua.

## **UR.13 Good Guy or Bad Guy: Examining Stephenie Meyer's Conception of Edward in Twilight**

Austin MacKenzie and Carissa Bennett

Advisor: Bryan Kopp, English

Almost anybody could intuitively know who is the hero and who is the villain in a book but how do authors think of these characters? Are they divided into beloved heroes and hated villains as they are for readers or are all the characters thought of simply as their own creations, all on equal footing? To begin examining this complex question Stephenie Meyer's descriptions of her character Edward were examined in two different sections of her book *Twilight*. These sections were chosen because Edward intuitively seems to shift from having an out-group to an in-group relationship with Bella, the protagonist of the story. Descriptions of Edward were coded using the Linguistic Category Model and analyzed to determine their level of abstraction. The positive and negative valence of these descriptions was determined through inter-rater agreement. A factorial ANOVA was performed using these data and the results analyzed based on the Linguistic Intergroup Bias, which states that positive descriptions of members of one's own in-group are more abstract while negative descriptions are more concrete and the reverse for out-group members. It was found that

significantly more negative words were used to describe Edward in the hypothesized out-group section as well as positive words in the hypothesized in-group section. However, abstraction level varied significantly with valence but not with in-group/out-group section,  $F(1, 44) = 10.076, p = .003$ . These results may indicate that while Stephenie Meyer introduced Edward to the reader as an out-group character before moving him into Bella's in-group, she always thought of Edward as an in-group character through the course of the book.

#### **UR.14 Analysis of Stylistic Attributes on Oneota Pottery from the Pammel Creek Site**

Jill Kotwasinski

Advisor: Connie Arzigian, Mississippi Valley Archaeology Center

Pottery is an important part of people's lives. Pots, more than any other kind of artifact, carry with them cultural background from the maker and their group. Although complete vessels are hard to find, broken pieces can provide vast amounts of information to archaeologists. This investigation focuses on Oneota shell tempered pottery. The Oneota extended over much of Iowa, into Missouri, Minnesota, much of Wisconsin, and western, as well as north-eastern Illinois. The La Crosse locality of Oneota lived in the area from A.D. 1200-1650. This investigation focuses specifically on the Pammel Creek site in La Crosse. In this investigation I will be analyzing sherds and whole pots trail markings and rim notchings. From the measurements of trail markings and rim notchings, together with their placement, will show that different vessels at different locations within the same site can be matched based on their tool/finger shape and size. This will also show that certain people were chosen to make the pottery, because they were superior at it, creating a division of labor. Also from this data I hope to gain knowledge of whether people were not only using old traditions when creating, but were trying new techniques as well.

#### **UR.15 The Representation of Algerian Women in the Works of Malika Mokeddem and Tahar Djaout**

Beth Schleicher

Advisor: Jennifer Howell, French, Modern Language

When looking at contemporary Algeria, fictional novels by native authors provide insight into the emotions and ideas of Islam. Malika Mokeddem and Tahar Djaout are examples of artists who represent characters in their works to depict "real" Algerians under everyday circumstances. The role of women in the country's postmodern society is one issue of interest and mentioned in works by both authors through character development and historical references. This paper analyzes particular novels from Mokeddem and Djaout to compare their portrayal of Algerian women. Both authors are Algerian-born who received collegiate education in France, willing to politically and socially raise awareness about controversial topics in their home country. Comparisons are made as to how the authors communicate the effects of colonialism and human rights struggles in Algeria. Mokeddem's novel *L'interdite* is correlated with *Le dernier été de la raison* and *Les Vigiles* by Djaout, focusing on character roles in regards to feminism and Algerian history.

#### **UR.16 Work-Life Conflict: Factors Associated with Negative Spillover from Home to Work**

Susan Schmidt

Advisor: Enilda Delgado, Sociology and Archaeology

The ability to successfully balance the role expectations of work and home life is an ongoing issue affecting working individuals. Work-life conflict can have adverse affects on both families and workplaces, impacting the wellbeing of society as a whole. One area of existing research on work-life conflict has focused on negative spillover from home to work. More specifically, when the stress from factors in individuals' home and family life extends into and adversely affects functioning in the workplace. The purpose of this study is to further examine the factors associated with negative home-to-work spillover through a quantitative study of secondary data. Using nationally representative data from the 2008 National Study of the Changing Workforce, this study analyzes home and family characteristics, occupational characteristics, and demographic characteristics of employed adults in the United States to identify which factors are most significantly predictive of negative home-to-work spillover. In identifying the strongest predictors, this study will add to the understanding of what may be done to alleviate the adverse consequences that affect both workplaces and families.

### **UR.17 Breaking the Silence: Selective Mutism and its Treatment in the High School Setting**

Katy Christensen

Advisor: Tony Docan-Morgan, Communication Studies

The purpose of this study is to investigate selective mutism in the high school setting. Selective mutism is a disorder used to describe individuals who cannot or will not talk in certain situations where speaking is either expected or necessary. Counselors are interviewed regarding their experiences with students with selective mutism, their knowledge about treatment of selective mutism, and what kind of language they use to describe students who do not speak. The results from this study address an important gap in the literature offering the unique perspective of counselors and explore the potential effects of the language used to describe the disorder. After completing this research, it is evident that selective mutism remains a rather unknown disorder among school and community counselors. Since treatment for selective mutism is complicated, this study also shows the value in considering several treatment methods.

### **UR.18 Health Behaviors and Campus Climate Based on College Student's Sexual and Gender Identity**

Brian Vanderheyden

Advisor: Keely Rees, Health Education and Health Promotion

Researchers find that Lesbian, Gay, Bisexual, Transgendered (LGBT) students have a more negative view of the campus climate as compared to their heterosexual identified peers (Brown, Clarke, Gortmaker, 2004; Hinrichs & Rosenberg, 2002; Rankin, 2006; Horn, 2006; Waldo, 1998). A negative perception of campus climate tends to negatively influence institutional commitment, academic development, and personal experiences (Rankin, 2006). The effects of heterosexist harassment, attitudes and beliefs impact LGBT students in multiple ways. Victimization of non heterosexual students can lead to significant mental health concerns such as suicide and depression (Zubernis & Snyder, 2007) as well as increased risky health behaviors (CDC, 2008). The purpose of this research was to determine the campus climates and health statuses of college students on a 2-year technical college versus a 4-year college in the same mid-Western community. Students completed an on-line survey that measured their perceptions of campus climate (inclusivity, campus environment, communication, etc), determine their overall health status and behaviors (nutrition, stress, exercise, sleep, sexuality, substance use, spirituality), and identified their attitudes about LGBT individuals. Research questions included: When assessing students' perceptions of campus climate is there a significant difference between students on a 2-year or 4-year college campus? If there is a significant negative campus climate at either institution does it predict a more negative health status for overall students or for the LGBT or non-LGBT students on a 2-year or 4-year college campus? University students (N=4,306) completed the survey at the beginning of the Fall 2010 semester (all students at both institutions received an invitation to complete the survey). The research instrument and protocol went through IRB at both campuses. Data was collected in October 2010 and analyzed March, 2011.

### **UR.19 Accuracy of PET versus SPECT for Myocardial Perfusion Imaging (MPI)**

Christopher Jacobs, Antonella Guardiola, Nancy McDonald and Stewart M. Spies

Advisor: Lisa Riehle, Nuclear Medicine at Northwestern Memorial Hospital

Although conventional SPECT has become the accepted technique for MPI, cardiac PET has begun to gain widespread utilization in the evaluation of coronary artery disease (CAD). The aim of this study is to evaluate the accuracy of PET vs SPECT for MPI when compared to cardiac catheterization (cath) results. The study consisted of 798 patients referred for MPI; 398 PET and 400 SPECT. PET MPI utilized a dipyridamole rest-stress imaging protocol with attenuation correction and Rb-82 using a dedicated PET system. SPECT MPI was conducted using a dual isotope rest-pharmacological stress imaging protocol. Studies were evaluated as normal, abnormal, or equivocal and location of defect was noted. Abnormal cath results were defined as  $\geq 50\%$  lesion of the left main and/or  $\geq 70\%$  lesion in the left anterior descending, left circumflex, or right coronary artery. Cath and previous image results were compared for matching lesions and defects, assessing accuracy of the respective imaging procedure. A total of 174 patients (79 PET, 95 SPECT) were referred for cath. Of them, 106 had CAD (51 PET, 55 SPECT). Perfusion imaging and cath results were correlated. The true positive rate for PET and SPECT MPI was 59.5% and 56.4% respectively while the false positive rate was 27.9% and 40.4%. The sensitivity of PET MPI was 90.4% while SPECT was 98.2%. Specificity of both tests was abnormally low. It was found that both PET and SPECT MPI are sensitive tests for diagnosing and evaluating the extent of CAD. PET is superior to SPECT because it offers increased image quality and speed, with less radiation exposure. The low specificity noted is likely due to referral bias (normal studies not referred for cath). Results may be limited due to other factors not considered. Further examination is warranted.



## **UR.20 A Phantom Study to Simulate Half-dose Imaging in Myocardial Perfusion SPECT**

Beth Lowenstein, Scott Leonard, Lisa Riehle and Stewart M. Spies  
Advisor: Lisa Riehle, Nuclear Medicine, Northwestern Memorial Hospital

3D-OSEM (3D) algorithms have been reported to preserve image quality in half-time myocardial perfusion imaging (MPI). Alternatively, this technique could be used to compensate for the reduced counts collected when imaging patients injected with half of the standard dose, thereby reducing radiation exposure. The objective of this phantom study is to simulate half-dose imaging utilizing the nature of the 6-hour half-life of Tc-99m. A dual head gamma camera was used to acquire SPECT scans of a phantom with a cardiac defect. A simulated 30mCi dose of sestamibi was used. The phantom was imaged at time 0 (T0) and again 6 hours later (T6). Projections were reconstructed using filtered back projection (FBP) and 3D. Corridor4DM (4DM) was used to quantify the cardiac defect, calculating the defect size (Ext), in percentage of the myocardium, and the severity (Sev), in standard deviations below a normal database threshold. General image quality was assessed visually. 4DM results showed an increase in Ext between T0 and T6 FBP reconstructions. 3D reconstructions at T0 and T6 demonstrate a small increase in Ext when compared to T0 FBP. Both FBP and 3D reconstructions showed a minimal increase in Sev from T0 to T6. Visually, the defect is well characterized across all reconstructions. T6 FBP images appear less uniform in normal cardiac regions and appear slightly distorted in the apical and basal lateral regions, contributing to the enlarged defect Ext. These regions appear more uniform in T6 3D images. The Ext values for FBP and 3D are at T0 (10.9%, 12.4%) and T6 (16.5%, 12.2%) respectively. The calculated Sev values for FBP and 3D are at T0 (3.9%, 4.1%) and T6 (4.1%, 4.3%) respectively. Although subtle, image degradation as visualized in T6 FBP images adversely affects quantitative analysis, exaggerating Ext when compared to T0 FBP. Although 3D reconstructions produce slightly larger Ext values, compared to T0 FBP, the values are more consistent between T0 and T6. Furthermore, 3D appears to preserve general image quality in the low-count T6 data.

## **UR.21 Integrating Indigenous Knowledge in Education in the Pirwa of Huancarani, Bolivia**

Leah Mortensen  
Advisors: Christine Hippert, Sociology and Archaeology and Peter Stovall, Educational Studies

This international research project examines the integration of indigenous educational methods in a local after-school program called the Pirwa in Huancarani, Bolivia. Using participant observation as my primary research method, this project shows how this rural, peasant, Quechua-speaking community is fighting to educate their children according to national standards while maintaining their culture. Bolivia, having recently undergone education reform, struggles to find the balance between advancing in a globalized economy and valuing indigenous culture. School curriculums throughout rural Bolivia often stifle indigenous communities with the dominance of Spanish-focused curricula standards. In Huancarani, the community formed a 20-member cooperative, complete with a children's after-school program that strives to provide children with indigenous Andean knowledge that is often neglected in national public schools. For example, the Pirwa's after-school program emphasizes the practice of ayni, which is the Andean practice of balanced reciprocity. This research is important because it shows that maintaining indigenous culture and being "modern" are not incongruous. Instead, people are blending traditional and modern philosophies and methods in order to make schools culturally relevant to specific populations.

## **UR.22 Patient Risk Associated With Nuclear Medicine Procedures: An Evaluation of Effective Dose**

Bradley Brunner and Michael Zimmer  
Advisor: Lisa Riehle, Nuclear Medicine at Northwestern Memorial Hospital

In today's society there is an increasing concern over the effects of medical radiation procedures and the subsequent carcinogenic risks associated with them. Currently, the most commonly used parameter for determining the radiation received by medical radiation procedure patients is effective dose. The purpose of this study is to evaluate effective dose as it relates to patient risk. Effective dose is the radiobiological detriment occurred upon the whole body. It utilizes weighing factors designed to reflect the different carcinogenic and hereditary radiosensitivities of each bodily tissue. Upon review of effective dose there are considerable scientific errors associated with its calculations. Specifically, effective dose includes hereditary risks (which are population-specific only and not patient-specific) and more notably, effective dose ignores age-dependent sensitivities associated with developing cancer. By utilizing the Biological Effects of Ionizing Radiation (BEIR) VII Phase 2 Report, one can directly calculate an age-dependent risk of cancer for specific radiation doses. When the BEIR model is employed to compare a dual isotope cardiac scan for a

young (25 yr old) patient and an old (65 yr old) patient, each receiving a 40.7 mSv (4070 mrem) effective dose, a three-fold increase in developing cancer at age 25 (0.409%) versus age 65 (0.136%) is observed, indicating the insufficiencies associated with using effective dose to assess patient risk. Typical results are observed for other nuclear medicine procedures. Although effective dose is successful in summing comparative radiation doses, there are deficiencies associated with its utilization to assess patient risk. These deficiencies consist of the inclusion of heredity effects and more importantly, due to the findings above, the exclusion of the age-dependent differences associated with developing cancer.

