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April 2, 2013

Cartwright Center

9:00 a.m.-11:30 a.m.

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Dear Friends:

We're pleased that the University of Wisconsin-La Crosse (UW-L) is holding the Graduate Student Research Celebration on April 2, 2013. UW-L takes great pride in providing its 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-L 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 2012 are acknowledged in this publication, and we congratulate all of them.



For this year's event and its focus exclusively on graduate research, I am equally pleased to express my deep appreciation to the members of the Office of Graduate Studies and the Graduate Council for their assistance in planning this publication and the magnificent event.

In addition to today's graduate celebration, UW-L also is hosting this year's National Conference on Undergraduate Research (NCUR) from April 11-13. Here is a second example of UW-L's strong commitment to student research, and I hope that those of you who are participating in today's graduate event can join us again in a week and a half to celebrate the successes of our undergraduate scholars.

In closing, let me congratulate the graduate student scholars and faculty mentors once again for their hard work and dedication leading to the projects included in the 2013 Celebration of Student Research and Creativity.

Best wishes,

Joe Gow, Chancellor

Schedule of Oral Presentations

	330 Cartwright Center	332 Cartwright Center
9:00 to 9:20	Vong Lao <u>Education Professional Development</u> Art and Cultural Identity: A (H)Mong Contribution	Rachel Korb <u>Student Affairs Administration</u> Exploring the Development of Students' Intercultural Competence in Short-Term Study Abroad: A Reflective Approach
9:25 to 9:45	Grant Harrison <u>Human Performance</u> Psychological Skills of Cyclo-Cross Athletes	
9:50 to 10:10	Leah Morgan <u>Biology</u> Hibernating Ground Squirrels: A Novel Model for Repair of Cardiac Ischemic Damage	Trevor Cyphers, Courtney Schneider, and Tisha King-Heiden <u>Biology</u> Bioavailability and Toxicological Assessment of Lead-Contaminated Sediments from Myrick Marsh
10:15 to 10:35	Katee Jo Neumann <u>Student Affairs Administration</u> The Effects of Family Support on UW-L Hmong Student Participation in Study Abroad	Laura Hudson <u>Human Performance</u> The Effect of Exercise-Induced Dehydration on Cognitive Performance on the ImPACT Test in Division III Collegiate Wrestlers

STUDENT ABSTRACTS

GRADUATE POSTER PRESENTATION ABSTRACTS

Poster Session

Valhalla Hall: 9:00 a.m.-11:00 a.m.

Middle School Transition: Will Emotional Intelligence Help Pave the Way?

Lindsey Adams

Advisor: Russell Vaden, School Psychology

Stressful life events are ever-present for early adolescents, but the list of challenges grows longer when students transition from elementary to middle school. The current study sought to determine if aspects of emotional intelligence (EI) can lessen the issues faced by students during their preparation for this transition. A measure of emotional intelligence was used to predict student reports of readiness and confidence for middle school transition. Results indicated that several of the measured dimensions of emotional intelligence appeared to be significant predictors of student confidence for middle school success. From those results, specific recommendations can be offered to educators and school psychology practitioners in order to prepare students for their transition and to support them during that challenging process.

A Physical Activity Program for Individuals with Parkinson's Disease

Karen Aderhold, Carissa Melk, John F. Greany, and Erin Hussey

Advisor: John F. Greany, Physical Therapy

Introduction: Parkinson's Disease (PD) is a nervous system disorder characterized by bradykinesia, hypokinesia, resting tremor, and akinesia. The purpose of this study was to evaluate the effectiveness of a university-based physical activity program with individuals with PD. Methods: Seventeen adults with PD (7 females, 10 males; mean age 74 ± 6.4 years) attended 1 hour sessions, 2 times/week for 13 weeks (mean number of sessions 22.3 ± 3.3). Sessions consisted of aerobic, strengthening, and balance activities supervised by student physical therapists. Pre/post data was collected on all participants in the following domains: mobility, gait and functional strength. Results: There were significant improvements in the TUG score (8.7%), 5x Sit to Stand (decreased 3.3 ± 6.0 sec, $p < 0.05$), and 6 MW (increased 26.9 ± 44.2 m, $p = .025$). There were significant changes in gait (decreased step time) for both extremities. Conclusion: Our results demonstrate the effectiveness of a 13-week individualized exercise program for individuals with PD in some gait parameters and clinical outcomes.

Comparative Reproducibility of Metabolic Anchors Points Using Gas Exchange and the Talk Test

Jaimie Ballweg, Stephanie Haible, Carl Foster, Richard Mikat, Naoko Aminaka, and John Porcari

Advisor: Carl Foster, Clinical Exercise Physiology

Introduction: Studies suggest the Talk Test (TT) is an accurate surrogate of ventilatory (VT) and respiratory compensation (RCT) thresholds. No data are available on the reproducibility of TT. Purpose: Compare respiratory gas exchange (GE) and TT in identifying VT, RCT, maximal power output (PO). Methods: Volunteers (N = 24) performed four incremental (25W + 25W/2 min) cycle ergometer tests. In two tests, GE defined PO at VT, RCT, and maximal effort; in two tests, TT defined PO at VT (equivocal), RCT (negative), max. Results: Significant differences seen between GE/TT for estimating VT (GE: 124W vs. 122W; TT: 154W vs. 153W ($p = .001$)); RCT (GE: 190W vs. 186W; TT: 204W vs. 204W ($p = .002$)). No significant differences between GE/TT for estimating maximal PO (GE: 238W vs. 237W; TT: 243W vs. 241W ($p = .134$)). No significant differences within method: VT (GE: 124W vs. 122W ($p = .780$)); TT: 154W vs. 153W ($p = .788$)), RCT (GE: 190W vs. 186W ($p = .455$)); TT: 204W vs. 204W ($p = .851$)), maximal PO (GE: 238W vs. 237W ($p = .723$)); TT: 243W vs. 241W ($p = .621$)). Conclusions: Estimates (VT, RCT, max) from TT appear to be reproducible within method compared to GE results. As seen in previous findings at low PO, EQ overestimates VT.

2D Knee and 3D Motion Relationships of the Hip and Knee during Bilateral Drop Landing

Haley Bawek

Advisor: Thomas Kernocek, Physical Therapy

Landing mechanics are used to understand ACL injury risk. It is unknown how 2D projection angles of the knee (2D FPPA) relate to 3D hip and knee motions during landing. Purpose: Examine relationships between 2D knee and 3D knee and hip kinematics. Methods: Thirty college-aged females performed five 40 cm landings. Motion analysis system sampling at 240 Hz and force platforms sampling at 2400 Hz were used to obtain data during impact. Data were used to determine 2D FPPA and 3D kinematics of the hip and knee. Correlations were performed between 2D and 3D angles at contact and for excursion. Multiple regressions was used to predict 2D FPPAs for the knee at contact and 2D FPPA excursion from 3D knee and hip kinematic variables. Results: 2D FPPA at contact was related to 3D knee frontal angle at contact ($r=0.82$, $r^2=0.67$). 2D FPPA at contact were predicted by 3D peak knee abduction and peak hip internal rotation angle ($r=0.86$, $r^2=0.74$). 2D FPPA excursion were predicted by 3D hip adduction excursion and knee excursion ($r=0.66$, $r^2=0.44$). Conclusion: Knee frontal plane angles at contact are similar in 2D and 3D kinematics. 2D FPPA excursion is associated with 3D knee abduction and hip adduction.

