Graduate Research Symposium

7:30-9:30 AM
May 1
Cleary Center

2026

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GRADUATE STUDENT ABSTRACTS

GRADUATE POSTER PRESENTATION ABSTRACTS

Session A
7:30 am-8:25 am

A.1 Platelet Resistance to Cold Storage in Ground Squirrels and the Application in Humans

Kyrie Mittelstadt
Mentor: Scott Cooper, Biology

Ground squirrel platelets are resistant to storage in the cold, unlike human platelets which must be stored at room temperature. This is important so we can study the mechaanisms that allow the squirrel platelets to survive. We then can apply these potential mechanisms to store human platelets in cold conditions, reducing the amount of wasted blood products. Recently there was a platelet phosphoproteome experiment performed, identifying all of the proteins that are phosphorylated in non-hibernating and hibernating platelets. By analyzing the dataset we will identify candidate proteins in ground squirrel platelets that allow the platelets to survive cold temperatures. The pathways these candidate proteins are involved in will be assayed to see if there are differences between human and ground squirrel platelets stored at room temperature or in the cold. The ultimate goal is to alter these pathways in human platelets to determine if the platelets are then more resistant to cold storage. If they are more/less resistant we will be able to help determine what factors go into allowing human platelets to be stored in the cold, and potential problems with using these proteins to allow for cold storage resistance.

A.2 Objective Metrics of Inflammation in Surgical Wounds of the Domestic Cat (*Felis catus*)

Adam Aker
Mentors: Anita Davelos and Faye Ellis, Biology

Veterinary research on wound healing rates often employs subjective visual inflammation scores to assess the magnitude of inflammation and differences in treatment outcomes. No standardized data exist to assess postoperative wound health in animal patients. Current objective measures of inflammation, such as blood tests, are not specific to the wound site, nor do they control for unrelated inflammatory sources.This study focused on evaluating physiologic variables that correlate with signs of inflammation, to assess their usability in monitoring wound healing rates of the domestic cat (*Felis catus*). The specific variables measured were redness, skin hydration, elasticity, and sebum production. Feline subjects were evaluated in collaboration with the Coulee Region Humane Society using Courage and Khazaka dermatologic instruments and imaging software to obtain quantitative measurements. Variables were assessed preoperatively and immediately postoperatively. Significant changes were observed in skin elasticity and sebum production following surgery, whereas redness and skin hydration showed no significant change. These results suggest that functional and physiological changes in the skin may provide earlier and more sensitive indicators of inflammatory response than the visual assessments historically relied upon. With an objective measurement parameter, a higher standard could be implemented in how veterinary research assesses wound management strategies.

A.3 Competitive Feeding Interactions of Mottled Sculpin and Slimy Sculpin

Evan Sirianni
Mentors: David Schumann and Jason Freund, Biology

Mottled Sculpin (*Cottus bairdii*) and Slimy Sculpin (*C. cognatus*) are benthic invertivores that often occur within the same watersheds throughout the Wisconsin Driftless Area, yet they rarely cooccur within streams. To examine whether competitive feeding interactions contribute to this segregation, I quantified aggressive acts (i.e., chases and nips) and food (i.e., *Gammarus* sp.) consumed during 20-minute timed trials. Trials were categorized by species and size class, and each trial type included 10 replicates plus two foodless control trials. Adult sculpin accounted for 84% of all aggressive acts. Intraspecific Mottled Sculpin trials had the most aggression (Kruskal-Wallis rank sum test, $p < 0.01$), particularly during adult only trials (Kruskal-Wallis rank sum test, $p = 0.07$). Slimy Sculpin accounted for 81% of all amphipods consumed and on average ate 1.7 (SD = 2.1) more amphipods than Mottled Sculpin during interspecific trials. Aggression did not differ between food and foodless trials (Wilcoxon rank sum test, $p = 0.46$), suggesting food availability had minimal influence on behavior. Our findings support adult territoriality but suggest competitive feeding interactions are not the main driver of species segregation, informing future sculpin reintroductions.