### **UR.23 A Century of UW-L Women and The Racquet: 1910-2010**

Brianna Marshall

Advisors: Teri Talpe, Murphy Library and Sara Sullivan, Psychology

The purpose of my research is to take an in-depth look at the portrayal of women within The Racquet, the University of Wisconsin-La Crosse student newspaper. I have examined the changing roles and realities of UW-L women by researching editorial content published in The Racquet over the past 100 years. The Racquet was founded in 1910, and doing a decade-by-decade comparison of women as viewed through the lens of the student paper reveals true insight into the female UW-L student from then until now. This student paper reflects the way that many historically significant national developments (for example, the Women's Liberation Movement in the 1970s) manifested themselves on the UW-L campus. I have also incorporated a student survey that provides data on current student perception of The Racquet's relevancy, quality, and representation of student life. This survey is a way of concluding the historical content of my research and provides a foundation on which future scholars of The Racquet and UW-L history can build upon.

### **UR.24 Neighbors of the Future Patagonia National Park: Community Inventory and Recommendations for Outreach**

Elena Bantle

Advisor: Jo Arney, Political Science and Public Administration

Around the world, conservation initiatives by outsiders are taking hold. In Southern Chile and Argentina, nonprofit organization Conservacion Patagonica's mission is to do just that: to create large-scale conservation projects that, upon completion, are handed over to the national government. By continuing studies at their current flagship project, the future Patagonia National Park, I seek to deepen understanding of this particular case. Because it is such a remote area experiencing significant recent development efforts (in addition to the park, a major hydroelectric dam project is proposed), surveys sought to pinpoint whether resident-identified development issues varied from (or were reflective of) those identified by the foreign project directors. The resulting inventory offers insight into community-wide values and an opportunity to more strategically frame community support efforts. Recommendations of community outreach approaches (for the future park) are included.

### **UR.25 Burial Treatment of Women in Sanisera: Understanding the Cultural Identity of Women in 5th to 7th Century Menorca, Spain**

Eliana De La Rosa Pichardo

Advisor: Joseph Tiffany, Sociology and Archaeology

In 5th to 7th Century Spain, the lives of women in the former Roman city of Sanisera were influenced by indigenous, Roman and Christian cultures. These cultures shaped the way women lived, how they were treated, and how women identified themselves. By looking at the context of the tombs found in the Sanisera site, the lack of articulated skeletal remains posed challenges to the mortuary study. There is little historical information on post-Roman societies due to lack of literary evidence as well as few archaeological and historical focus on the post-Roman world. The skeletal remains are limited and when found; the remains are fractured, dis-articulated and/or in poor condition due to the soil composition that did not allow proper skeletal preservation. Also, the site has been looted in the past and the tombs have been re-used for re-burial which disturbed the stratigraphic layers in the tombs. Surprisingly, the archaeological data itself provided a new way of looking into the context of the burial remains. Archaeological case studies of Roman Spain are explored and added as supplements to provide information and comparison to the burials in Sanisera. The main focus of this research is the comparative analysis on the archaeological traits of Roman, indigenous, and Christian cultures, by comparing them with the archaeological remains found at the Sanisera site and throughout the Iberian region. It is anticipated that the primary culture from the burials were of Roman origin due to the Sanisera site itself was

once a Roman city before its abandonment. The archaeological data are summarized as a supplement and to reflect the cultures associated in context with the burials.

#### **UR.26 Cognitive Poetics And Metaphor: Broad Reaching Applications As Seen In Three Examples From Shakespeare, Charles Dickens And James Joyce**

Andrew Depies

Advisor: Lolita Pandit Hogan, English

Cognitive Poetics is not simply about reading literature but rather how literature simulates the cognitive processes of the mind. In a literary 'reading' or text the figurative language uses natural and man-made objects in a systematic way so that one can conceive of a science of aesthetics, rather than a random set of images that are, by those who do not study literature, seen to have nothing but a decorative purpose. The term, "cognitive" foregrounds the mental action involved in reading and "poetics" deals with the craft of literature. Literature in its cognitive aspect has a world making function based on experiential knowledge derived from how emotions are elicited, and how various cognitive processes of the mind work to produce literature as well as lead to enjoyment when we read it. As literature is part of the natural everyday world, so is metaphor. Therefore, metaphorical language and introspection surface from life experience. Metaphor plays a role in human thought, understanding, and reasoning and, beyond that, in the creation of our social, cultural, and psychological reality" (Kovecses, X). Hence, both cognitive poetics and metaphor can be understood in how the world in which we live is both different from, and a part of the world contextualized in literature.

#### **UR.27 A Portrait of Dental Care in Modern Ecuador**

Christopher Herbst

Advisor: Gary Gilmore, Health Education and Health Promotion

Ecuador is a country that has enjoyed little political stability over the years. As a result of this, it is difficult for the rest of the world to stay abreast of current policy affecting healthcare. Dental care, in particular, is a topic that few foreigners are familiar with. This can lead to difficulties for those who wish to plan their travels to the country ahead of time. To get a better sense of the current dental care system, interviews and product comparisons were conducted in a variety of localities. It was found that public dental care has taken a very progressive turn in Ecuador. President Rafael Correa declared that basic healthcare would be made available, free of charge, to all citizens who required it. While the citizens of larger metropolitan areas have begun to realize the benefits of this policy, care is often either unavailable or not provided gratis the farther one travels away from large cities. This is most likely because there is not enough funding to sustain the policy. It is not uncommon for inhabitants of rural Ecuador to spend a day traveling to a city with a full-service clinic and waiting to be treated in the dental clinic. More clinics, however, are being built or upgraded in rural areas. Diversity of dental hygiene products was very limited in all of the areas, and dental floss was only found in the largest city. This may be due to a cultural undervaluation of dental hygiene, or a shelfspace limitation inherent in the small, family-owned stores that provide daily essentials for most of the country.

#### **UR.28 Origins of North American populations of the invasive faucet snail, *Bithynia tentaculata***

Levi Hartman

Advisor: Kathryn Perez, Biology

Since the introduction of the faucet snail, *Bithynia tentaculata*, into the Upper Mississippi River (UMR) in 2002, there have been yearly die-offs of 15 species of waterfowl. *B. tentaculata* completes the life cycle of several invasive parasitic trematodes, including *Cyathocotyle bushiensis* and *Sphaeridiotrema globulus*, causing the waterfowl deaths. The objectives of this project are to determine the origin and spread of invasive *B. tentaculata* populations in the U.S. which will be used to implement better methods of prevention and monitoring of colonization routes. Since 16s mtDNA and COX-1 sequences show little to no variation between U.S. *B. tentaculata* populations, microsatellite analysis is used to more accurately show variation. Seventeen microsatellite loci (tandem base repeats) from *B. tentaculata* were characterized, which provide more relevant data than mitochondrial DNA sequences due to the high polymorphism rate associated with the non-coding microsatellite regions. DNA was extracted from raw tissue by a CTAB/phenol chloroform digest. The extracted DNA was amplified in a 6-FAM labeled, fluorescent primer microsatellite PCR. The microsatellite PCR product was then analyzed with fluorescence fragment analysis with a maximum expected band of 404 bp. Alleles were present in Hungarian samples that were not present in U.S. samples, and vice versa. The Hungarian Danube River basin, currently our only European samples, is likely not the origin of the U.S. populations of *B. tentaculata*. Further sampling of the native distribution will be done to further narrow down the location(s) of origin for U.S. populations of *B. tentaculata*.

**U.29 A Cross Cultural Comparison between the United States and Ireland: Exploration of Factors Influencing Body Image among Adolescent Girls**

Lindsey Purl and Cortney Draxler  
Keely Rees, Health Education and Health Promotion

Low self-esteem and disordered eating are prevalent issues among adolescent girls in the United States. Negative body image and low self-esteem play a major role in the development of an eating disorder. Therefore, it is important to investigate what is causing body image disturbances among adolescent girls in the first place. One aspect that is addressed frequently is media. Adolescent girls living in a western culture are frequently exposed to aggressive media images of beauty determined by size and outer appearance. With body dissatisfaction affecting children at a younger age, the role of a strong and an effective health curriculum to encourage health behaviors earlier in life becomes increasingly important. School district/system have the ability, through education, to influence their adolescent girls to maintain a healthy lifestyle and body image despite the strong negative influences of the media. This study looks at two western countries Ireland and the United States, specifically Galway, Ireland, La Crosse, WI, and La Crescent, MN. Data was collected by facilitating focus groups, distributing questionnaires, and conducting interviews in both countries to discover specifically how education affects their body image and development of healthy behaviors. This information will contribute to a better understanding of what needs to be addressed within school health education to help adolescent girls with developing a healthy body image.

**UR.30 How Jimmy Aced His Exam: Theoretical Explanations for Non-Medical Prescription Drug Use on College Campuses**

Sarah Malone  
Advisor: Nicholas Bakken, Sociology and Archaeology

The purpose of the current study is to find theoretical explanations for human substance use, specifically focusing on non-medical prescription drug use by college students. Little empirical research has considered when most college students begin misusing prescription drugs. Both Self Control Theory by Gottfredson and Hirschi (1990) and Social Control Theory by Hirschi (1969) can be applied to explain why underclassmen college students may have a higher rate of non-medical prescription drug use than upperclassmen college students. Univariate, bivariate, and multivariate (regression) models of the independent and dependent variables will be presented. Upon completion, the final results will contain theoretical explanations for non-medical prescription drug use on college campuses and will contribute to existing research by studying exactly when in a college career most students begin misusing prescription drugs and why. This new addition to previous research will offer policy makers and campus coordinators new outlooks on how to target the correct time frame of a student's college career. Through new applications and analyses, this research will open new doors to understanding the phenomenon of drug misuse and lead to further research on prescription drug use by college students.

## UNDERGRADUATE EXHIBIT PRESENTATION ABSTRACTS

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

### E.1 Subtractive Intaglio in Italy: An Atelier's Experience

Kirk Benson and Nathaniel Shields  
Advisor: Joel Elgin, Art

After studying for numerous semesters in the printmaking studio, within the art department at the University of Wisconsin-Lacrosse, the two of us have learned a great deal about the complicated processes that practice of printmaking involves. Our study and work has been specifically focused on the technique known as intaglio. Intaglio is a process that focuses on the manipulation of a metal plate in order to create an image. The plate is inked and ran through a press in order to transfer the image to paper, creating the end product, the print. The repetitious nature of the printmaking process offers the interesting opportunity to produce multiple identical copies of a given work and reach a much broader audience than other mediums of art production. With years of experience we have both had the opportunity to experiment and learn different mark-making techniques, broadening the type of work we can produce. However, with time constraints and some facility limitations there are some processes that we are unable to pursue in the UWL printmaking studio. In June 2010, along with a group of 10 other UWL printmakers, we traveled to Italy to learn a subtractive technique of Intaglio printmaking under direction of master printmaker Swietlan Kraczyna. During the three-day intensive workshop we worked together in Kraczyna's print shop where we were taught a process the Kraczyna revolutionized. The process is a multiple plate color process based on the idea of creating any color image by means of mixing the three primary colors. During the workshop we worked in a subtractive on three plates (one dedicated to yellow, red and blue) to create a final image. Upon returning to UWL we have used the experience to better ourselves as technical artists and share our artwork with our peers and the La Crosse community.

### E.2 Investigating Color Intaglio Printmaking in Barga, Italy

Heather Johnson, Sarah Higley and Keriann Noga  
Advisor: Joel Elgin, Art

While in Italy Keriann Sarah and I learned much about art, the creative process and creating an effective atelier between artists. We were exposed to many famous art pieces. We learned a great deal about Intaglio and the use of multiple plates to create 100 colors using only 3 ink colors as well as using aquatint and different levels of transparency in inks to achieve a perfect black. We learned many techniques that simplify and speed up the process of this form of Printmaking. We also dove head first into using subtractive methods on each plate to create our image. Our drawing workshop took us to many interesting and historical sites and developed my observational skills through gesture drawing. I have shared my knowledge and experience gained from this adventure with the art students at Cashton Area Schools.

## UNDERGRADUATE EXHIBIT PRESENTATION ABSTRACTS

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Valhalla Hall:  
11 am-12:45pm

### E.3 Glass Blown Photography

Bethany LaDue  
Advisor: Jennifer Terpstra, Art

Glass blown photography is an artistic piece created by first blowing a piece of glass, and later applying photographic emulsion to print on the surface of the glass. Use of photographic emulsion in this way is very complicated and requires very specific conditions to be successful. Through combining the mobile qualities of the glass through its creation with photography that focuses primarily on dancers, the idea of motion can be presented on both a two-dimensional and three-dimensional plane. Through working with these media, I have further been able to understand the qualities of

both glass and photography and create many flat glass works with photography developed on them. In realizing the complexities of photographic emulsion I will continue to work on this process to eventually be able to develop onto pieces with higher relief. Through working up to pieces with high relief, I will continue to explore the intricacies of distortion and how that affects the image that is developed onto the glass. I fully intend on continuing work with both of these medias separately as well as in mixed media projects, so that I can further learn of their separate qualities and find the best ways to combine them into successful artistic pieces.

#### **E.4 Interpreting the Figure Through Clay**

Timothy Znidarsich

Advisor: Karen Terpstra, Art/Ceramic/Handbuilding

The Anderson Ranch located in Cape Hope, Jamaica is a world renowned studio that offers workshops in a variety of art mediums. My interests as an art student and future art teacher vary, but my main passion is ceramics. A summer workshop entitled, *Interpreting the Figure*, focuses and emphasizes expression and alternative representation of the human form. This workshop is to be held from July 25th 2011- August 5th 2011. Through this experience I will explore alternative ways in interpreting the human form, rather than an anatomically correct figure. This workshop will help me develop my technical skill, introduce me to varied depictions of the human form, and most importantly those of other cultures. This workshop is run by Cristina Cordova, a renowned ceramist with a MFA from Alfred University. As a future art teacher this experience will provide me with valuable and indispensable knowledge of ceramics, alternative perspectives, and views of a different culture. Being able to implement ideas and theories from this workshop will be priceless for my future students, my peers at UWL, the community, as well as myself. During this intensive program I plan on creating many drawings, sketches, and taking detailed notes about the figure and how to exemplify emotion and personality through such representations. I will fully utilize the 24 hour studio to produce a variety of work. I will use this research to produce an immense amount, I estimate fifteen sculptural works, expressing a multitude of feelings and emotions. After this experience I want to conduct a workshop at UWL demonstrating and passing on my gained knowledge to community members, teachers, and fellow students. I also want to produce a series of works exemplifying this new knowledge, and to have a show at a local gallery, such as the Grand River Station.