Early Literacy Skills: Identifying the Predictors of Future Success

Britney Below

Advisor: Jocelyn Newton, School Psychology

Literacy is a key component to developing academic success, and time is critical to determine pre-literacy skills and provide appropriate interventions. The current study will examine the Individual Growth and Development Indicators (IGDIs), as well as demographic risk factors to determine which is the best predictor of kindergarten early literacy skills. Results of this analysis will have implications for how practitioners should design pre-kindergarten screenings.

Dynamic Postural Control Differences between Runners with and without a History of Lower Extremity Injury

Kelly Borden and Megan Aanonsen

Advisor: Stacey Meardon, Physical Therapy

Purpose/Hypothesis: Running for sport and recreation involves controlling progression of the body over a narrow base of support and often results in lower extremity injury. The purpose of this study was to determine if dynamic postural control deficits are associated with lower extremity injury in runners. We hypothesized that runners with a history of lower extremity injury would display reduced postural control during dynamic activity. Number of subjects: 30 runners, 15 with a history of lower extremity injury and 15 non-injured. Materials/Methods: Dynamic postural control was assessed using an anterior-posterior, medial-lateral, and vertical hop test in this ongoing study. For all conditions, participants jumped off of both feet onto a force platform landing on one leg. Ground reaction forces from each trial were exported for analysis and used to calculate the dynamic postural stability index and time to stabilization. Subject data were averaged across condition. Multivariate analysis of variance and Cohen's D effect sizes were used to evaluate group differences. Clinical relevance: It has been suggested that reduced dynamic stability contributes to gait impairments in runners. Knowledge of dynamic stability and postural control in runners with and without injury will enhance our understanding of running injury and potentially guide clinical interventions and rehabilitation.

The Accuracy of the Functional Movement Screen™ to Identify Active Individuals with an Elevated Risk of Musculoskeletal Injury

Josh Bruner, Kirk Krumrei, and Molly Flanagan
Advisor: Chris Durall, Physical Therapy

Purpose: Injuries are somewhat commonplace within highly active populations. One strategy for reducing injuries is to identify individuals with an elevated injury risk prior to participation so that remediative interventions can be provided. Pre-participation screenings have traditionally entailed strength and flexibility measures thought to be indicative of inflated injury risk. One assessment tool used for this purpose is the Functional Movement Screen (FMS™). The FMS™ generates a numeric score based on performance attributes during seven dynamic tasks; this score is purported to reflect future injury risk. For our Critically Appraised Topic (CAT), we chose to ascertain how well the FMS™ can accurately identify highly-active individuals with an elevated risk of injury. Methods/Results: A focused literature review was conducted using pre-determined inclusion and exclusion criteria. Three cohort studies (level 2b evidence) were retrieved and reviewed. Conclusion: All three studies reported that the FMS™ accurately identified individuals within their respective populations who had a higher incidence of future injury. Further studies are needed on other active populations and to determine if the FMS™ is more useful for predicting specific types of injuries.

Postural Control Differences between Runners with and without a History of Lower Extremity Injury

Elizabeth Buhr and Amanda Coilan
Advisor: Stacey Meardon, Physical Therapy

Purpose/Hypothesis: Running requires the ability to control the progression of one's center of mass over a narrow base of support and poses a significant postural control challenge. Due to the high incidence of running injury, understanding factors related to injury is vital. The purpose of this study is to assess postural control in runners with and without history of lower extremity injury. We hypothesized injured runners would have reduced postural control when compared to non-injured runners. Methods: Static postural control was assessed using center of pressure and time to boundary measures during single leg stance (SLS). Fifteen runners with a history of lower extremity injury and 15 non-injured runners performed three 30-second trials of SLS on a force platform with eyes open and eyes closed. Additionally, each subject performed the Star Excursion Balance Test. For this test, each subject stood on one leg and reached with their unsupported limb in three directions (anterior, posterolateral, and posteromedial). Reach distance was recorded for three trials. Group differences were assessed using ANOVA and Cohen's D effect sizes. Clinical relevance: Knowledge of postural control in runners and its relationship to injury has the potential to enhance clinical treatment and rehabilitation of running injuries.

Autism Spectrum Disorder: Regular Education Teachers' Perception of Inclusion

Lauren Byrne
Advisor: Betty DeBoer, School Psychology

According to the Centers for Disease Control and Prevention (2012), one in every 88 children is identified with Autism Spectrum Disorder (ASD). Teachers need to have positive attitudes towards the inclusion of students with ASD in order for their inclusion to be successful. This study examined regular education teachers' attitudes towards inclusion relative to their training on ASD. Teachers also identified barriers and benefits to inclusion. Implications for educators and school psychologists working with students with ASD are discussed.

Plantar Loading Changes with Speed during Barefoot Running with a Rearfoot Strike Pattern

Danielle Cooper
Advisor: Thomas Kernozek, Physical Therapy

Purpose: To determine how speed affects plantar loading in those who naturally rearfoot strike (RFS) when running barefoot. Methods: Fourteen recreational runners (21.80 ± 1.66 years, 170.53 ± 6.98 cm, and 63.77 ± 9.18 kg) performed five barefoot running trials at three different speeds (2.8m/s, 3.3m/s, and 3.8m/s). A Novel emed pedography platform sampling at 239Hz was used to collect barefoot running plantar loading data for eight subareas of the foot. The following dependent variables (DVs) were calculated: peak pressure (PP), pressure time integral (PTI), maximum force (MF), and force time integral (FTI). A repeated measures ANOVA with alpha level of <0.05 was performed for each speed. Results: There were differences in DVs for the different plantar regions between running speeds ($p < 0.05$). As running speed increased, MF and PP increased across the metatarsal regions while the PTI and FTI decreased. Conclusion: Results indicate runners altered loading across the metatarsal regions when running barefoot at greater speeds.

Physiological Responses of Tennis Players to Four Different Methods of Running Repeated 100 Meter Sprints with Varying Number of 180 Degree Changes of Direction

Evan Enquist, Glenn Wright, Scott Doberstein, and Jim White
Advisor: Glenn Wright, Human Performance

The purpose of this investigation is to monitor and compare responses in heart rate (HR), blood lactate (BLa), rate of perceived exertion (RPE), and neuromuscular (NM) fatigue with repeat sprint protocols consisting of four variations of either linear or shuttle sprints. Shuttle sprints include a number of 180 degree changes of direction to accumulate the total distance. Sixteen male collegiate tennis players performed four distinct repeated sprint protocols (six repetitions of 80 m, 90 sec recovery) involving linear or shuttle sprint protocols (1 x 80 m, 2 x 40 m, 4 x 20 m, 8 x 10 m). Countermovement jump (CMJ) height was measured after each sprint to estimate NM fatigue. Best and mean sprint time and jump height, performance decrement (%Dec), and change in BLa, HR, and RPE were determined for each condition. There was a significant %Dec between the linear ($10.2 \pm 0.01\%$) and shuttle sprint times for 4 x 20 m ($4.7 \pm 0.01\%$, $p < 0.01$) and 8 x 10 m ($5.2 \pm 0.01\%$, $p < 0.01$) repeated shuttle sprints. Significant difference was also found for %Dec in CMJ height between 4 x 20 m ($16.2 \pm 0.01\%$) and 8 x 10 m ($20.5 \pm 0.01\%$) repeated shuttle sprints ($p = 0.02$). The present results suggest that linear sprints induce greater fatigue development compared to the shuttle sprints, likely due to the greater running speed.

Acculturation of English Language Learners: Predictor for Academic Success

Mackenzie Ferguson
Advisor: Jocelyn Newton, School Psychology

Hispanic students are the fastest growing population within US schools. This group also tends to experience academic difficulties. Research has shown a relationship between acculturation of English language learners (ELLs) and academic achievement. This study examined how different factors within acculturation (i.e., language usage and social relations) predict academic achievement of elementary, middle, and high school students after controlling for language proficiency. Implications for educators and school psychologists working with ELL students are discussed.