A.4 Stable Isotope Analysis of Trophic Dynamics in Upper Mississippi Backwaters

Caden Boge
Co-author: Eric Strauss
Mentor: Eric Strauss, Biology

The Upper Mississippi River is a complex mosaic of habitats, including a channelized main channel, secluded backwaters, floodplain forests, expansive marshes, and numerous transitional environments. Understanding how energy flows among these habitats is critical for effective management and for monitoring disturbances such as pollution and invasive species. This research will assess energy flow through the lower trophic levels of backwater ecosystems using stable isotope analysis. Carbon and nitrogen isotope signatures from a range of organisms—including algae, zooplankton, invertebrates, and plants—will be used to identify primary carbon sources and trophic relationships. For example, an aquatic beetle that primarily consumes a specific aquatic plant is expected to exhibit a similar carbon signature, along with an elevated nitrogen signature indicative of a higher trophic position. Carbon sources of local and external origin will be reflected in the isotopic signatures of higher trophic-level organisms and therefore will indicate the source of energy driving backwater aquatic communities. Results will be compared with findings from a previous study conducted in the main channel near Winona, Minnesota, which indicated that carbon sources originated largely within the main channel rather than from upstream inputs or surrounding floodplains.

A.5 Spatiotemporal Patterns in Dissolved Organic Carbon Concentration and Biodegradability in the Upper Mississippi River Pool 8

Vera Hrdlicka
Mentor: Eric Strauss, Biology

Large river systems link terrestrial and aquatic environments, and are responsible for transporting a range of materials, including dissolved organic carbon (DOC). DOC is a vital resource for aquatic ecosystems and the global carbon cycle, as it contributes to the release of greenhouse gases through microbial respiration. The origin of carbon, autochthonous vs. allochthonous, generally determines preferential DOC use. Over time, the composition and quality of DOC can shift based on microbial preferences. DOC dynamics in the Upper Mississippi River (UMR) is poorly understood. Sampling occurred once in August and twice in October 2025 at eight main channel sites, six backwater sites and four Black River sites, to determine patterns across space and time. DOC concentrations were measured and optical properties related to quality were analyzed using UV-visible light spectroscopy and fluorescence (SUVA254, E2:E3, CDOM). In addition, biodegradability was assessed with 21-day incubations. The preliminary results suggest that DOC concentration varies temporally more than spatially. DOC concentrations were higher in August samples compared to both October sample periods. Little variation was found between backwater and main channel sites for DOC concentration, amongst all sample periods. Biodegradability assays suggest little change in the loss of DOC over time.

A.6 Microplastic Consumption in Birds from the Upper Mississippi River Watershed near La Crosse, WI

Kassandra Zimmer
Co-authors: Eric Strauss and Markus Mika
Mentors: Eric Strauss and Markus Mika, Biology

Microplastics are nonbiodegradable particles (250µm-5mm) polluting environmental systems. Birds are model organisms for microplastic analysis due to high mobility, their distribution across trophic levels, and as examples of biomagnification for pollutants. This study recorded abundance and locations of microplastic accumulation in digestive tracts and how species-specific accumulation varies with mass and trophic level. Specimens (n = 123) from 50 species were collected postmortem in Wisconsin and digestive tracts were isolated and treated with KOH to break down organic matter. The solution was density separated in CaCl to remove heavier materials. We isolated microplastics on filters for enumeration and general characterization via microscopy. Furthermore, Fourier Transform Infrared (FTIR) Spectroscopy will verify microplastic polymer type. In total, 1538 microplastic particles were found in 123 bird digestive tracts (mean[range] = 12.5[0-83] particles/bird). Smaller birds exhibited a higher abundance of microplastics per gram of body weight. There was no significant difference in the site of microplastic accumulation within digestive tracts and birds in the 2.5-3.0 trophic guild contained the most microplastics. These results confirm birds are ingesting microplastics, however harmful thresholds remain unknown. Regardless, the prevalence of microplastics in birds highlights the importance of reducing plastic pollution and need for monitoring microplastics in ecological systems.