#### **E.5 Exploring the Additive Process of Intaglio Printmaking**

Joanne Clark and Ali Wesner

Advisor: Joel Elgin, Art

Our intentions as students in an ever-changing and creative field were to travel to Italy, a hub of the arts for centuries past and future to learn. We learned new printmaking techniques, skills, as well as perfected old methods. We flew to Italy where UWL Alumni Eric Hansen escorted us to a workshop founded by Swietlan N. Kracyna who specializes in the additive multi-plate color intaglio printmaking process. At the workshop we committed ourselves to an intensive three day learning process. Before and after the workshop, we explored the country to absorb the Italian culture as both an experience in art as well as an experience in life. We recorded what we have learned through creating our own color intaglio prints in the following semesters after we returned as well as teaching these methods to our fellow classmates. We also documented the whole workshop experience with the creation of a printmaking manual that will be displayed in an online format that utilizes images taken during the printmaking workshop. The manual will be linked to our UWL Printfever blog, and can be viewed by students to help them learn the process even after we have graduated from the University. We have also exhibited our work in a show at the Black River Beach Gallery in La Crosse, Wisconsin. The show runs through the last week of March.

# **GRADUATE STUDENT ABSTRACTS**

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# GRADUATE POSTER PRESENTATION ABSTRACTS

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

## **G.1 Validity and Reliability of Two Commercially Available Running Computers with Foot Pods Used to Assess Running Speed**

David Hovsepian

Advisors: Stacey Meardon and Thomas Kernozek, Health Professions

Of the commercially available methods used to measure the speed of a runner, running computers, consisting of a wrist worn watch and foot pod accelerometer, are highly portable devices that lend themselves to monitoring speed in various field conditions. We set out to investigate the reliability and validity of two such running computers on a 200m indoor track. Subjects were asked to run 5 laps at a self-selected steady pace while wearing the two running computers. Two infrared sensors (timing lights) placed 6 meters apart were used to calculate the criterion speed for the short distances under both straightaway and curve conditions. Lap times were recorded and used to calculate the criterion speed for each lap. Values generated by the running computers were compared to the criterion speed for the straight, curved, and lap conditions. Intraclass correlation (ICC) was used to assess reliability of the three devices. Validity was assessed using a combination of Pearson's R correlation coefficients and repeated measures ANOVA. Correlations between timing light data and Device 1 were moderately strong with the 6m straight ( $r=0.69$ ) and curved ( $r=0.85$ ) speeds and strongly correlated with lap speeds ( $r=0.92$ ). Strong correlations with speed calculated from the timing lights existed with Device 2 in all three conditions (straight:  $r=0.97$ ; curved:  $r=0.97$ ; lap:  $0.99$ ). A difference was found in reported speed between Device 1 and the timing light data in the straight ( $p=0.01$ ) and curved conditions ( $p=0.05$ ). No differences were found between either device and timing light data for lap speed ( $p>0.05$ ) and Device 2 did not differ in speed from the timing lights under straight or curved conditions ( $p>0.05$ ). Therefore, Device 1 was not as reliable or valid over short distances as Device 2; however, both devices performed well over 200m.

## **G.2 Reliability of the Rubor of Dependency Test**

Lisa Lallensack and Lori Brunner

Advisor: John Greany, Health Professions

Rubor of dependency is a noninvasive test for peripheral arterial disease (PAD); it is performed by examining the foot's plantar surface, elevating for one minute and observing time for color return. The purpose of this study was to investigate the inter-rater reliability of the rubor of dependency test. Methods: Two Doctor of Physical Therapy students were selected as testers. Fifty volunteers over age 49 ( $68.7 \text{ yrs} \pm 9.9$ ) with and without known cardiovascular disease were recruited. Each subject was positioned supine for one minute prior to data collection and color of the right foot was observed. The right leg was elevated and supported between 45° and 60° of hip flexion for one minute. The subject's leg was lowered back to the surface and the forefoot was observed. The time it took for color return was measured in seconds (positive test  $> 25$  seconds). This procedure was repeated with the left foot and then by the second examiner. Correlations were reported as intraclass correlation coefficients (ICC<sub>3,1</sub>), Pearson correlation and split-half correlation. Inter-rater reliability analysis using the Kappa statistic was performed to determine consistency between raters. Results: Analysis revealed poor reliability between testers (ICC<sub>3,1</sub> = 0.35,  $r = 0.38$ ). In an attempt to identify tester learning, split-half reliability revealed greater association with the last half of subjects ( $n=25$ ; ICC<sub>3,1</sub> = 0.47) compared to the first half (ICC<sub>3,1</sub> = 0.32). Inter-rater reliability for raters was found to be Kappa = 0.37 ( $p < 0.001$ ) for positive tests. Conclusions: The results suggest poor reliability of the rubor of dependency test between two novice raters as indicated by low ICC values. Reliability improves with experience using the test, however these values are not clinically acceptable. This test should be evaluated for validity prior to making conclusive statements on use as a screening for PAD.

## **G.3 The Benefits of Martial Arts in Children with Autism Spectrum Disorder**

Kimberly Check and Katelyn Manske

Advisor: John Greany, Health Professions

Introduction: The goal of this pilot study was to evaluate the effect of martial arts on physiological, social and cognitive domains in a group of children with Autism Spectrum Disorder (ASD). Methods: Six children (4-10 years) with ASD attended 45-minute martial arts sessions taught by an experienced instructor 2x/week for 11 weeks. Children were



assessed pre/post for single leg stance time and postural sway. Parents completed the following behavioral surveys prior to and at the conclusion of the intervention: Autism Treatment Evaluation Checklist (ATEC), Social Skills Rating System-Parent Form (SSRS-PF), and Clinical Global Impression (CGI). Data were analyzed using paired t-tests. Results: Single leg stance time improved on both the right (9.0 +/- 4.6 to 19.5 +/- 12.1 sec, p = 0.04) and left (7.5 +/- 5.1 to 13.4 +/- 6.5 sec, p = 0.005). Postural sway showed no statistically significant differences for any of the three conditions. The SSRS-PF showed improvements in the Assertion (initiating behaviors, and responding to the actions of others positively) subscale score (9.5 +/- 4.7 to 14.2 +/- 2.7; p = 0.03) as well as the overall Standard Score for Sociability (72.0 +/- 16.9 to 90.3 +/- 12.0, p = 0.049). The Sociability subtest score of the ATEC showed a 49% improvement (13.2 +/- 3.9 to 6.0 +/- 2.8, p = 0.015) for subjects (n = 5). 67% of parents reported moderate improvement overall on the Global Improvement Scale as well as social interaction, play skills, and gross motor skills. Conclusion: The results of this pilot study suggest martial arts may improve single limb balance in children with autism spectrum disorder. Martial arts may also help with certain stereotypical characteristics of ASD, such as assertion and social skills. Further studies with more subjects should be done to confirm these preliminary findings.

#### **G.4 The Fitness Benefits of Pushing a Double Baby Stroller Outdoors**

Angela Holan and Britni Schickert  
Advisor: John Greany, Health Professions

Introduction: New mothers have limited opportunities to begin or restart a fitness program. Pushing a baby stroller is a common choice for mothers with more than one child. The aim of this study was to compare cardiorespiratory responses and energy expenditure of various walking speeds while pushing a double baby stroller. Methods: Seventeen female volunteers (23 ± 0.9 yrs) completed a treadmill VO<sub>2</sub> peak test to determine aerobic capacity. A portable gas analyzer was used to measure oxygen consumption while subjects performed 3 exercise sessions in random order pushing a front-to-back double baby stroller (3.0 mph, 4.0 mph, and a self-selected speed). The stroller included an additional 50 pounds to simulate the weight of 2 small children and a diaper bag. Oxygen consumption (VO<sub>2</sub>), heart rate (HR), and walking speed were measured. Steady state data were analyzed by repeated measures ANOVA for each factor and pairwise comparisons were performed. Results: At steady state there was a difference (p<0.001) between relative VO<sub>2</sub> (ml.kg<sup>-1</sup>.min<sup>-1</sup>) for walk speed. Post hoc comparisons revealed differences between all trials; 3.0 mph (18.6 ± 2.6 ml.kg<sup>-1</sup>.min<sup>-1</sup>, 44% VO<sub>2</sub> peak), 4.0 mph (24.5 ± 2.5 ml.kg<sup>-1</sup>.min<sup>-1</sup>, 58% VO<sub>2</sub> peak) and self-selected speed (26.4 ± 4.5 ml.kg<sup>-1</sup>.min<sup>-1</sup>, 62% VO<sub>2</sub> peak). Total caloric expenditure was found to be different between all trials, 3.0 mph (5.2 ± 0.5 kcal/min), 4.0 mph (6.9 ± 0.5 kcal/min), and self-selected speed (7.5 ± 1.1 kcal/min). Total energy expenditure for a 30-minute session while pushing a double baby stroller would be 156 to 225 kcals. Pushing a double baby stroller while walking at least 3.0 mph was sufficient to meet the threshold for improving cardiorespiratory fitness. Conclusion: These data suggest that walking at least 3.0 mph while pushing a double baby stroller can be an effective way to obtain health and fitness benefits.

#### **G.5 In Vitro Regulation of the seq and sek Staphylococcal Enterotoxin Genes Among Four Allelic Variants**

Lindsay Sammons and Sanjay Shukla  
Advisor: William Schwan, Microbiology

Community-associated methicillin-resistant *Staphylococcus aureus* (CA-MRSA) is considered to be more virulent than hospital-associated MRSA, presumably because it possesses additional, unidentified virulence factors. Two virulence proteins epidemiologically important to CA-MRSA are staphylococcal enterotoxins Seq and Sek. Four allelic variants of the seq/sek locus exist with type 4 being exclusive to the USA300 CA-MRSA strain type. In vitro expression analysis of seq and sek among all four allele types was performed. Co-transcription of the enterotoxins was revealed for all allele types. Quantitative analysis showed very low overall expression of seq and sek during growth. The lowest expression occurred during the stationary phase for all allele types, while various strain- and allele-specific levels of absolute expression existed. When comparing all four allele types, the lowest seq and sek expression occurred in allele type 3, while the highest expression of seq occurred in allele type 4, suggesting a potential role in the virulence of the USA300 strain type.

## **G.6 Screening for Fall Risk in Community Dwelling Elderly**

Matt Thom and Beth Dobbins  
Advisor: John Greany, Health Professions

The purpose of this study was to compare fall risk screening instruments: Timed Up and Go test (TUG), Walking Trail B Test (W\_TrB), and age for the strongest psychometric properties for identifying elderly with an injurious fall in the previous year. Methods: 99 community dwelling elderly subjects (mean age 79.5; range 65-96, F=83; M=16) were recruited from La Crosse county. Demographic information and fall history were obtained prior to testing. Subjects completed TUG test, a timed test of mobility and balance (involves standing from a seated position, walking 3 meters and returning to a seated position). The W\_Tr B test is a test that assesses mobility and cognition. This test requires a subject to complete the same task as the TUG, while simultaneously challenging cognition (placing feet on alternating alpha numeric marks on the floor). Results: There were 48 subjects with a fall history (mean age 81.6 +/- 8.5) and 51 non fallers (mean age 77.6 +/- 8.5). 13 subjects fell and sustained a serious injury that required medical attention. Univariate logistic regression models for identifying an injurious fall history showed that the W\_TrB model had the highest predicted accuracy of 75% (sensitivity = 54%; specificity = 78%; R2 of 9.9). The TUG model had similar results with 71% of the participants accurately identified (sensitivity = 62%; specificity = 72%; R2 of 6.1). The model with age alone had an accuracy rate of 64% for identifying injurious fall history. Conclusion: In this sample the W\_TrB logistic model showed minimally acceptable predicted validity for 12 month retrospective injurious fall. However, the low sensitivity of 54% is a concern since a significant number of injurious fallers (46%) were not identified with this instrument. Further research should be conducted to evaluate the psychometric prospective 12 month injurious fall rates.

## **G.7 Gender Differences in Muscle Forces at Knee Joint in Young Adults During Drop Landings**

Tricia Mans, Liane Corwith, Sara Frederickson and Jocelyn Frey  
Advisor: Di An Hong, Health Professions

Quadriceps and hamstrings play a critical role in the amount of stress placed on the anterior cruciate ligament (ACL) during deceleration activities. Purpose: To determine the gender differences in individual muscle forces and quadriceps to hamstrings force ratio (Q:H) among young adults during drop landings. Methods: Thirty-six subjects (18 females, 18 males) performed drop landings at two different heights (40 cm, 60 cm). Data was collected using a 3D motion analysis system and force platforms. OpenSim software was used to estimate individual muscles forces (normalized to body weight) at the knee. The Q:H was determined by dividing the sum of the peak quadricep forces (rectus femoris, vastus lateralis, vastus intermedius and vastus medialis) by the sum of the peak hamstring forces (semitendinosus, semimembranosus, biceps femoris long and short heads). At each height, independent t-tests were run to analyze peak muscle forces and Q:H between genders. Results: The mean hamstring peak force was greater in females at both heights ( $p = .001$ ). At the height of 40 cm, the mean Q:H for females was  $1.44 \pm 0.28$  and males was  $1.86 \pm 0.59$  ( $p = .011$ ). At the height of 60 cm, the mean Q:H for females was  $1.44 \pm 0.28$  and males was  $1.88 \pm 0.42$  ( $p = .001$ ). Discussion: Compared to males, females had a greater hamstring force. As a result, females had a smaller Q:H at both heights, indicating more co-contraction. This contradicts previous findings using electromyographic (EMG) and inverse dynamics that have found females to have less co-contraction, leading to ACL tears. However, these results represent preliminary research using a forward dynamic approach and further studies are needed for validation.