The Impact of RtI Skills and Beliefs on Teacher Efficacy

Anthony Frank
Advisor: Russell Vaden, School Psychology

Teacher efficacy has been related to attitudes towards teaching and openness to new ideas. With increasing implementation of RtI, teacher efficacy requires consideration within the RtI context. Varying levels of teacher RtI-related skills and RtI-related beliefs are examined along with their impact on levels of teacher efficacy. Results and implications to schools implementing RtI will be discussed. Attendees will learn about the implementation of the RtI process and its impact on teacher efficacy.

Cardiorespiratory Energy Requirements during a Firefighter Agility Test

Brienna Fraser, Alethea Hoch, and Natalie Dunn
Advisor: John Greany, Physical Therapy

Introduction: Sudden cardiac death is the leading cause of firefighter fatalities in the country, with approximately 50% occurring during training activities. A national initiative has been established with the aim to decrease sudden cardiac deaths by improving the physical fitness of firefighters. The purpose of this descriptive study was to report the level of cardiorespiratory energy requirements associated with specific firefighter tasks. Methods: Nine male firefighters completed the study (mean age 37.6 ± 7.2 years). This agility test included the following tasks: hose drag, ladder check, dummy drag, balance beam, pike pole, stair climb with weight, sledgehammer, and hose pull. Expired gases and heart rate were collected with the Oxicon Mobile unit. Results: Many tasks within the agility test resulted in near maximal cardiorespiratory workload. Seven of the eight tasks resulted in HR values greater than 90% of HRmax. All firefighters' average VO_2 fell between 65-90% of their VO_2 max. The three activities that resulted in the greatest values were the balance beam, dummy drag, and stairs. Conclusion: This study demonstrates that firefighters experience short bursts of near maximal exertion during job-related situations they commonly encounter. Firefighters would benefit from maintaining high levels of physical fitness throughout their career.

The Effects of Volume of Dynamic Warm-up on Gluteus Medius Muscle Activation and Knee Valgus during Landing and Jump Tasks in Female Collegiate Athletes

Elisabeth Garms, Glenn Wright, and Thomas Kernozek

Advisors: Glenn Wright, Human Performance, and Thomas Kernozek, Physical Therapy

The objectives of this study were to examine the effects of the volume of dynamic warm-up on gluteus medius muscle activation and knee valgus during landing and jump tasks. Twenty female collegiate athletes (age, 19.35 ± 1.31 years) performed three different warm-up conditions: a light volume dynamic warm-up (LDWU), a moderate volume dynamic warm-up (MDWU), and moderate intensity jogging (MJ) in randomized order. Static and dynamic knee valgus and flexion angles, gluteus medius electromyography (EMG), and vertical ground reaction forces (VGRF) were collected pre- and post-warm-up intervention during five hanging drop-landing jumps (HDLJ) from a standardized 40 cm drop height. EMG measurements were normalized to maximum isometric voluntary contraction (MVIC) values. Warm-up intensity was found to average 71.8 ± 10.29 (LDWU), 78.59 ± 7.59 (MDWU), and 70.8 ± 8.85 (MJ) percent of age-predicted heart rate maximum. The current study is ongoing and results in knee kinematics, gluteus medius EMG, and vertical ground reaction force will be forthcoming.

Tibial Stresses in Runners with a History of Stress Fracture

Samantha Gries, Nathan Swan, and Stacey Meardon

Advisor: Stacey Meardon, Physical Therapy

Purpose/Hypothesis: To determine if stress on the tibia was greater in runners with a history of stress fracture. We hypothesized that those with a history of tibial stress fracture would have greater bone stress. Materials/Methods: Pilot data on runners with ($n=12$) and without ($n=12$) a history of stress fracture were collected. Anthropometric and 3D kinetic and kinematic data during running were used to estimate internal forces and moments acting on the tibia using a combination of inverse dynamics and musculoskeletal modeling. Subject-specific bone geometry obtained from plain film imaging was implemented into a hollow elliptical model of the tibia in order to calculate stress at the tibia. Group differences were assessed using a multivariate analysis of variance and effect sizes. Results: The stress fracture group had 24% more compressive stress on the anterior tibia ($p=0.06$, $D=0.92$) and 29% more tensile stress on the posterior modeled tibia ($p=0.05$, $D=0.97$). Minimal differences were observed on the medial and lateral tibia. Conclusion: Bone stress, particularly posterior tensile stress, is elevated in runners with a history of tibial stress fracture. Further research needs to be done to identify gait mechanics associated with elevated bone stress to better guide rehabilitation efforts.

The Physiological Effects of Hiking at Sea Level and Altitude

Jill Gruber

Advisor: Carl Foster, Clinical Exercise Physiology

Purpose: The significance of this project was to determine the physiological responses that occur in apparently healthy individuals when hiking for leisure at altitude. This information was intended to allow for a greater understanding of body responses in leisure hikers to be used as commonplace knowledge for the general public. Design methods: Subjects were required to hike two miles at a 10% grade on three separate occasions, one habituation trial, one hike while breathing sea level air, and one hike while inspiring a gas mixture of 16% O₂. Three separate VO₂ max tests, using the Balke protocol, were also completed by subjects, one habituation trial, one max test while breathing sea level air, and one max test while inspiring a gas mixture of 16% O₂. Results: Significant decreases ($p \leq 0.05$) in oxygen saturation and exercise speed when compared to distance were observed during subject exercise while inspiring the 16% O₂ gas mixture. Heart rate significantly increased ($p \leq 0.05$) during subject exercise while inspiring the 16% O₂ gas mixture. Conclusion: Exercising at 8,000 feet above sea level was associated with statistically significant decreases in oxygen saturation and exercise speed, along with statistically significant increases in heart rate.

Childhood Depression: Impact of Teacher Efficacy and Knowledge on Referral

Myah Houge

Advisor: Russell Vaden, School Psychology

Childhood depression is one of the most common psychiatric disorders with the potential of having negative impacts on students' social, emotional, and academic development. This study examines the degree to which the likelihood of a teacher referring a student for mental health services for depression concerns is related to the combination of teacher efficacy and knowledge of the school-based mental health referral process. Implications for educators and school psychologists will be discussed.

Teacher Motivational Styles: Impact of Teaching Experience and Grade Level

Nicole Howes

Advisor: Rob Dixon, School Psychology

Teacher autonomy-support fosters intrinsic motivation in students, which leads to greater levels of school enjoyment, creativity, academic engagement, and persistence. Student perceptions of teacher autonomy-support and intrinsic motivation decline with age, however the reasons responsible are less well established. This study will address this area by examining the motivational styles of teachers across the elementary, middle, and high school level using the Self-Determination Theory. Implications for educators and school psychologists will be discussed.

Gender Difference in Patellofemoral Joint Stress during Single Leg Jumping

Taylor Huseby, Michael Waller, Matt Winney, and Kayla Gauthier

Advisor: Di-An Hong, Physical Therapy

Previous studies have suggested that females have a higher incidence of patellofemoral pain syndrome (PFPS) than males. Higher patellofemoral joint pressure is a risk factor for developing PFPS. The purpose of this study is to quantify patellofemoral joint stress and identify if there is a difference between males and females during single leg jumping and landing on the dominant leg. Thirty-five participants (M=16; F=19) ranging from 18 to 25 years old completed the study. A 3-D motion analysis system with nine cameras was used to collect kinematic data for each subject over the course of five trials. Two force plates were used to gather ground reaction forces for both the take-off and landing phases of the jumping trials, respectively. V3D software was used to perform inverse dynamic analysis, and a Matlab program, developed in the UW-La Crosse Biomechanics Lab, was used to compute the patellofemoral joint stress throughout the activity. We hypothesize that females will have a higher contact stress at the patellofemoral joint during single leg jumping activities when compared to males.