A.7 Determining the Effects of Triple-Negative Breast Cancer on Megakaryocytes Using Conditioned Media

Shreyosi Mukherjee
Co-author: Jaclyn Wisinski
Mentor: Jaclyn Wisinski, Biology

Triple negative breast cancer is particularly a very aggressive form of cancer that often metastasizes to places like the bone marrow and does not respond well to treatment. The researchers hypothesize that breast cancer cells release molecules that affect neighboring cells, perhaps including the platelet-producing megakaryocytes of the bone marrow. This project seeks to determine whether triple negative breast cancer (TNBC) cells, when radiated or not, can alter the physiology of megakaryocytes. The radiation lethal dose (LD)50, LD25, and LD12.5 will be used to treat breast cancer cells, and the soluble molecules released into the media will be collected as conditioned media. The conditioned media will be used to treat the megakaryocyte culture. Proliferation and adhesion of the megakaryocytes will be monitored using an MTS survival assay and a Crystal Violet adhesion assay, respectively. This project can determine correlation between breast cancer cells and how it essentially affects the bone marrow microenvironment.

A.8 Interactions between the Gut Microbiome and Circadian Rhythm in *Drosophila melanogaster*

Mikayla Johnson
Mentor: Alder Yu, Biology

Circadian rhythms are cyclic variation in behavior and physiology over a roughly 24-hour period and are under genetic control. Metabolites produced by the gut microbiome may influence the circadian rhythm through changes in gene expression. At the same time, the circadian rhythm influences the composition of bacteria found within the gut microbiome throughout the day. Interactions between circadian clock status and the microbiome on feeding rhythms have not been thoroughly investigated. This research aims to elucidate the effects of the gut microbiome on the circadian rhythm in the fruit fly (*Drosophila melanogaster*). We compared circadian mutant flies, which lack a fuctional circadian clock, with wild-type flies with a functional clock. The CAFE assay was used to monitor feeding activity, allowing us to determine the effects of mutations in central circadian clock genes and the gut microbiome on feeding activity. Our preliminary results suggest that feeding rhythms are not soley under genetic control and different clock genes may affect feeding rhythms in different ways. These preliminary findings support the idea that previous research has overlooked the complexities of feeding rhythms. In the future, the feeding rhythms of germ-free flies will be compared to conventional flies using the CAFE assay.

A.9 Influence of Dispersal Limitation and Environmental Factors on Aquatic Invertebrate Communities in the Upper Mississippi River

David Ellefson
Mentor: Ross Vander Vorste, Biology

The Upper Mississippi River System includes a dynamic network of side channels and floodplains that experience disturbances, such as floods and droughts. Recovery of disturbed habitats is often facilitated by the dispersal of aquatic invertebrates, which provide ecosystem functions and support aquatic communities following disturbances. When invertebrate dispersal is limited, the recovery of aquatic communities may be comparatively slower than when dispersal is not limited. Invertebrate dispersal is likely influenced by the distance of travel, mode of dispersal, and local environmental conditions. Therefore, I hypothesize that invertebrate richness and abundance will show patterns related to flow path and Euclidean distance. If aquatic invertebrates are not dispersal limited, I predict to see no significant patterns between richness or abundance and distance, but rather correlation with local environmental factors (e.g., dissolved oxygen, temperature, conductivity, pH). In summer 2026, I will sample invertebrate communities across a gradient of distance categories and determine their richness and abundance. Furthermore, I will collect data related to water quality and sediment to understand how biotic and abiotic factors influence floodplain invertebrate communities. Findings may further our understanding of aquatic invertebrate dispersal and its role in facilitating habitat recovery in large river systems.

A.10 Climate Variability Influences Charcoal Accumulation in Lake Sediments during the Late Holocene

David Ellefson
Mentor: Joan Bunbury, Geography & Environmental Science

During the late Holocene, climate variability included periods of warmer/drier and cooler/wetter conditions, influencing wildfire frequency and intensity. Charcoal produced during the combustion of vegetation is continuously accumulated in lake sediments, serving as a proxy of past wildfire activity. The objective of this study is to determine the correlation between charcoal accumulation and periods of warm/dry and cool/wet climates during the Holocene. To achieve this, a sediment core was collected from Mud Lake, WI, in June 2019. A chronology was developed using 17 lead-210 and four radiocarbon determinations. Loss on ignition was performed to determine the organic content of the sediments, and particle size analysis was used to characterize the sand, silt, and clay content. Charcoal is expected to be more abundant during dry periods with warmer temperatures and less abundant during wet periods. Furthermore, the organic and sand content are likely to correspond to periods of high precipitation that promote productivity within the lake and watershed, as well as wash larger particles into the lake. Finer, wind-deposited sediments (i.e., silt and clay) likely correspond to periods of low precipitation. Comparisons with other paleoclimate records from the region will also be made.