## **G.8 Effect of Running Experience on Pacing Strategy**

Samantha Bischel  
Advisor: Carl Foster, Exercise and Sport Science

Objectives: To learn how people develop a pacing template during running and test whether there is less variability in their pacing strategies as they become more familiar with the trial runs. Methods: 12 untrained subjects (3f, 9m) completed six 3k running trails. Subjects completed the trials in their fastest times possible, with incentives being offered to improve time. RPE was measured every 200 meters and velocity every 100m. Blood lactate measured pre and post trial. HR were recorded during each trial. Results: Time improved from trial to trail. Mean starting velocity increased from trail to trail but mean finish velocity was the same. With each trial mean total time also improved with each trial until it began to plateau slightly. Conclusions: The slower starting velocities in the first initial trials agree with the anticipatory regulation of exercise response. The subjects started out slower and as the trial neared the end they were able to speed up because they felt as though they would not harm themselves. As the starting velocities got faster,

ending velocities remained very close to the same. We had hypothesized that with experience the subjects would develop a more even pacing pattern. However, variability in velocity did not decrease across trails.

### **G.9 The Effect of Music on Time Trial Performance**

Jana Hagen

Advisor: Carl Foster, Exercise and Sport Science

Purpose: Exercise, particularly higher intensity or competitive exercise, depends on the interaction of a template or plan. This plan determines how to go about the exercise and feedback from the body determines how the exercise bout is affecting the body. In well-trained people the interaction between template and feedback is very sophisticated, and allows exercise performance to be optimized. The 'language', which the brain apparently speaks in terms of this template and feedback, can be understood in terms of Rating of Perceived Exertion (RPE). Motivational music has been shown to, generally, be an augmentor of exercise performance. The purpose of this study is to determine if motivation music, used as a strategy to manipulate the template-feedback system, during a cycle time trial, will change performance. Methods: (N=18) mean age= 27.6+8.7 well-trained cyclists performed two randomly assigned 10km cycle time trials, either listening to self-selected motivational music or control trial. A variety of performance markers (power output, HR, blood lactate, RPE) were monitored. Results: Self-selected motivation music had no affect on HR 174.1+11.3 and 171.8+10.4, power output 222+66 and 220+65, RPE 8.4+1.5 and 8.5+1.6, blood lactate 8.2+3.6 and 8.2+3.5 or time 17.75+2.1 and 17.81+2.06 (p>.05). Conclusion: The results show no significant difference in time trial responses relative to the presence of music.

### **G.10 A Communication Toolkit: Communicating the Healthy Choice to Our Communities**

Amanda L. Nogle

Advisor: Gary Gilmore, Health Education and Health Promotion

A Communication Toolkit: Communicating the Healthy Choice to Our Communities is a graduate project in partnership with the La Crosse Medical Health Science Consortium's Healthiest County 2015: La Crosse project. Over 30 area organizations are partners in the Healthiest County 2015: La Crosse project and are working together to help make the healthy choice the easy choice in La Crosse County. The goal is to positively influence health behaviors to increase La Crosse County's health ranking to number one in Wisconsin by 2015; rankings are according to the UW Population Health Institute and the Robert Wood Johnson County Health Rankings. The goal of the Communication Toolkit project is to provide information to the partners to help them create strategic communication plans, align communication efforts across the partners with a tagline ('making the healthy choice together') and promote innovative thinking about communication and its influence on health behaviors. The Communication Toolkit will be used during the 3rd annual Health Summit when the project partners come together to discuss the Healthiest County 2015 project. Facilitators will guide the partners, who will be divided into four health focus areas, through a step-by-step process to create strategic communication plans for each of the focus areas. By effectively aligning Healthiest County 2015: La Crosse communication efforts across community partners, a more consistent and effective message can be sent to the general public about the project. Creating greater awareness in the general public with effective communication will contribute to health behavior change and therefore increase the likelihood of achieving the goal of becoming the healthiest county in Wisconsin by 2015.

### **G.11 Running injury and postural control**

Megan Kramp, Tiffany Switlick, Jessica Bollinger and Jennifer D'Orazio

Advisor: Stacey Meardo, Health Professions

Running is a popular form of exercise. Unfortunately, lower extremity injury incidence rates range from 20-80%. Decreased postural control has been associated with injury risk in many sports, but has not been studied in running. The purpose of this study was to determine if a difference in postural control exists between injured and non-injured runners. Injury was defined as a self-reported running related overuse injury that interrupted training for greater than seven days. Nine injured and 16 healthy runners participated in this study. Participants performed three 30-s trials of two conditions on a force platform, eyes open (EO) and eyes closed (EC) single limb stance (SLS). Postural control measures consisted of mean anteroposterior (AP) and mediolateral (ML) center of pressure (COP) excursion and standard deviation (SD), average velocity of COP, and 95% confidence ellipse area. Independent t-tests and effect size (ES) calculations were used to analyze data ( $\alpha=0.05$ ). Preliminary results revealed no significant difference in the postural control measures between injured and non-injured runners. However, a trend for increased AP excursion ( $p=.07$ ,

ES=.86) and SD ( $p=.08$ , ES= .81) in injured runners was found during EO SLS. In the EC condition, ML excursion ( $p=.07$ , ES=1.07), average velocity of COP ( $p=.09$ , ES=.79), and 95% confidence ellipse area ( $p=.12$ , ES=.79) were greater in the injured group. Our results provide emerging evidence that injured runners may have altered postural control. Therefore, postural control should be considered in the rehabilitation of running injury. The small sample size may have negatively influenced our results. However, consistent with other studies in high functioning populations, the traditional measures of postural control used in this study may not be sensitive to group differences. Further analysis will be conducted using time to boundary measures, measures shown to differentiate between injured and non-injured athletes.

### **G.12 Comparison Of Male and Female Gluteal Muscle Activity and Lower Extremity Kinematics During Running**

Michael Erickson, Carrie Broz, Chelsea Craig and Isaac Petrowitz  
Advisor: John Willson, Health Professions

Female runners historically are more prone to lower extremity overuse injuries, such as patellofemoral pain syndrome, iliotibial band friction syndrome, and tibial stress fractures when compared to their male counterparts. This may be a result of altered hip and knee joint mechanics and gluteal muscle activity during running. Forty healthy college students (20 males, 20 females) of similar age and running experience participated in the study. Subjects performed five running trials on a 25-meter runway as the right lower extremity 3-dimensional hip and knee joint motion and gluteal muscle activity were recorded. The gluteal muscle activity was normalized to a maximal contraction. Gluteus medius and maximus strength were measured during prone hip extension and side-lying hip abduction. Dependent variables analyzed include right hip and knee frontal and transverse plane motion, frontal plane moments, and gluteus medius and maximus muscle activity. Our results show no differences were found for right hip and knee frontal and transverse plane motion or frontal plane moments between males and females ( $p > 0.05$ ). Female runners were found to have 28% greater gluteus maximus activation ( $p=0.023$ ) and 33% less hip extension and hip abduction muscle strength ( $p < 0.006$ ) compared to males. These data indicate that females recruit gluteus maximus to a greater extent during running than males despite their similar running kinematics. This may suggest that the increased gluteus maximus muscle activation of females may cause them to fatigue faster during prolonged running. This could lead to less force generation by the muscle, altered kinematics, and increased risk of lower extremity overuse injuries.

### **G.13 The Relationship of Performance and Training on the Power Tower Apparatus of NCAA Division III Competitive Swimmers**

Nicholas Kuffel and Danielle DeSerano  
Advisor: Glenn Wright, Exercise and Sport Science

Previous research has suggested that sport-specific resistance training is a better way to yield positive performance results than other forms of cross training. Sport-specific resistance training relies on applying resistance to the same motions used in a sport's competition movements. For competitive swimming, this means swimming under a constant resistance applied in the opposite direction of forward motion. This type of training has recently been improved with the advent of a system that allows a swimmer to vertically lift a weighted bucket through a pulley system as they swim the length of the pool. The purpose of this study was to determine the relationship between a number of measured variables observed during "bucket" training and performance in a maximal 50-yd sprint freestyle effort. Twenty-six men ( $19.5\pm 1.21$  years,  $1.82\pm 0.07$ m,  $77.62\pm 8.19$ kg) and thirty women ( $19.00\pm 1.13$  years,  $1.69\pm 0.05$ m,  $64.91\pm 7.86$ kg) of the University of Wisconsin-La Crosse swimming team participated in the study. Three trials were conducted during weeks 1, 6, and 12 (T1-T3) of the competitive season. During each trial week, a 50-yd maximal effort freestyle sprint was used as a performance test. Two days later, two 25-yd trials were performed using the "bucket" system against a predetermined resistance while recording and averaging time, stroke count, and stroke rate. In addition, a swimming-specific anaerobic power test was used to determine peak force, average force, and the fatigue index of a maximal 30-sec tethered swim effort. The results show that the time to complete the 25-yd "bucket" test is the best predictor of performance in all three trials. However in T3, fatigue index for men and stroke count for women were additional predictors of performance in the stepwise regression analysis. For coaches and athletes using the "bucket" system, taking some simple measurements of common training variables may provide some insight into the performance enhancing value of the training program being implemented.

#### **G.14 Ecosystem Processes of Epilithic and Epixylic Periphyton in a Backwater of the upper Mississippi River**

Shane Symmank

Advisor: Eric Strauss, Biology

In large lotic aquatic systems like the upper Mississippi River (UMR), the majority of primary production is most often attributed to pelagic (free-floating) biological communities, or macrophyte communities. However, the ecological significance of benthic microbial communities is critical when assessing the quality of aquatic habitats. Benthic systems teem with aquatic microbes, many of which inhabit matrix-enclosed biofilms (i.e., periphyton) that contribute to key ecological processes such as primary production, community respiration, nutrient cycling, and secondary production. Evaluation of periphyton has long been used in small stream ecosystems to observe and monitor the effects of water chemistry, nutrient dynamics, hydraulic conditions, habitat availability, and food-web structure, on benthic communities. The objective of this study was to culture periphyton on three different types of artificial substrates (unglazed ceramic tile and two types of wood: poplar and pine) situated inside enclosures developed specifically to inhibit colonization by large macroinvertebrate grazers. The enclosures were deployed for three week incubations throughout the summer of 2010 in Target Lake, a backwater lake in Pool 8 of the UMR. Periphyton growth on the substrates was subsequently analyzed for biomass (i.e., chlorophyll a and AFDM), primary production, and secondary production. The study was complicated by record amounts of precipitation that caused unexpected fluctuations in enclosure depth at the study site, which resulted in significant variation in data among enclosure replicates. However, the novel enclosure design was a success and did allow for the quantification of periphyton biomass and ecosystem processes on the artificial substrates. The overall experimental design showed promise and could potentially be used for future studies to better understand how periphyton interacts with and influences other attributes of backwater ecosystems.

#### **G.15 Knowledge and Skills of School Psychologists Regarding Cognitive-Behavioral Therapy**

Raechel Torf

Advisor: Robert Dixon, Psychology

Current rates of depression create a demand for early intervention and prevention in the schools. As mental health providers within schools, school psychologists must demonstrate knowledge and skills in research-based treatments. Results demonstrate the level of competency of school psychologists in using manualized cognitive-behavioral therapy (CBT). Implications from this research include school psychologists' current knowledge and skills of manualized CBT and an exploration of interventions that may improve their competencies.

#### **G.16 Parent, Teacher, and Self Perceptions of Gifted Students' Social Skills**

Angela Goethel

Advisor: Jocelyn Newton, Psychology

Research is mixed regarding the social-emotional and psychological well-being of gifted students. Social skills competency supports many positive student outcomes. This study will compare teacher, parent, and self perceptions of social skills in the gifted and talented population and explore the potential influence of values and context on these ratings. Implications for practice will be considered to assist school psychologists in maximizing the well-being and potential of gifted students in the schools.

#### **G.17 Special Education and Regular Education Teachers' Perceptions of School Psychologists**

Jenna Semling

Advisor: Betty DeBoer, Psychology

The purpose of this study was to analyze regular education and special education teachers' perceptions of school psychologists. The current study will build on past research and include the amount of contact that both a special educator and regular educator had with school psychologists. Data analysis of teachers' perceptions will highlight implications to enhance the understanding of the role and services provided by a school psychologist.

## **G.18 Student-Teacher Relationships: Examining Connections to Relational Aggression**

Marie Schmidt  
Advisor: Robert Dixon, Psychology

This study looked at the predictive relationship between factors of the student-teacher relationship and adolescents' degree of involvement in the roles of relational aggression. The result document the specific factors of the student-teacher relationship that predict an increased likelihood for the adolescent to engage in one of the four roles of relational aggression. Implications and possible interventions for educators and school psychologists working in the middle schools will be discussed.

## **G.19 The Effects of Parental Attachment and Gender on Cyberbullying**

Ashley Morris  
Advisor: Betty DeBoer, Psychology

Through the accelerated advancement and reliance on technology, cyberbullying has increasingly become the latest threat to the mental health of adolescents. Previous research has recognized the association between quality of parental attachment and gender to the involvement in traditional bullying. This research will extend these factors to cyberbullying. The results will be used to identify points of intervention and suggest ways that teachers can positively affect students.