Influence of Streammacrophytes on Slimy Sculpin (*Cottus Cognatus*) Distribution and In-Stream Food Webs

Jenna Merry

Advisor: Eric Strauss, Biology

Slimy sculpin (*Cottus cognatus*) are small benthic fish that are common inhabitants of the cold-water streams of southwestern Wisconsin. Unpublished data suggests that small-bodied sculpin are more abundant in stream riffles surrounded by open canopy than those surrounded by a closed canopy, which correlates to macrophyte abundance. This research aims to determine whether site differences caused by macrophyte abundance affects the density of the different size classes of sculpin present and whether these differences also affect the structure of local food webs. We hypothesize that at sites where macrophytes are abundant, small-bodied sculpin will be more abundant than large-bodied sculpin, and the sculpin at these sites will also contain a greater mass of food in their guts. Preliminary data contradicts the first part of the hypothesis; however, it appears that the mass contained in sculpin guts is greater at macrophyte abundant sites. We also hypothesize that the food web structure at macrophyte abundant sites will differ from sites lacking macrophytes in regards to the basal nutrient sources, as well as epilithic periphyton biomass and macroinvertebrate community dynamics.

Pharmacokinetics, In Vivo Efficacy, and Toxicity of the Antimicrobial Agent SK-03-92

Rachel Minerath, William Schwan, Jade Finstad, and Kara Klubertanz

Advisor: William Schwan, Biology

Staphylococcus aureus is a major cause of community-acquired and hospital-acquired infections. *S. aureus* strains continue to acquire resistance to common antibiotics. Because antibiotic resistant strains of *S. aureus* are increasing in number, new antibiotics are needed to combat this problem. The novel antimicrobial, SK-03-92, a semi-synthetic drug initially isolated from *Comptonia peregrina* ("sweet fern") is being studied as a potential antimicrobial drug. To develop an antimicrobial, it is necessary to demonstrate efficacy and safety in vivo. Initially, cell cytotoxicity assays were used to determine the toxicity of SK-03-92 using human bladder cells and human kidney cells. The half maximal inhibitory concentrations (IC₅₀) of SK-03-92 revealed cell cytotoxicity at a concentration of 125 µg/ml. Next, a murine thigh abscess model was used to evaluate in vivo efficacy. Results indicated that a single dose at a concentration of 3.2 mg/kg was more effective than more concentrated single doses. Finally, the pharmacokinetic analysis of SK-03-92 is underway to correlate plasma drug concentrations to the in vivo reduction of *S. aureus* to aid in the design of an effective dosing regimen. Producing a safe dosing regimen that demonstrates in vivo efficacy is essential to the development of SK-03-92.

Variability in Plantar Loading during Barefoot Walking at Different Walking Speeds and Sampling Rates

Brett Mueller

Advisor: Thomas Kernozek, Physical Therapy

Background: Pressure platforms are utilized to measure plantar loading in patient populations. Different walking speeds and sampling rates have been used across studies. Purpose: To determine if there were differences in the coefficient of variation (COV) of peak pressure (PP), pressure time integral (PTI), peak force (PF), and force time integral (FTI) for different walking speeds and sampling rates. Methods: PP, PTI, PF, and FTI were measured in seven plantar regions. Twenty-five subjects walked across a 20 m runway and contacted a pressure platform with their right foot. Subjects completed five trials walking at three distinct walking speeds measured with three different sampling rates. Results: Differences in COV were observed between walking speeds for all variables at the first phalanx and first metatarsal head. The largest differences existed between the slowest and fastest walking speeds. Conclusion: Higher walking speeds regardless of sampling rate may result in increased variability in PP, PTI, PF, and FTI for nearly all plantar regions. This must be taken into consideration when comparing plantar loading studies.

Effects of Land Use on Water Quality in Streams of the Driftless Area of the Midwestern U.S.

Rachel Olmanson and Eric Strauss

Advisor: Eric Strauss, Biology

Small streams are important ecosystems that affect the dynamics of downstream ecosystems. However, increased nutrient inputs and changes to land cover have altered the natural functioning of streams. The purpose of our study was to examine the correlation between land cover and nutrients and to examine the seasonal and spatial variation of nutrient concentrations in streams in the Driftless Area of the Midwestern U.S. We hypothesized that streams dominated by agricultural and developed land use would have higher concentrations of nitrogen, dominated by nitrate. We also hypothesized that nutrient concentrations would vary seasonally. During fall 2012 and winter 2013, we sampled 74 streams in the Driftless Area. We found dissolved organic carbon concentrations were variable, ranging from 1.09 to 9.48 mg/L. TDN ranged from 0.16 to 23.70 mg/L, with highest concentrations in agricultural and developed streams and lowest concentrations in forested streams. The TDN pool was dominated by nitrate across all streams. Our results suggest that land cover is correlated with nutrient concentrations and that nitrogen saturation is likely occurring in agricultural and developed streams in the Driftless Area.

The Benefits of Martial Arts in Children with Autism Spectrum Disorder: A Case Study

Andrea Palmer

Advisor: John Greany, Physical Therapy

Introduction: The goal of this case study was to explore the effects of martial arts on physiological and social parameters in a child with Autism Spectrum Disorder (ASD). Methods: A female child with ASD attended martial art sessions for ten weeks. Parameters were collected at baseline, after ten weeks of martial arts, and after a control period of no martial arts. Physiologic parameters were single leg stance (SLS), gait, and postural sway. Social surveys included Social Skills Improvement System (SSIS), Autism Treatment Evaluation Checklist (ATEC), and Clinical Global Impression (CGI). Results: Stride length improved after martial arts training and continued into the control period. There were mixed results for SLS time; the right leg improved after training, while the left did not. However, the left continued to improve during the control period. Postural control (sway) showed improvements after training; however, this was not maintained but regressed to baseline in the absence of training. The sociability subtest of the SSIS - PF and of the ATEC showed improvement in martial arts; improvements were not maintained in the control period. Conclusion: Martial arts training demonstrated an improvement in sociability for this child with ASD that was not maintained after the control period.

Preschoolers' Early Literacy: Are Social Skills Related to Reading?

Brynn Parker and Jocelyn Newton

Advisor: Jocelyn Newton, School Psychology

Early literacy skills are related to later reading outcomes and overall reading achievement. Poor social skills are a risk factor for low academic achievement. This study explores the extent that learning-related social skills relate to early literacy skills in preschool, as well as the extent to which specific learning-related social skills relate to overall literacy. Implications for school psychologists in promoting and supporting positive student outcomes in preschool are discussed.

Anthropometric, Kinetic and Kinematic Variables Related to Tibial Bone Stresses during Running

Maria Peloquin and Derek Scheevel

Advisor: Stacey Meardon, Physical Therapy

Purpose/Hypothesis: Tibial stress fractures [TSF] likely result from elevated bone stresses, which can be estimated using musculoskeletal modeling. The purpose of this study was to identify key gait mechanics and bone geometric parameters that result in elevated bone stress in runners with a history of TSF. Materials/Methods: In this ongoing study, 24 runners (12 with TSF, 12 controls; 23.89 ± 5.25 years, 1.79 ± 0.40 m, 62.76 ± 9.19 kg) ran between 3.7 m/s $\pm 5\%$ over a force platform while 3-D motion data were collected. Peak bone stresses at four sites of the tibia were estimated. Linear regression was used to identify key correlates of bone stresses predictive of group membership previously determined with logistic regression. Results: Posterior surface tensile stress (PSTS) alone predicted group membership (TSF vs. no TSF) 65% of the time. Variables that best predicted PSTS were cross sectional area, medial-lateral moment of inertia, peak absolute free moment, and peak rearfoot eversion during stance phase of running ($R^2=0.582$). Conclusion: PSTS exhibited a moderately good ability to differentiate between those with and without a history of SF. A combination of bone geometry and gait biomechanics best predicted bone stress related to TSF. To prevent and treat TSF, clinicians should consider not only bone properties but also underlying running biomechanics.