A.11 Comparative Effects of Dry Cupping and Stretching on Perception and Functional Movement Screening Scores

Amanda Ferguson, Leamae King, and Brody Sipiorski
Mentors: Kari Emineth and Cordial Gillette, Exercise & Sport Science

Cupping therapy is a myofascial decompression technique used to reduce pain and improve circulation and mobility. Although commonly applied after injury, its preventative use in healthy individuals is not well understood. Because improvement in mobility, flexibility, and perceived well-being may reduce injury risk, this study examined whether prophylactic cupping, with or without stretching, enhances functional movements and perceived quality of life in healthy adults. Perceived health was measured using the SF-36, which assesses physical and mental health domains. This randomized controlled study included twenty healthy adults aged 18-26 years. Baseline assessments included the Functional Movement Screen (FMS) and SF-36. Participants were randomly assigned to a control group, cupping-only group, or cupping-plus-stretching group. Intervention groups received weekly cupping for four weeks targeting the lower back and hamstrings; the combined group also completed a standardized static stretching routine. Post-intervention FMS and SF-36 assessments evaluated changes in movement and perceived health. Data were analyzed using repeated-measures ANOVAs with significance set at $\alpha = 0.05$. FMS scores improved across all groups ($p = 0.007$), with no significant between-group differences ($p = 0.581$). SF-36 scores showed no significant changes. Prophylactic cupping, with or without stretching, did not significantly improve functional movements or perceived quality of life.

A.12 Human Tissue Temperature Rise during Ultrasound Treatments vs. Combination Therapy

Miah Lemanski, Marisa Zepeda, Lauren Koss, and Trinity Roberts
Co-authors: Naoko Giblin and Kari Emineth
Mentors: Cordial Gillette and Scott Doberstein, Exercise & Sport Science

The objective of this study was to compare the heating effects of therapeutic ultrasound (US) alone versus a combination of US and electrical stimulation (CO) on tissue temperature. Twenty subjects attended one session consisting of bilateral rectus femoris muscle tissue temperature measurement, and randomization of two treatment conditions: US and CO. Following the first treatment, the second treatment was performed on the contralateral extremity. US was done in continuous mode with parameters of 1.5 W/cm^2 intensity and 3.3-MHz frequency. CO was completed with the same parameters; the stimulation intensity was set to a comfortable level based on the subject's tolerance. A 2-way (modality and time) repeated measures ANOVA was performed to examine the temperature differences. The rectus femoris temperature increased over time and was statistically significant ($P < 0.001$) regardless of treatment (US or CO). Temperature immediately post treatment was highest compared to baseline and 5-, 10- and 15-minutes post-treatment in both treatment groups ($P < 0.001$). However, there was no significant difference ($P = 0.627$) between US or CO treatments on tissue temperature. The findings of this study emphasize the similarities regarding tissue temperature increases while utilizing either US or CO. To achieve the same desired thermal effects, US may be utilized alone without the addition of the extra modality of electrotherapy (CO).

A.13 External Cues May Increase Asymmetry in Sit-to-Stand Performance in Individuals with Parkinson's Disease

Kylie Alger, Hailey Carlson, Maggie Cristoforo, Ashley Hanson, Cory Kaiser, Madalyn Williams, and Grace Willmott
Mentor: Naghmeh Gheidi, Health Professions

Parkinson's disease (PD) commonly impairs balance and functional mobility. Sit-to-stand (STS) is a critical movement for daily activities. Although auditory (A) and visual (V) cues can improve motor performance in PD, their effects especially with increased pacing on STS are unclear. Purpose: To examine the effects of A and V cues, and faster pacing, on STS performance in individuals with PD. Methods: Seven individuals with idiopathic PD (mean age 71.1 ± 5.7 years; Hoehn & Yahr stage 2) completed three baseline STS trials, followed by three trials each under A cue (metronome), V cue (flashing circle), and control conditions. Each cue had normal and fast (+5%) pacing. Participants stood on dual force platforms with full-body motion capture. Asymmetry index (AI) during the second standing phase and total STS time were analyzed. Effect sizes (Cohen's d) were calculated. Results: Both A (AI 5.54 ± 3.81; ES 0.89) and V (AI 6.58 ± 2.88; ES 1.5) cues increased asymmetry compared to control (AI 2.78 ± 2.17). Faster pacing further increased AI (A+5%: 6.82 ± 4.91; ES 1.06; V+5%: 6.9 ± 5.17; ES 1.04). Total STS time was unchanged. Conclusion: External cues, particularly at faster speeds, may disrupt automatic motor control and increase limb asymmetry during STS. Clinicians should apply cueing cautiously to promote safe, balanced performance.