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

## **G.20 Responses of Injured and Non-injured Runners to Varying Midsole Hardness**

Ross Bodine, Mao Cheng, Alicia Duerst and Megan Plante  
Advisor: Stacey Meardon, Health Professions

Running is a cost effective and common form of recreational fitness. Unfortunately, running is also associated with high injury rates and running mechanics have been linked to injury. Research has shown that changes in footwear can alter biomechanical factors associated with running injury. However, responses to footwear changes vary between individuals; some individuals make neuromuscular adaptations to changes in footwear while others do not. The purpose of this study was to examine runners with and without a history of injury and their response to varying midsole hardness. We hypothesized that non-injured runners would adjust their running style in response to changing midsole hardness, whereas their injured counterparts would not. A sample of 24 recreational runners with and without history of injury was analyzed in this study. Three conditions of midsole hardness were examined: soft, medium and hard. Subjects ran along a 10m path over a force platform at their self-selected 5K training pace. 3D motion analysis was performed. A 2 X 3 ANOVA was used to compare key biomechanical variables in between groups under three conditions. Peak vertical loading rates and peak impact vGRF were significantly different between the three conditions ( $p=0.021$ ) and ( $p=0.007$ ) respectively, but not between groups. Knee flexion angle at peak impact vGRF changed under all three conditions ( $p=0.035$ ) in the non-injured group only. These results suggest both injured and non-injured runners made adjustments to midsole hardness as evidenced by the lower forces and loading rates in the hard condition. However, groups utilized different strategies to make these adjustments; the non-injured group appeared to make adjustments using sagittal plane knee flexion. Lack of significant changes in knee flexion angle in the injured group suggest this group made adaptations at other joints or with frontal or transverse plane knee motion.

## **G.21 How Running Mechanics Can Differ Between Running Shoes, Vibram Fivefinger (Bikila) and Barefoot.**

Caitlin McCarthy  
Advisor: John Porcari, Exercise and Sport Science

Purpose: Running is a popular aerobic exercise for a variety of individuals. A question many runners have is which running shoe will result in the least amount of injuries. Minimalist shoe companies claim that their shoes allow runners to feel like they are running barefoot while providing protection. The purpose of this study is to see how Vibram

Fivefingers (VF), a minimalist shoe, compares to barefoot and shod running when looking at ground reaction forces and biomechanics of running. Methods: 17 healthy, recreational female runners volunteered for this study. They were given a two week accommodation period in the VF and were asked to run in them for up to 20 minutes three times a week. Following this training, testing consisted of 5 running trials per shoe condition over a force platform. Each subject had reflective markers that were filmed with 120Hz using 8 cameras surrounding the platform. No runners were previously trained in VF or barefoot running prior to this study. They developed a running form that was most comfortable for them. / Preliminary Results: Initial results show that VF and Barefoot averages were similar to one another in regards to contact time, degree of plantarflexion, leg stiffness and degree of knee flexion when compared to running in New Balance running shoes. VF were closer to New Balance shoes with the degree of peak pronation. / Conclusions: This study supports the claims that VF make that their shoe is similar to barefoot running with an exception to pronation.

## **G.22 The Effects Of Cadence and Speed on In-Shoe Loading During Running**

Anna Stoecklein, Angela Guist and Chelsey Schadler  
Advisor: Thomas Kernozek, Health Professions

Running is a popular form of exercise that may lead to lower extremity injury due to aberrant plantar loading. Our purpose was to determine if altering running cadence and speed changed in-shoe peak force (PF), force time impulse (FTI), and contact time (CT). Methods: Thirty-eight 18-31 year old male and female subjects performed five running conditions wearing in-shoe sensors on a treadmill. A metronome determined each participant's normal cadence. Subjects ran by either increasing or reducing speed or cadence by 5% in a randomized order. Each subject ran for a set time where 20 steps of the right foot were measured by a computer sampling at 150 Hz. RM MANOVAs were used to assess differences in CT, FTI, and PF by plantar region for each speed/cadence combination. Post-hoc comparisons were conducted. Results: CT decreased with increased speed and increased cadence in all areas of the forefoot when compared to normal speed and cadence ( $p<0.05$ ). CT increased with reduced speed in all areas of the forefoot when compared to normal speed and cadence ( $p<0.05$ ). In the central forefoot, CT increased with reduced cadence ( $p<0.05$ ). In the heel, the FTI decreased with increasing speed and cadence and decreased with reduced speed ( $p<0.05$ ). In the heel, PF decreased with reduced speed and increased with reduced cadence ( $p<0.05$ ). In the central and medial forefoot, PF increased with increased speed ( $p<0.05$ ). Conclusion: With increased running speed there was a decrease in forefoot CT, FTI, and an increase in PF. With reduced speed there was an increase in forefoot CT and a decrease in FTI and PF. With increased cadence, there was a decrease in forefoot and heel CT and FTI. With reduced cadence, there was an increase in forefoot and heel CT and PF. Altering running speed or cadence may reduce plantar loading.

## **G.23 RPE Drift During Steady State Treadmill Exercise**

Lee Walraven  
Advisor: Carl Foster, Exercise and Sport Science

The ability to prescribe and monitor exercise can be a difficult task for health practitioners, especially without access to expensive exercise monitoring equipment. Previous studies have shown a drift upward in RPE during prolonged exercise. Purpose: The purpose of this study was to examine the use of the Talk Test (TT) to prescribe exercise and the effect on Rating of Perceived Exertion (RPE) over a 60 minute trial. Methods: The subjects were six men ( $22.3\pm 2.5$  years) and six women ( $20.3\pm 1.0$  years) who performed three exercise trials at last positive-1 (LP-1), last positive (LP), and equivocal (EQ) intensities, according to incremental TT responses. During each trial heart rate (HR), lactate (HLA), RPE, and TT score were recorded every ten minutes, along with a session RPE score 30 minutes following the exercise trial. Results: HR, HLA, RPE, and TT score were all significantly higher in the EQ trial compared to the LP and LP-1 trials. Session RPE and mean RPE were significantly higher in the EQ trial compared to the LP-1 and LP trials. There was no significant difference between HR, HLA, RPE, session RPE, mean RPE, or TT between the LP-1 and LP trials. Discussion: From this study we concluded that exercise can be safely prescribed and monitored using the TT when exercise intensities are prescribed from the LP and LP-1 stages of the TT.

## **G.24 The Physiological Effects of a 40-Minute ZUMBA® Fitness Session**

Mary Luetngen  
Advisor: Carl Foster, Exercise and Sport Science

This study was designed to determine the physiological effects of participating in a 40-minute ZUMBA® fitness session. Nineteen university subjects were monitored during a ZUMBA® class to determine the exercise intensity and energy expenditure of the session. The subjects were experienced at participating in ZUMBA® fitness classes. The

subjects performed a maximal graded treadmill exercise test in the laboratory to determine metabolic responses and allow development of an individual linear regression line of VO<sub>2</sub>-HR. HR responses were measured during the ZUMBA® fitness session and VO<sub>2</sub> and energy expenditure calculated from the individual regression line. HR zones were also determined for each subject using data gathered during the treadmill test based on the HR at the ventilatory (VT) and respiratory compensation (RCT) thresholds. Results for the study showed that during the ZUMBA® exercise session, subjects were exercising at an estimated  $63.5 \pm 10.5\%$  VO<sub>2</sub>max or  $63-69 \pm 10.5\%$  VO<sub>2</sub> reserve and  $79 \pm 7.0\%$  HRmax or  $117 \pm 10.5\%$  HRR, which is probably sufficient to increase aerobic capacity. The average energy expenditure was  $9.45 \pm 2.69$  kcal/min representing  $378 \pm 108$  kcal per 40 minutes of participating in a ZUMBA® fitness class. The time in easy, moderate and hard exercise zones was  $29.1 \pm 25.3\%$ ,  $54.4 \pm 23.7\%$ , and  $16.6 \pm 22.1\%$  respectively. Based on these results, ZUMBA® apparently meets the recommended guidelines from ACSM for improving cardiovascular fitness and improving and/or maintaining body weight.

### **G.25 The Rate of Perceived Exertion during a One Mile Walk vs. One Mile Run**

Maura Lesko

Advisor: Carl Foster, Exercise and Sport Science

**Purpose:** This study compared the linear relationship between RPE, intensity and pacing strategy during maximal effort exercise in a one-mile walk versus running a mile. **Subjects:** The subjects were 10 healthy adults (7 male, 3 female, mean age 21.2 years, range 18-27) **Methods:** Subjects performed a maximal oxygen consumption test in the laboratory and performed two part randomized trials of ambulating 1-mile, one walking, one running. All trials occurred on an indoor track and each lap is 1/8 of a mile. Practice trials were completed prior to the trials analyzed. The two trials were randomized so the subjects did not know if they would be walking or running ahead of time. Blood lactate concentrations were measured at the beginning and end of each trial. Each subject wore a heart rate monitor. Perceptual responses were measured every 200 meters using the Category Ratio Rating of Perceived Exertion (RPE) scale 0-10. Time for each half lap was recorded. The intensity of the trials was self regulated by the subject throughout the bout, without any limitations except to finish the mile as fast as possible via running and walking. **Results:** The running velocity during the one-mile run started out fast, evened out, then saw an end-spurt phenomenon where there was a terminal acceleration. In the walking trial the velocity remained the same throughout the walk with very little change in velocity. There was a linear growth in the RPE for both the running and walking trials. **Conclusion:** There was a linear relationship between RPE and intensity during the max running and walking trial. There was a steady increase in RPE during both trials. However, there was a much slower increase in RPE and intensity while walking and the drift was much less than the drift that occurs during running at a maximal pace.

### **G.26 The Effectiveness of the Shake Weight in Comparison to Traditional Dumbbells**

Jannah Hackbarth

Advisor: John Porcari, Exercise and Sport Science

**Background –** Patients with heart disease benefit from attending exercise and educational-based cardiac rehabilitation programs. The purpose of this study is to determine if the number of cardiac rehabilitation sessions attended or length of program enrollment affects patient outcomes. **Methods –** The data consisted of 14,666 patient records with entry and discharge data from the Wisconsin Cardiac Rehabilitation Outcomes Registry (WiCORE). The magnitude of the change scores of cardiac rehabilitation components were analyzed for patients attending 1-12, 13-24, and 25-36 sessions, as well as for patients enrolled in a cardiac rehabilitation program for 1-60, 60-90, and greater than 90 days. **Results –** Change scores of 14 different cardiac rehabilitation components were analyzed and included weight, waist circumference, body mass index, systolic blood pressure, diastolic blood pressure, total cholesterol, high-density lipoprotein, low-density lipoprotein, triglycerides, SF-36 physical component, SF-36 mental component, minutes per day of exercise, days per week of exercise, and volume of exercise. Patients who attended a greater number of sessions or were enrolled in cardiac rehabilitation longer improved the most. **Conclusions –** Although some of the changes in each component were significantly different ( $p < .05$ ) between the groups of patients, the actual differences were small. However, if a patient is striving to improve their health the greatest, he or she should attend the maximum number of sessions or continue cardiac rehabilitation the longest he or she can.



### **G.27 The Effects of P90X on Caloric Expenditure and Exercise Intensity**

Joel Woldt

Advisor: John Porcari, Exercise and Sport Science

P90X was the top selling Sports and Fitness item in 2009, but has little research to back its credibility. This study was designed to determine the energy cost and exercise intensity of four of the P90X workouts. Sixteen subjects (8 males, 8 females) completed treadmill VO<sub>2</sub>max tests to determine their aerobic capacity. Heart rate (HR) and oxygen consumption (VO<sub>2</sub>) were measured and a HR/VO<sub>2</sub> regression equation was determined. Subjects performed one workout per day with a minimum of 48 hours rest in between each session until all 4 DVD's were completed. Only HR was measured. Results are still being evaluated using statistical measures.

### **G.28 Comparing Outcomes of Secondary Prevention in Cardiac Rehabilitation Between Whites and Nonwhites**

Krista Masiak

Advisor: John Porcari, Exercise and Sport Science

Cardiac rehabilitation is a clinical program which assists heart patients with managing their cardiovascular risk factors and reducing their risk future cardiac events. Purpose: This study was designed to determine the percentages of nonwhites and whites which met secondary prevention goals, set by the American Heart Association, at baseline and discharge. The second purpose of the study was to compare the changes in specific variables between whites and nonwhites from baseline to discharge. Methods: The subjects were phase II cardiac rehabilitation patients in the Wisconsin Cardiac Rehabilitation Outcomes Registry (WiCORE) database, including 604 white subjects and 604 nonwhite subjects. Frequency and descriptive tests were used to determine what percentages of whites and nonwhites met the secondary goals. Chi Square was performed to analyze the significant differences between the groups when meeting secondary goals. Repeated Measures ANOVA and One Way ANOVA were used to examine the significant changes in risk factor reduction between whites and nonwhites and within the individual groups. Results: The results suggested there were several significant differences between the whites and nonwhites. Whites increased the volume of exercise ( $p=.015$ ) more, had greater loss of BMI ( $p=.005$ ), greater loss of weight ( $p=.004$ ), and a large gain in SF36PH scores. The results indicate whites receive more benefits from cardiac rehabilitation than non-whites.

### **G.29 Change in pace during time trials in relation to Hazard Score**

Corey Speaker

Advisor: Carl Foster, Exercise and Sport Science

During many races competitors can be seen making changes in velocity. This pattern seems to be dependent upon pacing strategy, which athletes develop in a template form with a concept known as 'teloanticipation'. These strategies are developed to avoid critical homeostatic disturbances. These disturbances can be monitored using the Rating of Perceived Exertion (RPE) scale. To maintain homeostasis and have optimal rate of increase in RPE athletes essentially have to compute a 'hazard' score to determine whether or not it's time for an endspurt or time to put on the brakes. The purpose of this study was to determine if the integration of momentary RPE and percent distance remaining (Hazard Score) explain these changes that can occur in pace. Methods: Twelve cyclists performed a maximal exercise test and five 10km time trials (TT). Two of the trials were for habituation and to obtain a baseline pace. Pace was manipulated for the first 1.5-4km of the three subsequent randomized experimental TTs, after which the remaining distance was completed as fast as possible. RPE, HR, power output (PO), and blood lactate concentration data was measured. Results: Hazard Scores between each trial were significant ( $p<0.05$ ). Hazard Scores of less than 1.0 indicated an increase in PO, whereas scores of greater than 3.0 indicated a decrease in power output. Conclusion: The integration of RPE and percent distance remaining seems to predict change in pace. This finding may become a helpful tool in terms of understanding how humans regulate their behavior during heavy physical work.