The Grandad Running Time Trial

Travis Pernsteiner

Advisor: Jin Chung, Recreation Management

The City of La Crosse possesses a prime landscape for adventure. Surrounded by two natural wonders, the mighty Mississippi and the majestic bluffs, La Crosse is a hub for outdoor enthusiasts. With an extremely active community, establishing a new outdoor event will provide a unique opportunity for those who wish to challenge themselves. The event is a Running Time Trial up Grandad Bluff, a completely new and original event for this area. The race will be an event within the Festival Foods Grandad Half Marathon, organized by the City of La Crosse Park and Recreation Department. The Running Time Trial will traverse Bliss Road, climbing 500 feet in just 1.5 miles, and welcome anyone who wishes to 'Conquer the Bluff.'

Acoustic Analysis as a Surrogate for Gas Exchange to Obtain Metabolic Threshold Measurements

Amanda Peterson, Carl Foster, Nirinjan Yee, Charalampos Stamatopolous, and Panos Giotis

Advisors: Carl Foster and John Porcari, Clinical Exercise Physiology

Measurement of ventilatory (VT) and respiratory compensation (RCT) threshold is a standard practice during exercise testing with measurement of respiratory gas exchange (RGE). Previous work suggested the feasibility that a conceptually simple breath sound analysis (BSA) technique might be an alternative to direct RGE. Purpose: This study extends observations of the relationship between VT & RCT detection using RGE and BSA. Methods: Healthy subjects ($N=34$) performed incremental, maximal cycle ergometer exercise ($25W + 25W$ per 2 min.). RGE was performed using open circuit spirometry with VT & RCT determined from v-slope and ventilatory equivalents. BSA was performed using proprietary software from a microphone in the breathing valve, and included measurements of respiratory rate and sound intensity (the product of tidal volume/inspiratory and expiratory time). Results: There was a significant relationship between the power output at both VT ($R^2=0.63$) and RCT ($R^2=0.80$) and the combination of VT and RCT ($R^2=0.77$) between the REG and BSA, with the best fit line basically equivalent to the line of identity. Conclusions: The conceptually simple BRA appears to be a viable surrogate for direct measurement of VT and RCT using RGE.

The Relationship between Persistence and Student Engagement in Youth

Laura Rapp

Advisor: Jocelyn Newton, School Psychology

Persistence has been identified as a positive intellectual trait that helps people succeed during difficult situations. Research has demonstrated the importance of persistence in tasks spanning long periods of time, especially in academic endeavors. Therefore, this study will examine how six factors of student engagement predict the positive trait of persistence. The implications of this study will suggest potential points of invention to bolster persistence in school-aged youth.

Quantifying Variation in Recruitment of Freshwater Mussels, and Exploring Possible Relations with Hydrologic Events

Patricia Ries, Steve Zigler, and Mike Davis

Advisors: Roger Haro, Biology, and Teresa Newton, Upper Midwest Environmental Sciences Center

Overall abundance of native mussels has substantially declined in the Upper Mississippi River (UMR). One potential reason for this decline is the lack or slowing of recruitment; however, minimal research on recruitment is available. Our objective was to estimate the inter-annual variability in recruitment of mussels and explore the potential role of discharge. We used a quantitative dataset with four years of population data on a mussel assemblage in the UMR. Two methods, direct assessment and catch-curve analysis, were performed to assess recruitment in the three most dominant tribes (phylogenetic grouping) of mussels. Direct assessment revealed an almost 50% reduction in mussel densities – a result primarily due to little recruitment. The catch-curve analysis provided evidence of strong and/or weak year-classes, which appeared to have a relationship with discharge. For instance, the tribe *Lampsilini* typically yielded strong year-classes when higher than average discharge occurred during June to July, and weak year-classes when discharge during this time was below average. This research aims to determine if variations in recruitment are a useful measure of population health in mussel assemblages.

The Benefits of Martial Arts in a Child with Autism Spectrum Disorder: A Case Study

Samantha Runde, John Greany, and Kris Greany

Advisor: John Greany, Physical Therapy

Introduction: The goal of this study was to observe effects of martial arts on physiological and social domains in a child with Autism Spectrum Disorder (ASD). Methods: The child attended martial arts sessions for ten weeks. The child was assessed at baseline, after ten weeks of martial arts, and after ten weeks of a control period without martial arts. Physiological measures collected were balance, gait, and postural sway. The child's parents completed behavioral surveys at each phase. Results: Postural sway improved with martial arts and continued to improve slightly at the conclusion of the control period. Single leg stance greatly improved on both legs after training; however, results were not sustained during the control period. The sociability subtest score of the ATEC showed an improvement after martial arts, and the SSIS-PF demonstrated improvements in the communication subscale score; both changes were maintained after the control period. Moderate improvements were noted with gross motor skills on the CGI after ten weeks of training; however, ratings returned to baseline after the control period. Conclusion: Martial arts training resulted in a trend toward improved physiological and behavioral measures in this child; however, most behavioral measures regressed after the cessation of martial arts.

Classroom Management: Does Teacher Efficacy and Experience Matter?

Julia Salzman

Advisor: Betty DeBoer, School Psychology

Classroom management is a major reason cited for leaving the teaching profession. This study will examine the differences in the use of evidence-based classroom management strategies, specifically those of STOIC, among teachers who are either novice or experienced and who report either high or low self-efficacy in classroom management. Implications for school psychologists in working with teachers to support classroom management development will be discussed.

Walk Strong – Walk Tall: A New Fall Prevention Program

MiKayla Sanocki

Advisor: John Greany, Physical Therapy

Introduction: Falls are the most common cause of non-fatal injuries for older adults in the United States. The purpose of this study was to determine if the Walk Strong – Walk Tall Fall Prevention program decreases falls' risks and future falls. Methods: Fifty-three participants from the region volunteered to participate (mean age 78.0 ± 10.1 years; 39 females & 14 males). Participants met weekly to review fall risk topics and participate in balance exercises for five to six weeks. Gait speed and the Activities-Specific Balance Confidence (ABC) scale were collected at the beginning and conclusion of the program. A telephone follow-up call was performed at three to six months post-program to evaluate fall rates. Results: Twenty-five participants fell in the previous year (46.3%); of those who fell, 12 sustained injuries (48%). There was a significant change in gait speed at the conclusion of the program (0.13 ± 0.19 m/s; $p < .05$). There was no difference in perceived balance confidence at the conclusion of the program. Two of 27 responding participants fell during the three to six month follow-up (7.4%); one sustained an injury (3.7%). Conclusions: These early data appear to be improving at least one risk factor of gait mobility and potential reduction in prospective falls.