A.14 Occupational Therapy for Chronic Pain: Practitioner Insights on Barriers, Gaps, and Future Directions

Julia Seidel, Natalie Brauer, Molly Loy, Amanda Martin, Emma Mickelson, and Madison Wrobleski
Co-authors: Brandon McCauley and Polly Berra
Mentor: Naghmeh Gheidi, Health Professions

Chronic pain (CP) affects approximately 24% of the U.S. population and represents a significant, complex public health issue. Occupational therapy practitioners (OTPs) face challenges providing CP care, including limited role awareness, lack of evidence (Katzman, 2024), and financial/insurance barriers. This cross-sectional study used an anonymous 19-question Qualtrics survey to identify challenges, gaps, and recommendations for improving care among OTPs who treat CP. This survey remains open to increase the sample size. Demographics collected included years in practice, CP experience, and education. OTPs selected perceived challenges, gaps, and recommendations from a list of evidence-based approaches. Among 170 OTPs, 45.7% had ≥ 20 years in OT, and 34% treated CP for 1-5 years, with 68.1% reporting training via continuing education. Top challenges included patient adherence (79.3%), limited therapist training (56.0%), and barriers to patient access (56.0%). Key gaps were limited time for evidence-based care (68.1%), insurance restrictions (57.8%), limited prevention strategies (55.2%), and insufficient intervention knowledge (51.7%). Reported solutions included formal training (86.2%), increased education (81.0%), and using occupation-based models specific to CP (64.7%).

A.15 Impact of Pelvic Floor Dysfunction Symptoms on Occupations in Community Dwelling Older Women

Lindsey Tatro, Helena Zajac, Grace Stockwell, Alexis Lannoye, Hannah Johnson, and Caitlin Caretta
Mentors: Naghmeh Gheidi and Kim Servais, Health Professions

Pelvic floor dysfunction (PFD) results from weakened or injured pelvic muscles and connective tissues and may lead to urinary or fecal incontinence, pelvic organ prolapse, and pelvic or perineal pain. These symptoms can cause physical discomfort, emotional distress, social withdrawal, and reduced participation in daily activities. In older adults, PFD may worsen mobility limitations, increase dependence, and elevate fall risk. Despite its prevalence, PFD in older women is often underdiagnosed and undertreated due to stigma, limited awareness, and barriers to care. Greater research attention is needed to better support independence and quality of life in this population. This study will examine the impact of PFD symptoms on women aged 60 and older, focusing on disruptions to daily activities. A 17-question online survey will be administered to women who can comprehend and respond independently, assessing challenges related to toileting, dressing, and social participation. The survey will be distributed through social media, community flyers, local events, and email outreach to university faculty and staff. In-person interviews will be offered as an alternative for residents of Hillview Terrace.

A.16 Effect of Walking with a Dog on Gait Mechanics in Older Adults

Rachel Gundrum, Brooke Bremness, Breelyn Neuroth, Samantha Ganther, McKenzie Ryan, Alex Ricci, and Mathea Diedrich
Mentor: Naghmeh Gheidi, Health Professions

As we age, physical activity and balance are negatively impacted, which, in turn, results in gait disorders becoming more common, affecting approximately one in three older adults. This population requires more time to walk with more compensatory steps to avoid falling and to maintain balance. Previous studies showed a positive relationship between dog ownership and increased physical activity; however, research is lacking on how walking with a dog impacts gait mechanics. This study aims to measure the impact of walking with a dog on gait mechanics in older adults. This study includes healthy males and females, over the age of 65. Participants were screened with a questionnaire before the study to determine health status. Kinematics and kinetics data including step length, cadence, joint angles, and ground reaction forces were taken using a motion analysis system and a force platform. This study used a repeated measures design and participants underwent five trials of with and without dog at normal, increased and slow speeds in a randomized order with a minute rest between each trial. Repeated measure ANOVA with a Bonferroni correction (alpha level of 0.05) were used to compare the conditions.