### **G.30 Quadriceps/Hamstring Ratio during 40 and 60 cm Drop Landing in College Aged Females**

Katlin Genthe and Chelsey Koehler

Advisors: Thomas Kernozek, Health Professions and Robert Ragan, Physics

Quadriceps/hamstring (Q/H) force ratios have been implicated as a risk factor for non-contact ACL injuries in female athletes. A higher Q/H force ratio is thought to be related to a higher incidence of injury. Some studies have suggested

that Q/H muscle activation ratio increases proportionally with increases in drop landing height but female ratios do not change. Our purpose was to compare peak and average Q/H force ratios based on dynamic simulations of experimental data collected from 40 and 60 cm drop landing heights. Methods. 15 females (mean age=23.9 yrs; mean height=117.1 cm; mean weight=66.9 kg) completed five trials each of two-legged drop landings from a 40 and 60 cm height. Kinematic and kinetic data from the trunk, pelvis, and legs were captured at 360 Hz using an eight-camera motion analysis system and two force platforms sampling at 2400 Hz. OpenSim software was used to create a dynamic simulation of the experimental drop landing data. Based on this dynamic simulation, the individual muscle forces of the quadriceps and hamstring forces were calculated. The peak and average Q/H force ratio was calculated and compared from each drop height using a paired t-test ( $p < 0.05$ ). Results. There was no difference between average and peak Q/H force ratio during the impact phase of landing at 40 and 60 cm heights ( $p = 0.335$ ;  $p = 0.128$ ). Conclusion. During drop landings, female Q/H force ratios may not change due to increases in drop height. This may indicate that other factors may be responsible for risk of ACL injuries during high risk performance skills such as landing.

### **G.31 Comparison of Quadriceps/Hamstring Ratio Using an Isokinetic Dynamometer Versus Estimates of Quadriceps/Hamstring Force from Dynamic Simulations of Drop Landing In College-Aged Females**

Christina Mixdorf and Christopher Hart

Advisors: Thomas Kernozek, Health Professions and Robert Ragan, Physics

Introduction: High quadriceps/hamstring ratios (Q/H ratio) may predispose an individual to non-contact ACL injury. Open kinetic chain isokinetic dynamometers are used to compare Q/H ratios of the patient during rehabilitation post ACL reconstruction. Some have speculated that these measures are related to actual Q/H ratios that occur during closed chain dynamic movements that have a high injury risk. Our purpose was to compare the Q/H muscle strength ratios using an isokinetic dynamometer and data from dynamic simulations of drop landing. Methods: Sixteen females (mean age=23.9, range 18-26) completed five drop landings from 40 and 60 cm. Using an eight-camera motion analysis system with a capture rate of 360 Hz and two force platforms sampling at 2400 Hz kinematic and kinetic data were collected. Knee strength testing was performed on the isokinetic dynamometer at speeds of 60 and 180 degrees/second. OpenSim Software was used to create a dynamic simulation of the drop landings and calculate peak quadriceps and hamstring muscle forces of the right limb. Q/H ratios determined from the isokinetic testing were then correlated to peak ratios from the drop landing simulation data using Pearson correlation coefficients. Results: Weak correlations between Q/H ratios occurred between isokinetic dynamometer and the dynamic simulation of drop landing data (60°/sec and 40 cm drop = -0.280, 60°/sec and 60 cm drop = -0.164, 180°/sec and 40 cm drop = 0.094, 180°/sec and 60 cm drop = -0.044). Conclusion: Isokinetic testing may not be related to Q/H ratios during drop landing. Therefore open kinetic chain testing may not be a good measure of Q/H ratios that predispose individuals to ACL injury during closed chain dynamic movements. It may be more beneficial to measure Q/H ratio in another way that better mimics the performance specifications during higher ACL risk activities.

### **G.32 Determination of Maximal Lactate Steady State Using the Talk Test**

Justine Lueck

Advisor: Carl Foster, Exercise and Sport Science

Purpose: Because of the relationship between training intensity and blood lactate, maximal lactate steady state (MLSS) can be a valuable tool to determine appropriate exercise intensity. The Talk Test has also been shown to be a valuable tool for exercise intensity in a variety of populations. This study was done to evaluate whether the Talk Test can be used to define MLSS. Methods: 14 subjects completed 2 maximal tests (one with gas exchange and one using the Talk Test) to determine the stages for the subsequent tests, which included: the stage the subject was unsure whether speech was comfortable (EQ), the last stage the subject could speak comfortably (LP), and the stage before the LP (LP-1). Following the determination of these speeds, they completed 30 minute steady state runs at each Talk Test identified intensities with measurement of blood lactate at 0,10,20, and 30 minutes to define whether MLSS is related to Talk Test intensity. Results: There was a significant relationship between heart rate and talk test condition as well as time. There was a significant relationship between RPE, talk test conditions, time, and talk test condition and time. There was a significant relationship between Talk Test score, Talk Test condition, time, and talk test condition and time. There was a significant relationship between lactate and talk test condition. Conclusion: In this population of highly trained individuals, most subjects were still below the intensity at the MLSS even when exercising at the EQ Talk Test intensity.

### **G.33 The Effectiveness of the StreetStrider as an Exercise Modality for Healthy Adults**

Jordan Becker

Advisor: John Porcari, Exercise and Sport Science

To determine if self-selected exercise using the StreetStrider meets ACSM guidelines for cardiorespiratory fitness. Secondly, to determine how self-selected exercise intensity using the StreetStrider compares to a stationary elliptical cross-trainer. Methods: Seven male (age  $29.0 \pm 11.18$  years) and eight female (age  $27.5 \pm 11.29$  years) adults performed three separate exercise tests including a 30 minute test at a self-selected pace on both the StreetStrider and on a stationary elliptical cross-trainer as well as a maximal test using the elliptical cross-trainer. The subjects completed a Physical Activity Enjoyment Scale (PACES) questionnaire after the two 30 minute exercise bouts rating their overall enjoyment of exercise. Results: Repeated Measures ANOVA indicated that self-selected exercise using the StreetStrider resulted in significantly greater heart rate ( $155 \pm 21.6$  vs.  $140 \pm 20.9$ ), percent HR max achieved ( $85 \pm 9.8$  vs.  $77 \pm 10.5$ ), VO<sub>2</sub> ( $30.5 \pm 3.65$  vs.  $27.0 \pm 5.76$ ), percent VO<sub>2</sub>max achieved ( $71 \pm 10.1$  vs.  $63 \pm 15.2$ ), and caloric expenditure per minute ( $11.5 \pm 3.23$  vs.  $10.2 \pm 3.50$ ) than exercise using a stationary elliptical cross-trainer ( $p < .05$ ). Perceived exertion, as measured using the Borg Scale, was significantly different among female subjects but not males. The PACES questionnaire showed a slight but insignificant increase in enjoyment of the StreetStrider compared to the elliptical cross-trainer. Conclusion: Self-selected exercise using the StreetStrider showed significantly increased cardiovascular demand and was enjoyed more compared to the elliptical cross-trainer. Exercise using the StreetStrider was successful at meeting ACSM guidelines for cardiorespiratory fitness.

### **G.34 Foot Strike Patterns while Running Barefoot, Shod, or in the Vibram FiveFinger Shoes**

Jordan Bjorhus, Thi Le and Amanda Harke

Advisor: John Willson, Health Professions

A rearfoot strike pattern, which is common among runners in traditional running shoes, may contribute to certain running-related injuries. A midfoot strike pattern, which is common among habitual barefoot runners, may minimize some factors associated with injury during running. However, it is unknown if inexperienced barefoot runners adopt a midfoot strike pattern when introduced to barefoot running or shoes intended to mimic barefoot running (minimalistic footwear). The purpose of this study was to determine if inexperienced barefoot runners adopt a midfoot strike pattern when introduced to barefoot running or minimalistic footwear. Nineteen healthy female runners participated in this study. Foot strike patterns were characterized as rearfoot or midfoot while subjects ran in traditional cushioned-heel running shoes, minimalistic footwear, and barefoot. All subjects then trained in minimalistic footwear 3 times per week up to 20 minutes per session for 2 weeks and foot strike patterns were re-analyzed. The proportion of runners with a midfoot strike pattern in the minimalistic footwear and barefoot conditions before and after training was compared with the proportion of midfoot strikers in standard shoes using two-sided McNemar exact tests ( $\alpha = .05$ ). Our results show that no subjects utilized a midfoot strike pattern in the standard running shoes before and after training. Before training, a midfoot strike pattern was identified in 26% of subjects in minimalistic footwear ( $p=.06$ ) and in 42% of subjects when running barefoot ( $p=.008$ ). After training, 47% ( $p=.008$ ) and 53% ( $p=.004$ ) of subjects ran with a midfoot strike pattern in minimalistic footwear and barefoot, respectively. These results indicate that a significant proportion of female runners with no barefoot running experience will naturally switch to a midfoot strike while running barefoot or in the minimalistic shoes. Two weeks of training with minimalistic shoes does not appear to affect strike pattern while running.

### **G.35 Immediate Effects of Minimalistic Footwear on Vertical Loading Rate in Female Runners**

Nate Bothfeld

Advisor: John D Willson, Health Professions

Up to 70% of runners sustain an injury over any one-year period. Rate of impact loading has been implicated in the etiology of many overuse running injuries. Rate of loading may be reduced by adopting a midfoot strike pattern; a pattern common among people who traditionally run barefoot. The Vibram FiveFinger (VF) is a popular minimalistic shoe purported to simulate a barefoot experience. Research testing this claim is scarce and has utilized all male subjects with differing degrees of barefoot running experience. The purpose of this study was to evaluate the immediate effects of minimalistic footwear on rate of loading relative to barefoot running, among female runners. In this study, nineteen healthy female runners with no prior barefoot running experience ran over-ground ( $3.52$ - $3.92$  m/s) while shod in traditional running shoes (TS), the VF, and barefoot (BF). Vertical loading rate and ankle angle at footstrike data were recorded for five foot contacts per condition using 3-D motion analysis and a force platform embedded in the runway.

Differences between conditions were evaluated using a repeated measures ANOVA ( $\alpha = 0.05$ ). Our results show that loading rate while running in the VF shoes (121.29 BW/s) was not different than running BF (109.56 BW/s) ( $p = 0.05$ ). However, loading rates in both the VF and BF condition were greater than the TS condition (76.1 BW/s) ( $p = 0.05$ ). Dorsiflexion angle at initial contact was smallest in the BF condition (1.94 deg), followed by VF (4.37 deg) and TS (12.12 deg) ( $p = 0.05$ ). These results suggest that among runners with no previous barefoot running experience, the average immediate response to running with VF or BF may be higher loading rates and smaller ankle angles at initial contact. Higher loading rates may increase an individual's risk for certain running-related overuse injuries.

### **G.36 Grading Practices: Differences in Secondary Teachers**

Melanie Hill

Advisor: Robert Dixon, Psychology

Grading practices can create some controversy within secondary schools as teachers can vary in their beliefs and practices in grading assignments. The four core research-based practices are examined in homework and grading practices between a variety of teachers: middle versus high school, teaching experience and subject area. Results and implications to the schools will be explored. Attendees will learn the best practices in grading and which teachers tend to adhere to these practices.

### **G.37 Multicultural Competence of School Psychologists**

Stephanie Sabinash

Advisor: Jocelyn Newton, Psychology

This poster summarizes a research project examining multicultural competence of school psychologists. A subset of Wisconsin school psychologists completed a demographic questionnaire and a self-report cultural competence survey. Analyses highlights whether school psychologists differ in perceived multicultural competence as a function of selected demographic variables. Poster attendees will have the opportunity to examine data that has implications for both training programs and professional organizations to best facilitate multicultural competence in current and future school psychologists.

### **G.38 Factors of Resiliency and Depression in Adolescents**

Michelle Anderson

Advisor: Jocelyn Newton, Psychology

Despite multiple studies indicating that as overall resilience increases, overall level of depression decreases, little is known about the specific factors that contribute to this relationship. This poster will examine the predictive relationship between factors of resilience (equanimity, existential aloneness, meaning, perseverance, and self-reliance) and level of depression in adolescents. With greater understanding of this relationship, school psychologists can better support students' mental health needs, both as a preventive measure and for intervention purposes.

### **G.39 Parent Involvement Within Hmong Families**

Kelly Blackburn

Advisor: Jocelyn Newton, Psychology

The purpose of this poster presentation is to examine parent involvement within the Hmong population. The effects of parent involvement and the acculturation on student academic achievement within the Hmong culture were analyzed. This presentation will inform attendees of the current level of family involvement of Hmong parents and provide recommendations for how best to optimize parent involvement within the Hmong culture.

### **G.40 Reactive Attachment Disorder: A Needs Assessment of School Psychologists' Knowledge**

Emilie Ratter

Advisor: Betty DeBoer, Psychology

There are approximately 800,000 children with severe attachment disorders that are entering the child welfare system each year, many of these children being school age. Reactive Attachment Disorder (RAD), the most severe form of

attachment disorders, is a complex disorder with many controversial positions on assessment and intervention. This study will investigate school psychologists' perceived knowledge of RAD. Participants will learn more about research-supported positions on RAD with implications for professional development.

#### **G.41 Social Predictors of Adolescent Involvement in Relational Aggression**

Maureen Hampton  
Advisor: Robert Dixon, Psychology

The use of relational aggression to damage social relationships has many potential negative effects for adolescent youth today. Social factors (i.e., perceived popularity and social preference) have been studied regarding their effects on involvement in overt bullying. This study will extend these social predictors of involvement in overt bullying to covert bullying (relational aggression) and examine possible gender differences in middle school adolescents. Implications for educators and school psychologists will be further discussed.