2D and 3D Relationships between Knee and Hip Kinematic Motion Analysis: Single Leg Drop Landings

Bryan Sorensen, Thomas Kernozek, John Willson, and Robert Ragan

Advisor: Thomas Kernozek, Physical Therapy

Kinematics of the knee is a common focus in injury-related research. Purpose: To quantify the relationship between 2D and 3D hip and knee kinematics in single leg drop landings. Methods: Thirty-one females (19-24 years) performed five 40 cm single leg landings during motion capture at 240 Hz. Multiple regressions were used to predict relationships for knee and hip between 2D frontal plane projection angles (FPPA) and 3D measurements. Results: 2D knee FPPA IC was predicted by knee 3D frontal plane angle IC and 3D knee flexion angle IC ($r^2=.759$). Correlations between 2D valgus/varus excursions were poorly correlated with 3D knee and hip excursion kinematics ($r < .4$). Conclusion: 2D FPPA of the knee at IC correlated well with 3D knee frontal plane kinematics at IC. There were very weak correlations between 2D valgus/varus excursion and 3D kinematics of the knee and hip. During single leg drop landings, 2D and 3D variables have stronger relationships for knee at IC as compared to knee excursion.

Assessing School Psychologists' Knowledge of Child Sexual Abuse

Melannie Tate and Betty DeBoer

Advisor: Betty DeBoer, School Psychology

Child sexual abuse (CSA) is a prevalent yet understudied issue, affecting an estimated one in sixteen children nationally. With expertise in mental health, school psychologists are in a unique position to serve CSA victims, and yet their knowledge of the issue may vary considerably. Assessing this knowledge is critical for informing future prevention and intervention efforts in schools. The current study examines school psychologists' knowledge of CSA as a function of their level of experience.

The Development of an Anaerobic Sprint Running Test Using a Non-Motorized Treadmill

Trisha VanDusseldorp, Clayton Camic, and Glenn Brice

Advisor: Glenn Wright, Human Performance

The purpose of this study was to determine the test-retest reliability of a newly developed anaerobic sprint running test (ASRT) on a non-motorized treadmill (NMT) that assesses anaerobic power and anaerobic capacity. Twenty-six college male athletes (20.2 ± 2.1 years; 181.3 ± 6.5 cm; 79.04 ± 9.3 kg) performed three separate trials separated by a minimum of 72 hours of a 25-second maximal effort sprint on a NMT against a workload set to 18% of their individual body mass. Anaerobic power was determined by peak power output (PP), and anaerobic capacity was determined by mean power output (MP) during the test. Blood lactate response was also determined. Test-retest reliability was assessed by interclass correlation coefficient (ICC) and coefficient of variation (CV%). Results indicate no significant differences between the three trials for PP ($T1=2,360 \pm 547$ W, $T2=2,250 \pm 462$ W, $T3=2,325 \pm 524$ W; $p=0.15$) or MP ($T1=1,648 \pm 294$ W, $T2=1,612 \pm 286$ W, $T3=1,666 \pm 316$ W; $p=0.26$) Reliability between the three trials for PP (ICC: $r=0.94$, CV: 7%) and MP (ICC: $r=0.94$, CV: 6%) were considered strong. Lactate responses (ΔLa) were not significantly different between trial two and three ($p=.226$; $T2: \Delta La=11.61 \pm 1.8$ mmol/L, $T3: \Delta La=11.0 \pm 2.5$ mmol/L). The results indicate the ASRT is reliable for assessing PP and MPO in highly motivated subjects.

The Relationship between Center of Gravity Projection Angle/Distance and Knee Kinematics during Cutting

Charles Nathan Vannatta

Advisor: Thomas Kernozek, Physical Therapy

Cutting tasks have been reported as an activity associated with increased incidence of non-contact anterior cruciate ligament (ACL) injury. Recent studies have implicated trunk position as a possible contributor to increasing the external moments in cutting. Trunk position may impact the location of subjects' center of gravity (COG) and its projected change in angle or distance from the plant foot during the cut. Purpose: To investigate relationships between athletes' COG projection angle/distance during a predetermined cutting task and knee kinematics and kinetics. Methods: Twenty collegiate soccer players performed a cutting task using their dominant leg on a force plate while 3D motion analysis was conducted. The relationships between the COG projection angle/distance and knee kinetic and kinematic variables and the gender differences in COG angle/distance and knee kinematics and kinetics were determined. Results: COG projection angle was related to knee biomechanics in the frontal and transverse planes. Normalized COG distance was related to maximum knee internal rotation angle and transverse plane excursion. Conclusion: Large anticipated changes in COG projection angle do not appear to be related to knee biomechanics in a manner consistent with mechanisms of ACL injury in healthy athletes.

Student Engagement in High School: Impacts of Teacher Support

Karisa Weske

Advisor: Robert Dixon, School Psychology

Teachers are instrumental in facilitating a student's relationships with the school community. By offering various types of support, teachers may positively impact the cognitive and psychological engagement of high school students. The current study examined which aspects of teacher support—as perceived by students—are predictive of school engagement. Implications for school psychologists are discussed regarding enhancing student engagement, focusing consultation services, and impacting school improvement plans.

Can the Talk Test Be Used to Control Exercise Intensity?

Michaela Woltmann

Advisors: Carl Foster, Clayton Camic, Richard P. Mikat, and John P. Porcari, Clinical Exercise Physiology

Introduction: The Talk Test has been shown to be an effective surrogate of standard methods of prescribing exercise training intensity and is responsive to manipulations known to change physiologic function. It is not known if the Talk Test can be used as a control tool for regulating training intensity. **Methods:** Physically active volunteers (n=16) performed an incremental exercise test to identify stages of the Talk Test (LP-1, LP, EQ, NEG). In subsequent, randomly ordered, 30 minute steady state runs, the running velocity was regulated by 'clamping' the TT stage desired, and conventional markers of exercise intensity (heart rate, blood lactate, rating of perceived exertion) were monitored. **Results:** All subjects could complete the LP-1 and LP states, with 13 and two subjects able to complete the EQ and NEG stages, respectively. Physiologic responses were broadly within those predicted from the incremental exercise test and within the range of physiologic responses appropriate for exercise training. The LP-1 and LP stages generally produced intensities compatible with training intensity in healthy adults, and the EQ and NEG stages produced intensities compatible with training in athletes. **Conclusion:** The Talk Test can be used simply to control exercise training intensity.

ORAL PRESENTATION ABSTRACTS

Bioavailability and Toxicological Assessment of Lead-Contaminated Sediments from Myrick Marsh

Trevor Cyphers and Courtney Schneider, and Tisha King-Heiden

Advisor: Tisha King-Heiden, Biology

The La Crosse, Wisconsin, Gun Club maintained a trapshooting range at the site of the La Crosse River Marsh (Myrick Marsh) for three decades (1932-1963), resulting in lead (Pb)-contaminated sediments. Since Pb causes physical deformities, behavioral changes, and reproductive dysfunctions in humans and wildlife, it is essential that we determine the potential bioavailability and risk to wildlife and humans. To determine whether or not Pb is bioavailable, we sampled several fish species from a variety of trophic levels at reference sites (0 ppm), and areas with low (200-1000 ppm), medium (1,000 - 4,000 ppm), and high (4,000 – 8,000 ppm) Pb-contaminated surface sediments. Initial findings suggest Pb from contaminated sites to be bioavailable, as we detected Pb levels as high as 6 ppm in fish samples. Findings also suggest a correlation between Pb levels within fish samples and Pb levels from contaminated surface sediments. In addition to field studies, laboratory toxicity assays using zebrafish larvae are being conducted to determine if Pb-contaminated surface sediments from Myrick Marsh pose toxicological risk under varying Pb concentrations. Determining the bioavailability and toxicity of the Pb-contaminated sediments within the marsh should provide the necessary framework for determining whether remediation and/or long-term monitoring is required.