A.17 Effects of Concurrent Visual Feedback Peak Ground Reaction Force Symmetry during Running Post ACL Reconstruction

Lillian Baker, Kaitlyn Pagenkopf, Erin Stecker, and Adeline Walton
Co-authors: Drew Rutherford and Patrick Grabowski
Mentor: Thomas Kernozek, Health Professions

Asymmetries in peak vertical ground reaction force (vGRF) are common in individuals post anterior cruciate ligament reconstruction (ACLR). Concurrent visual feedback on vGRF may improve symmetry. PURPOSE: Determine if concurrent visual vGRF feedback reduces asymmetry in peak vGRF, vGRF impulse, and cadence post ACLR. METHODS: 25 females ran on an instrumented treadmill at 6.7 mph where kinetic data (1800 Hz) were obtained during the baseline trial (Base). A concurrent feedback display with peak vGRF was provided to alter asymmetry (Feed). Feedback was removed to assess retention (Ret). 56% of participants (n = 14) responded to feedback and were analyzed. Repeated measures ANOVAs examined changes across time ($\alpha = 0.05$) and post hoc tests were performed. RESULTS: Peak vGRF ($p = 0.001$) and cadence ($p < 0.001$) changed, but not impulse ($p = 0.890$) (Table 1). Changes were found inpPeak vGRF between Base (3.14 ± 2.62 BW) and Feed (1.96 ± 2.69 BW) and between Base and Ret (2.26 ± 2.45 BW). No change in vGRF between Feed and Ret. Changes occurred in cadence between Base (169.05 ± 5.94 steps/min) and Feed (171.92 ± 6.13 steps/min) and between Base and Ret (172.36 ± 4.89 steps/min). No changes between Feed and Ret. CONCLUSIONS: Feedback decreased peak vGRF asymmetry and increased cadence in ACLR runners that responded. These alterations were retained after feedback removal.

A.18 Influence of Lunge Variations on Patellofemoral Joint Loading and Kinematics

Cooper Krokstrom and Jameson Langer
Mentor: Thomas Kernozek, Health Professions

Patellofemoral joint (PFJ) pain is prevalent among active females; increased PFJ forces may increase symptoms. Understanding PFJ loading in lunge variations may guide exercise progression. PURPOSE: Examine differences in PFJ related loading variables and kinematics during lunge variations. METHODS: 27 college-aged, recreationally active females were measured using 3-D kinematic data (180 Hz) from a 16-camera motion analysis system and kinetic (1800 Hz) data from a force platform. In random order, the following were performed: a lunge with the participant stepping forward and returning to start position (static lunge) or a continuous lunge with the participant walking forward (dynamic lunge). All participants completed five recorded repetitions per variation at a rate of 40 bpm. Inverse dynamics and static optimization using a 16-segment musculoskeletal model determined muscle forces and kinematics; the data were used to calculate PFJ kinetics. A paired samples t-test examined differences ($\alpha = 0.05$). RESULTS: PFJ loading changed between lunge types ($p < 0.05$). The dynamic lunge increased PFJ stress by 9% compared to the static lunge. CONCLUSION: Walking lunges increased PFJ stress compared to the stationary lunge. These loading differences may inform exercise programs for rehabilitation professionals.

A.19 Menstrual Cycle Influence on Jump-Landing Force Production and Fatigue Response in Recreational and Collegiate NCAA Female Athletes

Paul Kaiser, Kaylee Bjork, and Jess Roush
Mentors: Megan Litster and Ward Dobbs, Health Professions

INTRODUCTION: With growing female sport participation and injury rates, understanding the menstrual cycle's potential impact on performance is crucial. PURPOSE: This study aims to investigate the potential influence of female hormonal fluctuations on jumping and landing characteristics in collegiate softball and recreational athletes as they fatigue. METHODS: 15 recreational and collegiate female athletes (Ages: 18-22) underwent a protocol consisting of repetitive cycles of 10 maximal repeat jumps and three drop landings to induce fatigue and compare results between menstrual cycle phases. The study aims to determine the relationship between hormonal variation and sport-specific force parameters. RESULTS: This research will contribute to the limited body of evidence examining the interaction between menstrual cycle phases and athletic performance, addressing a critical gap in the literature. Results have the potential to influence optimal training interventions and introduce safety considerations for training female athletes. DISCUSSION: Data collection and analysis is ongoing. This abstract is submitted as a work in progress and will be ready for dissemination prior to the symposium.