#### **G.42 Relationship between Sessions Attended and Outcomes in Outpatient Cardiac Rehabilitation**

Kristin Miller  
Advisor: John Porcari, Exercise and Sport Science

Patients with heart disease benefit from attending exercise and educational-based cardiac rehabilitation programs. The purpose of this study is to determine if the number of cardiac rehabilitation sessions attended or length of program enrollment affects patient outcomes. / Methods – The data consisted of 14,666 patient records with entry and discharge data from the Wisconsin Cardiac Rehabilitation Outcomes Registry (WiCORE). The magnitude of the change scores of cardiac rehabilitation components were analyzed for patients attending 1-12, 13-24, and 25-36 sessions, as well as for patients enrolled in a cardiac rehabilitation program for 1-60, 60-90, and greater than 90 days. / Results – Change scores of 14 different cardiac rehabilitation components were analyzed and included weight, waist circumference, body mass index, systolic blood pressure, diastolic blood pressure, total cholesterol, high-density lipoprotein, low-density lipoprotein, triglycerides, SF-36 physical component, SF-36 mental component, minutes per day of exercise, days per week of exercise, and volume of exercise. Patients who attended a greater number of sessions or were enrolled in cardiac rehabilitation longer improved the most. / Conclusions – Although some of the changes in each component were significantly different ( $p < .05$ ) between the groups of patients, the actual differences were small. However, if a patient is striving to improve their health the greatest, he or she should attend the maximum number of sessions or continue cardiac rehabilitation the longest he or she can.

## GRADUATE ORAL PRESENTATION ABSTRACTS

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### **GRAD.1 Developing Tools, Methods and Procedures to Support Farm to School Program Evaluation in La Crosse County, WI**

Bethany Kies and Josh Miner

Advisor: Dan Duquette, Health Education and Health Promotion

In order to provide the Farm to School (F2S) team working at the La Crosse County Health Department with the tools necessary to conduct comprehensive program evaluation, a family survey tool, a student focus group methods guide, and a plate waste study protocol were developed. These tools meet current needs by providing a means to gather qualitative student feedback and quantitative data on the amount of food eaten by individual students and family knowledge and attitudes. The development of these tools began with a literature review and interviews with key stakeholders, including school food service staff and F2S Program coordinators. The tools then underwent various validity efforts and were pilot-tested in one of the school districts within the county bounds before the final drafts and recommendations for use were developed. The tools are anticipated to be used in F2S Program evaluation in 4 school districts during the Spring and Fall of 2011. Due to the collaborative approach that was taken in the development of these tools, as well as the focus on 3 methods of evaluation within 2 different populations, these tools will allow for more accurate and comprehensive F2S Program evaluation to be completed.

### **GRAD.2 Supporting Supermom: A Needs and Capacity Assessment of Working Mothers at Logistics Health Inc. in La Crosse, WI**

Brittany McIlquham

Advisor: Keely Rees, Health Education and Health Promotion

Functioning as a productive member of society with a full time job is stressful enough. Employed parents have dual roles to fulfill both at home and work. According to the U.S. Census Bureau, in 2008, approximately 24% of the U.S. workforce were parents with children under the age of 18 years old. Support for employed parents is desperately needed, from their spouse, family, friends, and maybe, most importantly, their employer. Mothers, in particular, tend to be more involved at home, therefore may need more support and flexibility from their employers. The current study is a needs and capacity assessment of working mothers employed by Logistics Health Incorporated (LHI), in La Crosse, WI. The needs of the women and their capacity to meet them were evaluated with the use of focus groups and key informant interviews. Of the 24 working mothers who participated, a wide variety of needs were unveiled. Needs and capacities were related to worksite wellness programming. Some women were in need of more support from their spouses and family. Guilt was a major theme, with dual-parent versus single-parent households as another major discussion generator. However, an overall sense of pride was shown by most women, as they felt they were doing the right thing for their family by working. Overall these working mothers felt like they were not alone in their daily struggles and triumphs of trying to balance motherhood and the corporate work environment.

### **GRAD.3 Upper Midwest Environmental Science Center Sand Prairie as a Model for Identification and Classification of Plants in a Middle School Science Classroom**

Nicole Hoffman

Advisors: Gary Willhite, Educational Studies and Tim Gerber, Biology

Project 2061's Benchmarks for Science Literacy provides educators with specific learning goals that should be used as a basis for curriculum development. This research consists of a lesson based on Project 2061's Benchmarks for Science Literacy. The lesson provides middle school science teachers with a curriculum framework to have students observe basic plant structures and use that basic knowledge to be able to identify a plant. This lesson engages students in the opportunity to observe the similarities and differences in many different types of plants. Students identify plants using a basic field guide. That basic field guide organizes related plants based on families. Students become familiar with how plants are classified by related groups of organisms into families. Once students feel comfortable identifying and classifying plants, they have to tools and skills to research the interdependence of life of a particular plant community.

**2010 RECIPIENTS OF  
UNDERGRADUATE RESEARCH AND CREATIVITY GRANTS**

<b>Name</b>	<b>Department</b>	<b>Mentor</b>	<b>Title</b>
Andrew Appold	Theatre Arts	Beth Cherne	<i>The Magic Behind Character Transformation</i>
Amanda Bailey	Mississippi Valley Archaeology Center	Connie Arzigian	<i>Resource Procurement at the Pammel Creek Oneota Site</i>
Amanda Bailey	Mississippi Valley Archaeology Center	Connie Arzigian	<i>Intersite Analysis of Burials at the Carson Mounds Site</i>
Brandon Bankes	Theatre Arts	Mandy Hart	<i>Puppetry and Prague: Creativity and Research From Around the World</i>
Brent Bankes	Theatre Arts	Mandy Hart	<i>Video Projections In Modern Theater</i>
Elena Bantle	Political Science and Public Administration	Jo Arney	<i>Rural Aysen Residents and Assessing the Park Creation Response Continuum</i>
Andrew Barazia, Wesley Bickler	Biology	Nicholas Downey	<i>Investigation of Maintenance of the Kinetoplast in Trypanosoma Brucei</i>
Emily Bergman	Modern Languages	Darlene Lake	<i>Public Health Care For Adolescent Girls in Costal Ecuador</i>
Aiyana Bloome	Communication Studies	Dena Huisman	<i>Short Courtship and Early Marriage in the Military</i>
Molly Boss	Archaeology/Sociology	Nicholas Bakken	<i>Desistance of Substance Use: Agents of Informal Social Control</i>
Adia Brooks	Political Science	Cecilia Manrique	<i>Brazil's Racial Politics: The Afro-Brazilian Perspective</i>
Lindsay Brown, Cayla Duffy, Stephanie Gray	Biology	Nicholas Downey	<i>Localizing Proteins Involved in Kinetoplast-Flagellum Link in the Trypanosoma Bruceia</i>
Alyssa Buchman	Sociology and Archaeology	Christine Hippert	<i>Using Photovoice Research to Evaluate the Impact of the Gardening Experience on the Social Development of Preschoolers</i>
Luci Flood, Amanda Bulgrin	Psychology	Betsy Morgan	<i>Piecing Together the Puzzle: The Refinement of the Autism Attitudes Inventory</i>
Eric Busse	Theatre Arts	Beth Cherne	<i>Cardboard Citizen: Empowering the Homeless</i>
Lauren Byrne, Melanie Tate	Psychology	Bianca Basten	<i>The effects of societal versus professor stereotype threats on female math performance</i>
Sasha Chihak	Chemistry	Nadia Carmosini	<i>Quantification of Triclosan Binding to Dissolved Organic Carbon Materials</i>
Katlyn Christensen	Communication Studies	Tony Docan-Morgan	<i>Breaking the Silence: Selective Mutism and its Treatment in the School Setting</i>
Alison Clare	Education Studies	Peter Stovall	<i>Multiculturalism and Education in K-12 Bolivian Education</i>
Sarah Higley, Heather Johnson, Keriann Noga	Art	Joel Elgin	<i>Exploring the Additive Process of Intaglio Printmaking</i>
Bridget Comee, Saskia Richter	Exercise and Sport Science	Mark Gibson	<i>Effects of Moderate Exercise on Neurocognitive Function</i>
Kyle Danielson	Biology	Robin Tyser	<i>Cutting the Fat in Beef Production</i>
Eliana De La Rosa	Sociology and Archaeology	Joseph Tiffany	<i>Burial Treatment of Women in Sanisera: Understanding the cultural identity of women in 5th to 7th century Menorca, Spain</i>

<b>Name</b>	<b>Department</b>	<b>Mentor</b>	<b>Title</b>
Rourke Decker, Katherine Anne Josephson	Biology	Greg Sandland	<i>Toward a New Model for Autoimmune Disorders: Bimodal Parasite Therapy in Systemic Lupus Erythematosus (SLE)</i>
Stephanie Sandor, Michelle Eddy	Psychology	Carmen Wilson; Katherine Kortenkamp	<i>Preceptions of Rape perpetrators Based on Skin Tone, Attire and Relationship to Victim</i>
Jake Edwards	Sociology and Archaeology	Nicholas Bakken	<i>Risk Factors of Violent Crimes</i>
Karen Epp	Economics	Nabamita Dutta	<i>Investigation Freedom of Press and the Empowerment of Women: A Global Analysis</i>
Sara Erickson	Geography and Earth Science	Colin Belby and Ryan Perroy	<i>Measuring the Spatial Distribution of Lead Contaminants in La Crosse River Marsh</i>
Tylor Fischer	Art	Donald Sloan	<i>A search for the Historical Impact of Early Greek Art and Architecture in Modern Society.</i>
Tricia Flaherty	Geography and Earth Science	Ryan Perroy	<i>Mapping the Spread of Invasive Fennel on Santa Cruz Island</i>
Greta Foley	Oncology Research	Simon Shelley	<i>Establishing CD43 as Prognostic and Diagnostic Tool</i>
Erin Fraundorf	Modern Languages	Darlene Lake	<i>Oral Health Education of Children in Coastal Ecuador</i>
Natalie Goodman	Theatre Arts	Beth Cherne	<i>Creating Theatre: An Exploration of the Playwright's Role in Collaborative Theater.</i>
Megan Gosse	Sociology and Archaeology	Nicholas Bakken	<i>Risk and Protective Factors of Adolescent Delinquency</i>
Kelsey Greenwood	Psychology	Dung Ngo	<i>Shaken and Moved: Posttraumatic Stress Disorder in Haitian Earthquake Survivors</i>
Megan Gross	Biology	Jennifer Miskowski	<i>Screening Potential Anthelmintic Compounds for Novel Activity</i>
Christopher Herbst	Health Education	Gary Gilmore	<i>A Portrait of Contemporary Dental Care in Ecuador</i>
Nicholas Herro	Economics	James Murray	<i>Measuring Uncertainty in Central Bank Decisions and its Impact on Macroeconomic Outcomes</i>
Sarah Higley, Heather Johnson, Keriann Noga	Art	Joel Elgin	<i>Investigating Color Intaglio Printmaking in Bargo, Italy</i>
Brian Hill	Geography and Earth Science	Ryan Perroy	<i>High-resolution Mapping of Heavy-metal Soil Pollution in Elbasan, Albania using Portable X-ray Fluorescence</i>
Shannon Holliday	Biology	Margaret Maher	<i>Erythrocyte fatty acid content alterations with dietary restriction and refeeding</i>
KaWai Hui	Chemistry	Heather Mortell	<i>Synthesis of Unusual Amino Acid</i>
Cassandra Jens	Mathematics	Robert Allen	<i>Using Cellular Automata to Model the Outbreak of a Zombie Infection with Imposed Social Dynamics</i>
Kelsey Jorgensen	Psychology	Casey Tobin	<i>Perceptions of Relationship Conflict as Predicted by Adult Attachment and Self-Esteem</i>
Erik Kahl	Modern Languages	Darlene Lake	<i>Understanding, Experiencing, and Appreciating Shrimp: A Narrative of the Shrimp Farming Industry of Coastal Ecuador</i>



<b>Name</b>	<b>Department</b>	<b>Mentor</b>	<b>Title</b>
Maren Kallaus	Communication Studies	Sara Docan-Morgan	<i>An Explanation of how Hmong Immigrant Parents Communicate with First Generation Teenagers about Health Behaviors</i>
Alyson Kelsey	Exercise and Sport Science	Cordial Gillette	<i>Social Support Between Athletic Trainers</i>
Jessalyn Kimball, Britany Vogt	Art	Joel Elgin	<i>The Italian Renaissance: The Blending of Art and Science</i>
Molly Koby	Psychology	Betsy Morgan	<i>How Could They Let This Happen? : Blame Judgements Following School Shootings</i>
Dino Kozidis	Sociology and Archaeology	Carol Miller	<i>Islamophobia and the Media</i>
Shelby Krarup	Theatre Arts	Joe Anderson	<i>A Victorian Phantom</i>
Stephanie Kulow, Sarah Stump	Exercise & Sports Science	Scott Doberstein	<i>The Effects of Time of Day on Power Output Performance</i>
Elizabeth Lamb	Sociology and Archaeology	Joseph Tiffany James Theler	<i>Utilization Analysis and Identification of Fresh Water Mussels from the Glenwood Locality, Iowa</i>
Catherine Landon, Nicolass Van Oss	Psychology	Ryan McKelley	<i>Pissed Drunk: The Effects of Anger on Binge Drinking Behavior</i>
Katelyn Larsen	Political Science and Public Administration	Jo Arney	<i>The Endangered Species Act and its Impacts on Gray Wolf Recovery in Yellowstone National Park</i>
Andrea Joy Larson	Modern Languages	Darlene Lake	<i>An investigation into the Industries of Coastal Ecuador: An exploration into the management structures of Shrimping and Cacao farming in costal Ecuador</i>
Sarah Leschisin	Geography and Earth Science	Ryan Perroy	<i>Examining Soil Properties along an Island Chronosequence in the Upper Mississippi River</i>
Quinn Lewis	Geography and Earth Science	Colin Belby	<i>Field Testing Residential Infiltration Rates and Calculating Urban Runoff in La Crosse, WI</i>
Sarah Malone	Sociology and Archaeology	Nicholas Bakken	<i>How Jimmy Aced his Exam: Theoretical Explanations for Prescription Drug Abuse on College Campus</i>
Katharine Malterer	Exercise and Sport Science	Carl Foster	<i>Decision Making Relative to Pacing Strategy in Running: Test of the Hazard Score Hypothesis</i>
Brianna Marshall	UW-L Special Collections	Teri Talpe	<i>A Century of Student Voice: The Racquet from 1910-2010</i>
Jessie Mcallister	Psychology	Emily Johnson	<i>The Relations Between Academic Achievement and Depression in Middle School Students</i>
Allyson McElligott	Psychology	Bianca Basten	<i>Who's to Blame? : Perceptions of Domestic Violence in Biracial Relationships</i>
Brandon Miles	Economics	Kathryn Birkeland	<i>An Economic and Financial Analysis of the Ethanol Industry</i>
Melody Miller	Biology	Bradley Seebach	<i>Alpha-Motor Neuron in Mamalian Neonates</i>