Psychological Skills of Cyclo-Cross Athletes

Grant Harrison

Advisors: Glenn Wright, Teresa Hepler, and Richard Mikat, Human Performance

Psychological skills of athletes seem to have strong ties with peak performance in many different athletes. Past research has identified many different key psychological skills that contribute to a person's performance, such as attitude, self-confidence, concentration, focus, determination, and commitment (Krane & Williams, 2006). Though there is research in the field linking psychological skill to performance in high intensity endurance athletes, to date there is no known research relating the psychological skills to the performance of Cyclo-cross athletes. Cyclo-cross, like other disciplines of cycling, seems to require a high level of physical and mental skill. In that regard, the purpose of this study was to compare the psychological skills of Cyclo-cross athletes, who compete at very high intensities, to their performance in a major event (USACycling Cyclo-cross National Championships in Madison, WI, in 2013). An additional aim of this study was to attempt to identify what role coaching may have in facilitating the development of psychological skills in the same athletes. To gauge psychological skill, athletes (n = 124, male = 92, female = 32) completed the Athletic Coping Skills Inventory-28 (ASCI-28). An athlete's placing in their highest priority race was used to measure performance. Both psychological skill and performance data were collected across different skill levels of competitors competing in different races. Through the survey, athletes also reported their commitment to training, commitment to the event, and the involvement of coaching in their development.

The Effect of Exercise-Induced Dehydration on Cognitive Performance on the ImPACT Test in Division III Collegiate Wrestlers

Laura Hudson

Advisor: Glenn Wright, Human Performance

The purpose of this study was to determine whether moderate exercise-induced dehydration has a negative effect on cognitive performance on the ImPACT (Immediate Post-Concussion Assessment and Cognitive Testing) test in Division III collegiate wrestlers. Twenty-one NCAA Division III wrestlers representative of all ten collegiate weight classes participated in the study. Subjects completed the computer-based ImPACT under euhydrated conditions and immediately following, a standard wrestling practice to induce moderate dehydration (2.5-4% body weight loss). Pre-participation euhydration status was confirmed using urine specific gravity, hematocrit, and body weight measurements of subjects. Percent body weight loss (% Wt loss) was determined as the difference between pre- and post-practice body weight. ImPACT test responses and scores were compared between euhydrated and dehydrated conditions to determine if a significant decrease in specific cognitive performance variables had occurred. Paired t-tests were used to determine significance ($p < 0.05$) between conditions. Results indicate significant weight loss ($-2.9 \pm 0.4\%$, $p < 0.05$) took place, indicating moderate dehydration status. Significant decreases in the visual memory, visual motor, and impulse control variables of the ImPACT were observed after dehydration. The results of this study indicated that moderate exercise-induced dehydration may negatively affect the interpretation of the diagnostic modules within the ImPACT test.

Exploring the Development of Students' Intercultural Competence in Short-Term Study Abroad: A Reflective Approach

Rachel Korb

Advisor: Jorg Vianden, Student Affairs Administration

This project is an originally designed and conducted qualitative study that explored students' intercultural competence development in short-term study abroad programs. The research required a four-week stay at a study abroad location in Seville, Spain, during summer 2012 for data collection. Through in-depth focus groups and analytical journal entries, the project explored the process of intercultural competence development and how to intentionally design study abroad programs to better foster that development in a short period of time (one to six weeks). The study utilized cultural immersion activities in conjunction with a critical reflection approach in an attempt to illustrate a more efficient manner to gain intercultural competence.

Art and Cultural Identity: A (H)Mong Contribution

Vong Lao

Advisors: Carol Angell, Educational Studies, and Donald Sloan, Art

This project is connected to the Hmong children's book *Metal Hawk in the Sky*, recently written by UW-La Crosse staff members Maggie McHugh and Dr. Bee Lo. The story follows a young Hmong boy who is torn between staying a child and becoming the father figure of the house because his father is away fighting the Vietnam War. The purpose for this research is the documentation and creation of artistic illustrations designed to promote a culturally and historically accurate portrayal of the Hmong people, their culture, and their role in the Vietnam War. As the needed illustrations will include images of Hmong homes, daily activities, and landscapes of Laos, travel to Laos is pivotal for the success of this project. Through these illustrations in the book, which is to be published by Universal Human Publishing, both the La Crosse and greater community can share and experience a culture that is different from their own as well as help Hmong students develop their cultural identity. It is believed that this project will serve numerous populations once it has been created and disseminated. Students and teachers will have the opportunity to share these research findings and illustrations together in the classroom. Parents and students will have the opportunity to discuss cultural differences through these illustrations. Overall, the results created from the project will raise cultural awareness and promote identity development, specifically in multicultural education. The methodology includes engaging in historical research in Laos about the Vietnam War era through interviews with elders, text, and photographs; And creating culturally accurate illustrations to be included in the published children's literature book, *Metal Hawk in the Sky*.

Hibernating Ground Squirrels: A Novel Model for Repair of Cardiac Ischemic Damage

Leah Morgan

Advisor: Scott Cooper, Biology

To study hypoxia, ischemia, decreased metabolic demand, and muscle atrophy, many researchers have turned to studying small, hibernating mammals such as the 13-lined ground squirrel (*Ictodomys tridecemlineatus*). During hibernation, a 13-lined ground squirrel's heart rate slows from 200–400 beats per minute to two to ten beats per minute, body temperature drops from 37 °C to 4–6 °C, and oxygen consumption drops by 98%. This reduced blood flow makes hibernating ground squirrels prone to lethal clot formation. We have looked for evidence of heart damage and ischemic markers in histological sections of hibernating and non-hibernating hearts. Ischemic markers include hypereosinophilia, noncontractile ischemic myocytes that are stretched (wavy fibers), and contraction band necrosis. Our results have shown evidence of significant damage in the hearts of hibernating ground squirrels, which is resolved when the animal returns to a non-hibernating state.

The Effects of Family Support on UW-L Hmong Student Participation in Study Abroad

Katee Jo Neumann

Advisor: Larry Ringgenberg, Student Affairs Administration

Many rooted institutional and cultural factors prevent students of color from studying abroad, including finances, family and work responsibilities, fear of racism and discrimination, and safety concerns. As recent immigrants to the United States, the Hmong hold strong familial and educational values which resonate in many aspects of their lives. This study analyzes the factors which influence Hmong students' consideration to study abroad in regards to their family interdependence and value placed on education. Using a quantitative approach, approximately 200 UW-L Hmong students were surveyed to determine how one's family's opinion of whether or not study abroad is an educational enhancement affects one's consideration to study abroad. Students were separated into two groups: those with and without family support. Descriptive cross-tabulation results show that both groups view cost, family obligations, and

safety as obstacles to participating in study abroad, while exploring cultural roots is a strong factor in their decision whether or not to participate. Results will be used by UW-L study abroad advisors to better understand Hmong students and their concerns, help provide more sensitive and informative advising, and organize and promote new study abroad programs that will match their needs.