A.20 Relationship of the Menstrual Cycle Phases on Physiological Fatigue in Recreational and Collegiate NCAA Female Athletes

Madison Page, Ellyn Lepisto, and Abby DeMoe
Mentors: Megan Litster and Ward Dobbs, Health Professions

The menstrual cycle consists of three phases (follicular, ovulary, and luteal) typically occurring over a 28-day period. Fluctuations in estrogen and progesterone within and between phases may influence physiological fatigue. PURPOSE: This study aims to determine the potential relationship of the menstrual cycle phases on physiological fatigue in recreational and collegiate NCAA female athletes using salivary hormone analysis and heart rate-based fatigue measures. METHODS: Fifteen female Division III NCAA softball players and recreationally active females aged 18-22 years participated. Participants utilizing hormonal birth control were included. Four testing sessions were conducted across one menstrual cycle. Salivary samples were collected at each session to quantify estrogen and progesterone concentrations and confirm cycle phase. Participants completed repeated rounds of ten countermovement jumps followed by three drop landings until voluntary fatigue or observable form failure. Physiological fatigue was assessed using continuous heart rate monitoring, including peak heart rate and heart rate recovery. RESULTS AND DISCUSSION: Data collection and statistical analysis are ongoing. This abstract is submitted as a work in progress and will be ready for dissemination prior to the symposium.

A.21 Exercise-Specific Differences in Foot Morphology in College-Aged Females: Implications for Lower Extremity Injury Screening

Colten Brand, Jordan Mernaugh, Kaitlyn Schrimpf, Marli Evans, and Sydni Erickson
Mentor: Shane Murphy, Health Professions

Lower extremity injuries are prevalent in physically active populations, leading clinicians and coaches to seek effective screening tools to identify individuals at increased risk. Foot and ankle morphology has been proposed as a contributing factor; however, inconsistent findings in the literature may reflect variability in measurement reliability. This study examined differences in foot and ankle characteristics among aerobic-trained, resistance-trained, and combination-trained athletes using reliable and validated assessments. Participants were convenience-sampled and reported engaging in at least 150 minutes of physical activity per week. Exercise type was categorized via self-report survey. Measures included the Foot Posture Index, Navicular Drop Test, and diagnostic ultrasound imaging of plantar fascia and Achilles tendon thickness. Multiple one-way ANOVAs evaluated differences among exercise groups ($\alpha = 0.05$), and Hedge's g was calculated to determine effect sizes. When matched for physical activity volume, no statistically significant differences were found between groups across all measures ($p \geq 0.10$). However, a large effect size ($g = 0.8$) was observed between aerobic- and resistance-trained groups for the Navicular Drop Test. Although underpowered, these findings suggest potential exercise-specific adaptations in foot morphology. Larger samples are needed to confirm whether clinical thresholds for abnormality should differ by training type.

A.22 Piloting Methods to Observe Unilateral Amputees in a Real-World Setting

Lauren Foyt, Kamille Steckbauer, Kyla Johnson, Katherine Zacharias, Sandy Bune, Morgan McNeill, and Luke Juve
Co-author: Hannah Powers
Mentor: Shane Murphy, Health Professions