Name	Department	Mentor	Title
Robert Mooney	Biology	Eric Strauss and Roger Haro	<i>Consumer-Driven Nutrient Recycling Between a Steam-Dwelling , Keystone Herbivore and its Periphyton Resources</i>
Leah Morgan, Tiffany Terp	Biology	Nicholas Downey	<i>The Role of the Protein Tb 927.10.2950 on Kinetoplast Separation of Trypanasoma Brucei</i>
Leah Mortensen	Education Studies Sociology and Archaeology	Peter Stovall and Christine Hippert	<i>Integrating Indigenous Knowledge in Education of the Pirwa of Huancarani, Bolivia</i>
Ellen Danforth, Shawn Olichwier	Art	Joel Elgin	<i>Metal and Stone: The Synthesis of Intaglio and Lithiography</i>
Alex Parker	Sociology and Archaeology	Christine Hippert	<i>Resources Available to Women Affected by HIV/AIDS in Botswana</i>
Ellen Poeschel	Modern Languages	Jean Janecki	<i>Exploring Methodologies in Foreign Language Learning through the Use of Music and Technology</i>
Lindsey Purl, Cortney Draxler	Health Education	Keely Rees	<i>A Cross Cultural Comparison between the United States and Ireland: Exploration of Factors Influencing Body Image among Adolescent Girls</i>
Lucas Purnell	Political Science	Jo Arney	<i>What's On the Line: How Asian Carp Can Decrease Property Value in Chicago</i>
Angela Rooker	Sociology and Archaeology	Christine Hippert	<i>The Effect of the Migrant Experience in the United States on Family Dynamic in Mexico</i>
Melissa Rupilinger	Economics	Nabamita Dutta	<i>The Robe of Personal Investment in the Effectiveness of Two BioSand Water Filter Programs in Nicaragua</i>
Leah Schiller	Microbiology	Diane Sewell	<i>Isolating Geography and Non-Native Culture: Their Impacts on Nutrition in Patagonia</i>
Susan Schmidt	Sociology and Archaeology	Enilda Delgado	<i>Work-Life Conflict: Factors Associated with Negative Spillover from Home to Work</i>
Justin Schmitz	Theatre Arts	Amanda Hart	<i>Lighting: A London Study of Professional Theatrical Lighting for "Lend Me aTenor-The Musical"</i>
Ashley Schultz	Mississippi Valley Archaeology Center	Constance Arzigian	<i>An Analysis of Floral Remains and their Correlations to Seasonal Movement at the Sand Lake Site</i>
Ashley Schultz	Biology	Anita Baines	<i>Tracking the Spread: A Look at Hypo Virus Mediated Recovery in West Salem, WI</i>
Katherine Schwantes	Mississippi Valley Archaeology Center	Connie Arzigian	<i>Caves, Plazas, and Gods: The Impact of Geomorphology on Taino Utilization of Ceremonial Sites</i>
Lindsay Schweitzer	Mississippi Valley Archaeology Center	Connie Arzigian	<i>Analysis of Oneota Storage Pits at the 47Lc45-3 Sand Lake Site</i>
Elizabeth Seramur	Microbiology	Bernadette Taylor	<i>Virus Neuralization Response to Low Dose intradermal Vaccination versus Intramuscular influenza Vaccination</i>
Kirk Benson, Nathaniel Shields	Art	Joel Elgin	<i>Subtractive Intaglio in Italy: An Atelier's Experience</i>
Jeff Siegenthaler	Psychology	Alex O'Brien	<i>The Effects of Altering Songs on Likeability: a Mere Exposure Study</i>
Kari Soltau	Biology	Anita Baines	<i>Sprout Dynamics of American Chestnut Trees</i>

<b>Name</b>	<b>Department</b>	<b>Mentor</b>	<b>Title</b>
Daniel Schaefer, Joseph Sperlack	Exercise and Sport Science	Dennis Kline	<i>Prioritizing Power and Performance</i>
Philip Strandwitz	Microbiology	Bonnie Bratina	<i>A Co-Culture Approach for Identifying Bacteria in the Intestinal Tract of Arion Fasciatus</i>
Gaelle Talhouarne	Biology	Scott Cooper	<i>Understanding the Differences in Fibrinolysis Rate Between Hibernating and Non- hibernating Ground Squirrels</i>
Andrew Verhoeven	Recreation Management and Therapeutic Recreation	Patricia Ardivino	<i>A Comparison of Recreation Programs for Children with Disabilities in Appleton WI, and Bunche Ecuador</i>
Derek White	Chemistry	Paul Miller	<i>Removal of Groundwater Contaminant via Latex Transportations of a Bimetallic Catalyst</i>
Kyle Wojcik	Biology	Bradley Seebach David Howard	<i>Investigating the Role of Acute Application of NT-3 in Up-Regulation of p<sup>75</sup>-TrkC Hetero Complexes in Neonatal Rat Spinal Neurons Using Immunoflourescence in Conjunction with Confocal Microscopy</i>
Anna Wooden	Theatre Arts	Joe Anderson	<i>The Prague Quadrennial: Alternative Materials for use in Theatrical Costuming</i>
Megan Woodward	Women's, Gender and Sexuality Studies	Mahruq Khan	<i>The Representation of Women in the Media: Information Resulting from Participating in Feminist Winter Term 2001</i>
Joane Clark, Olivia Radke and Ali Wesner	Art	Joel Elgin	<i>Exploring the Additive Process of Intaglio Printmaking</i>

**2010 RECIPIENTS OF THE GRADUATE RESEARCH,  
SERVICE AND EDUCATIONAL LEADERSHIP AWARDS**

<b>Student's Name</b>	<b>Department</b>	<b>Faculty Sponsor</b>	<b>Title</b>
Bailey, Sean	Biology	Mark Sandheinrich	<i>Assessing the Utility of Larval Dragonflies as Mercury Biosentinels in Inland Freshwater Ecosystems</i>
Bauer, Katie	Microbiology	Bernadette Taylor	<i>Antibody Response to Influenza Virus Protein Neuraminidase after Intradermal versus Intramuscular Vaccination</i>
Becker, Jordan	Exercise and Sport Science	John Porcari	<i>The Effectiveness of the Street Strider as an Exercise Modality for Healthy Adults</i>
Bischel, Samantha	Exercise and Sport Science	Carl Foster	<i>Successive Changes in Pacing Strategy in Various Age Groups</i>
Burrows, Margaret	Exercise and Sport Science	Emmanuel Felix	<i>Physical Activity and Stress Levels among Parents of Children with Autism</i>
Ganser, Alissa	Biology	Roger Haro	<i>Effects of Sub-lethal Temperatures on the Oxygen Consumption of Adult and Juvenile Freshwater Mussels</i>
Gaveske, Hannah	Exercise and Sport Science	Mark Gibson	<i>High School Coaches' Knowledge of Prevention, Recognition and Management of Concussions</i>
Goethel, Angela	School Psychology	Jocelyn Newton	<i>Parent, Teacher and Self Perceptions of Gifted Students' Social Skills</i>
Hackbarth, Jenna	Exercise and Sport Science	John Porcari	<i>The Effectiveness of the Shake Weight in Comparison to Traditional Dumbbells</i>
Hagen, Jana	Exercise and Sport Science	Carl Foster	<i>The Effect of Music on Time Trial Performance</i>
Holthusen, Jordan	Exercise and Sport Science	John Porcari	<i>Hooked on Hooping</i>
Hulseberg, Christine	Microbiology	Mike Hoffman	<i>Identification of a Novel Late Domain in Human Parainfluenza Type 3 Matrix Protein</i>
Kelly, Patrick	Biology	Roger Haro	<i>Effects of Bighead and Silver Carp on Aquatic Insect Emergence in the Upper Mississippi</i>
Kies, Bethany	Health Education and Health Promotion	Dan Duquette	<i>Evaluation of an Inaugural F2S Program: Development of Tools and Protocols for Selected Evaluation Methods to be used in La Crosse County Wisconsin/Communities Putting Prevention to Work F2S Evaluation Program</i>
Kuffel, Nick	Exercise and Sport Science	Rich Pein	<i>The Effects of Sport-Specific Resistance Training on Performance of NCAA Division III Competitive Swimmers</i>
Laukkanen, Katri	Biology	Mark Sandheinrich	<i>Photosynthetically Active Radiation (PAR) Influence on Microhabitats of Sculpin in Southwest Wisconsin Streams</i>
Lesko, Maura	Exercise and Sport Science	Carl Foster	<i>The Rate of Perceived Exertion During a One Mile Walk versus One Mile Run in Adults</i>
Leuck, Justine	Exercise and Sport Science	Carl Foster	<i>Determination of Maximal Lactate Steady State using the Talk Test</i>
Luetzgen, Mary	Exercise and Sport Science	Carl Foster	<i>The Physiological Effects of Participating in a 40-Minute Zumba® Session</i>

<b>Student's Name</b>	<b>Department</b>	<b>Faculty Sponsor</b>	<b>Title</b>
Masiak, Krista Miller, Kristin	Exercise and Sport Science	John Porcari	<i>Comparing Outcomes of Cardiac Rehabilitation Secondary Prevention in Whites and Nonwhites</i>
McCarthy, Caitlin	Exercise and Sport Science	John Porcari	<i>How Running Mechanics Can Differ Between Vibram Fivefingers (Bikila) Running Shoes and Barefoot</i>
Mchugh, Maighread (Maggie)	Master of Education Professional Development	Jennifer Kosiak	<i>A Children's Story: Creating Connections between Hmong Culture and Mathematics</i>
McIlquham, Brittany	Health Education and Health Promotion	Keely Rees	<i>Taking a Route Less Traveled: Approaching the Disconnect Between Parents and Their Pre-adolescent Children Through the Worksite</i>
Nettesheim, Neal	Biology	Bradley Seebach	<i>Effect of Gluteal Latency on Drop Jump Performance</i>
Nogle, Amanda	Health Education and Health Promotion	Gary Gilmore	<i>A Celebration of the La Crosse Choice: Communicating the Healthy Choice to Our Community</i>
Rentschler, Ann	Microbiology	Bill Schwan	<i>Regulation of Uropathogenic Escherichia coli fimB and fimE genes by OmpR</i>
Roesch, Michelle	Master of Education Professional Development	Amy Stoeckly	<i>What Effect Does Implementing the Daily Five Reading Model, along with the Café Assessment System, have on Third Graders?</i>
Speaker, Corey	Exercise and Sport Science	Carl Foster	<i>Change in Pace During Time Trials in Relation to Hazard Score</i>
Symmank, Shane	Biology	Eric Strauss	<i>Ecosystem Processes of Epilithic and Epixylic Periphyton in a Backwater Lake of the Upper Mississippi River</i>
Voit, Amber Wulff Plumb, Kelly	School Psychology	Rob Dixon	<i>Cultural and Linguistic Immersion in Panama</i>
Walker, Ben	Biology	Greg Sandland	<i>Bithynia tentaculata Populations and Parasite Infection Status in the Upper Mississippi River National Wildlife and Fish Refuge (UMRWFR)</i>
Walraven, Lee	Exercise and Sport Science	Carl Foster	<i>The Effect on Session RPE During Varying Levels of Intensity and Duration During Treadmill Exercise</i>
Woldt, Joel	Exercise and Sport Science	John Porcari	<i>The Effects of P90X on Caloric Expenditure and Exercise Intensity</i>

# CONGRATULATIONS – GRADUATE STUDENTS!

## 2010 Graduate Thesis Award Recipient:

Christine Maslonkowski - Master of Public Health in Community Health Education

Mentor: Gary Gilmore

*A SWOT Analysis of Conducting Medication Disposal  
Programs in Wisconsin Communities.*

## 2010 Graduate Academic Achievement Award Recipients:

Gregory Lovell – Master of Education - Professional Development

Mentor: Rick Stewart

Peter Fitschen – Biology: Physiology

Mentor: Margaret Maher

# 2010-2011 Undergraduate & Graduate Committees

## Undergraduate Research Committee Members & Consultants

- Anita Baines
- Gretchen Berns
- Kathryn Birkeland
- Keely Rees
- Tony Docan-Morgan
- Nicholas Downey
- Emily Johnson
- Marti Lybeck (Spring 2011)
- Aric Opdahl (Fall 2010)
- Soojin Yoo
- Andrew Arend, Student Representative (Spring 2011)
- Jennifer Bryson, Student Representative (Fall 2010)
- Vijendra Agarwal, Consultant
- Emily Jacobson, Consultant
- Paul Fitts, Consultant

## Graduate Council Committee Members & Consultants

- Tom Krueger, Fall 2010
- Bernadette Taylor
- Vijendra Agarwal
- Carol Angell
- Melissa Bingham
- Margaret Maher
- Jodie Rindt
- Anton Sanderfoot
- Kasilingam Periyasamy
- Glenn Wright
- Robert Krajewski, Spring 2011
- Michelle Stertz, Student Representative
- Katherine Josephson, Student Representative
- Ray Abhold, Consultant
- Chris Bakkum, Consultant
- Charles Martin-Stanley, Consultant
- Bruce May, Consultant

## Presenter Index

U=undergraduate poster; UR=undergraduate oral; G=graduate poster; GRAD=graduate oral;  
E=exhibit

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### **COMMENTS OR SUGGESTIONS?**

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