**2012 RECIPIENTS OF THE GRADUATE RESEARCH, SERVICE AND
EDUCATIONAL LEADERSHIP AWARDS**

Student's Name	Department	Faculty Sponsor	Title
Aliberkys Lopez	Microbiology	Mike Hoffman	<i>Identification of Cellular Proteins that Have a Role in Human Parainfluenza Virus Type 3 Assembly and Release</i>
Amanda Peterson	Exercise & Sport Science	Carl Foster	<i>Acoustic Analysis as a Surrogate for Gas Exchange to Obtain Metabolic Threshold Measurements</i>
Amy Burns	Therapeutic Recreation	Susan Murray	<i>Designing and Implementing a Rifle Shooting Clinic for Adults with Physical Disabilities</i>
Amy Schmied	Recreation Management	Patricia Ardovino	<i>A Comprehensive Guide to Adventure Cycling in Austria (Including Trails, Maps, Itineraries, Ratings, Photos, Camping Information, Hotel Information, Accessibility and Much More)</i>
Andrew Hart	Biology	Tom Volk	<i>Identification and Analysis of Cryptic Fungal Species of North American <i>Trametes versicolor</i> Using DNA Sequencing, Mating Tests, and Laccase Efficacy</i>
Annalise Doyle	Therapeutic Recreation	Susan Murray	<i>Designing and Implementing a Zumba Gold® Fitness Program for Women in Transition from Jail and Homelessness</i>
Bayan Shaheen	Microbiology	Bernadette Taylor	<i>Development of Monoclonal Antibodies to Determine Sites of Leukocyte Retention in Hibernating Thirteen-Lined Ground Squirrels (<i>Ictidomys tridecemlineatus</i>)</i>
Brittany Brown	Clinical Microbiology	Greg Sandland	<i>Multi-Species Interactions between Intestinal Bacteria, their Host, <i>Biomphalaria glabrata</i>, and the Parasite <i>Echinostoma caproni</i></i>
Elisabeth Garms	Health Professions-Physical Therapy	Tom Kernozek	<i>The Effects of Volume of Dynamic Warm-Up on Lower Extremity Muscle Activation, Proprioception, and Performance of Division III Collegiate Female Athletes</i>
Evan Enquist	Exercise & Sport Science	Glenn Wright	<i>Tennis Player 100 Meter Sprint Performance</i>
Grant Harrison	Exercise & Sport Science	Glenn Wright	<i>Validation of New Technology in Cycling and Laboratory Testing</i>
Jacob Geitman	Biology	Nicholas Downey	<i>An Investigation of a Leucine-Rich Repeat Protein in <i>Trypanosoma brucei</i></i>
Jaimie Ballweg	Exercise & Sport Science	Carl Foster	<i>Reproducibility of Individual Physiological Responses to the Talk Test in Comparison to Responses from Conventional Exercise Tests Variables</i>
Jenea (Heimes) Sweeter	Microbiology	Bernadette Taylor	<i>Human IgE Antibody Response to Low-Dose Intradermal Versus Standard Dose Intramuscular Influenza Vaccination</i>
Jenna Merry	Biology	Eric Strauss	<i>Role of Macrophytes in Food Web Dynamics of Slimy Sculpin (<i>Cottus cognatus</i>) in a Cold-Water Stream in Western Wisconsin</i>

Jill Gruber	Exercise & Sport Science	Carl Foster	<i>The Physiological Responses to Hiking at Sea Level and Altitude</i>
Josephine Greve	Microbiology	Jay Ellingson, SN Rajagopal	<i>Proof of Concept for Simultaneous Detection of Enterohemorrhagic Escherichia coli (EHEC) Serogroups without Enrichment and in Eight Hours by Real-Time PCR</i>
Katee Jo Neumann	Student Affairs Administration	Jorg Vianden	<i>Southeast Asia Heritage Tour: A Sustainable Study Abroad Experience to Increase Hmong Representation</i>
Laura Hudson	Exercise & Sport Science	Glenn Wright	<i>The Effect of Moderate Exercise Induced Dehydration on Cognitive Performance on the ImPACT Concussion Test in Collegiate Wrestlers</i>
Leah Morgan	Biology	Scott Cooper	<i>Effect of Hibernation on Cardiac Ischemic Markers and Fibrinolysis Metabolites</i>
Lindsey Adams	Psychology	Russell Vaden	<i>Middle School Transition: Does Emotional Intelligence Help Pave the Way?</i>
Megan Aanonsen, Kelly Borden, Elizabeth Buhr, Amanda Coilan	Physical Therapy	Stacey Meardon	<i>Dynamic Postural Control and Running Injury</i>
Michael Merriman	Biology	Meredith Thomsen	<i>Testing a Restoration Strategy for the Upper Mississippi River Floodplain Forest</i>
Michaela Woltmann	Exercise & Sport Science	Carl Foster	<i>Can the Talk Test Be Used to Control Exercise Intensity?</i>
Natalie Magnus	Student Affairs Administration	Darlene Lake	<i>Social Justice Curriculum for International Service-Learning Programs</i>
Nathan Olson	Physical Therapy	Tom Kernozek	<i>Patellofemoral Joint Stress with Three Squat Techniques in Females with Patellofemoral Contact Area from Healthy and Individuals with Patellofemoral Pain</i>
Rachel Korb	Student Affairs Administration	Jorg Vianden	<i>Exploring the Development of Students' Intercultural Competence in Short-Term Study Abroad Programs: A Reflective Approach</i>
Rachel Minerath	Microbiology	William Schwan	<i>Pharmacokinetic Analysis and In Vivo Efficacy of SK-03-92 against Staphylococcus aureus Infections</i>
Rachel Olmanson	Biology	Eric Strauss	<i>Temporal and Spatial Patterns of Nutrients in Coon Creek, a Cold-Water Stream in Western Wisconsin</i>
Robert Mooney	Biology	Eric Strauss	<i>Glossosoma intermedium Case Periphyton as a Nutritionally Beneficial Resource for lotic Grazing Communities</i>
Theresa Simpson	Biology	Meredith Thomsen	<i>The Impact of Depredation Controls and Harvest Management on Wisconsin's Central Forest Wolf Packs</i>
Trevor Cyphers	Biology	Tisha King-Heiden	<i>Bioavailability and Toxicological Assessment of Lead-Contaminated Sediments in an Urban Riverine Marsh</i>
Trisha VanDusseldorp	Exercise & Sport Science	Glenn Wright	<i>Force Treadmill Anaerobic Test</i>
Xiong Yang	Biology	Margaret Maher	<i>Dietary Fatty Acid Regulation of a Metabolic Switch in Thirteen-Lined Ground Squirrels</i>

CONGRATULATIONS, GRADUATE STUDENTS!

2012 Celebration of Student Research and Creativity Graduate Award

Recipients:

Megan Pulvermacher and Ericka Grimm - School Psychology

Mentor: Betty DeBoer

Teacher Understanding of Mental Health and Implications for School Psychology

Kathryn McElroy, Eric Ellis, Amanda John, and Ryan Sharpee - Health Professions

Mentors: John Willson, Thomas Kernozek, and Di-An Hong

Effects of Step Length on Patellofemoral Joint Stress in Female Runners with Patellofemoral Pain

Thomas Almonroeder, Bryan DeJarlais, Andrew Laack, and Isaac Wouters - Health Professions

Mentors: John Willson and Thomas Kernozek

The Effect of Step Length on Patellofemoral Stress in Healthy Female Runners

Zachary Koepke, Brian Peterson, and Whitney Gnewikow - Health Professions

Mentor: Thomas Kernozek

Patellofemoral Stresses in Males and Females during Weight-Bearing Squat Techniques

2012 Graduate Thesis Award Recipient:

Leslie Svacina – Master of Science in Education in Student Affairs Administration

Mentor: Larry Ringgenberg

From Internship to Classroom: A Study of Academic Self-Efficacy

2012 Graduate Academic Achievement Award Recipients:

Alexandra Price – Master of Science in Community Health Education

Program Director: Gary Gilmore

Katie Bauer – Master of Science in Biology

Program Director: Mike Hoffman

Richard Anderson – Master of Science in Education in Student Affairs Administration

Program Director: Jodie Rindt

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ABSTRACT BOOK EDITORS

ANNALISE DOYLE
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COMMENTS OR SUGGESTIONS?

We welcome your comments and suggestions about the celebration. Please send them to gradstudies@uwlax.edu.