Unilateral transtibial amputees who use prosthetics display gait asymmetries and altered movement strategies. These patterns guide effective rehabilitation and improve quality of life. A knowledge gap exists between available technology and the ability to utilize instruments in real-world situations. Biofeedback with 3D motion capture and force plate data has been effective in gathering reliable and valid measures of spatial temporal gait parameters and ground reaction force data. To obtain data in a clinically feasible setting, biofeedback using Load Soles provides a portable alternative. Our purpose is to describe a case-study of intra-limb asymmetries during ambulation (i.e., Gait-rite) and standardized clinical assessments (i.e., TUG and FSST) in an individual with a unilateral transtibial amputation. All measures were taken on a middle-aged white male with a unilateral transtibial amputation, categorized at the K3 functional level. Over a 10-month span, clinical assessments and questionnaires (i.e., FESI, SF-36, PLUS-M, SCS, TUG, FSST), gait, balance, and quadricep tendon thickness were assessed. Findings will be presented within the research team's evaluation of each tool's reliability, emphasizing a balance between ecological validity and measurement validity. Gait, balance, and clinical measures will be scaled to a series of unilateral transtibial amputees to minimize instrumentation and either facilitate detailed gait analyses or provide real-time gait biofeedback.

A.23 Analyzing Commuting Patterns in La Crosse County

Anna Bowes and Zeina Battah
Mentor: Reisa Widjaja, Mathematics & Statistics

Transportation plays an essential role in daily life as individuals commute to work, school, and other activities. The many modes of transportation that use gas or electricity contribute to the total emission of greenhouse gases. In this study, we will be analyzing transportation data from different areas within La Crosse County in Wisconsin to test for a difference in the average distance for each mode of transportation used while commuting. We will do this by performing statistical tests within R Studio. Once we have cleaned the data and checked for the assumptions that come with using the ANOVA test, then we can use the outputs to make conclusions about our population. From this test, we would expect to find out whether there are differences between the average distance commuted for the modes of transportation to gain insight into commuting patterns within La Crosse County.

A.24 Influence of GOX1969 on the Growth and Bioproductivity of *Gluconobacter oxydans*

Kalie Butcher
Mentor: Paul Schweiger, Microbiology

Gluconobacter oxydans is a gram-negative acetic acid bacterium. Their unique metabolic characteristics enable the incomplete oxidation of various carbohydrates and alcohols. This process is mediated by membrane-bound dehydrogenases, many of which are pyrroloquinoline quinone (PQQ)-dependent. GOX1969 was mischaracterized as a PQQ-dependent dehydrogenase and was shown to be a functional BamB homolog that is part of the β-barrel assembly machinery (BAM) complex that inserts porins into the outer membrane. Overexpression of GOX1969 in *E. coli* improved the growth rate. We hypothesize that GOX1969 overexpression will similarly improve the growth of *G. oxydans*. This study aims to examine the influence of GOX1969 on the growth of *G. oxydans* by expressing the *gox1969* gene using three plasmids with different promoter strengths. The growth phenotypes of the *G. oxydans* overexpression strains will be monitored and correlated to promoter strength and growth rate. The production of gluconate from glucose will also be assessed to determine the amount of glucose being consumed when GOX1969 is being expressed. These findings not only will provide insights into *G. oxydans* physiology, but pave the way for engineering overexpression strains with improved growth and industrial bioproduction yields.

A.25 Effectiveness of Mindfulness Exercises on Student Re-engagement in the Classroom

Lindsay Ferry
Mentor: Rob Dixon, Psychology

The purpose of this project design is to determine the impact that mindfulness activities have on a child's ability to re-engage in classroom learning after an 'unregulated behavioral event.' To conduct this research, mindfulness, self-regulation, and engagement must all be defined. "Mindfulness is a powerful tool that supports children in calming themselves, focusing their attention, and interacting effectively with others, all critical skills for functioning well in school and in life," said Amy Saltzman, M.D., director of the Association for Mindfulness in Education, and director of Still Quiet Place (2025). "Self-regulation is a complex, multi-component construct (Vohs & Baumeister, 2011) operating across several levels of function (e.g., motor, physiological, social-emotional, cognitive, behavioral and motivational), that in its broadest sense represents the ability to volitionally plan and, as necessary, modulate one's behavior(s) to an adaptive end" (Barkley, 2011). Engagement refers to students' attitude towards school and their participation in school and classroom activities according to EdReform. Determining whether there is a connection between a student's positive engagement in learning and mindfulness activities will be important for all educators in a classroom setting. If there is a connection between the two, educators should strongly consider implementing mindfulness activities in their classrooms frequently throughout the school day.

A.26 Rural Mental Health: Building Blocks to Successful Mental Health Programming

Raeann Henke
Co-authors: Rob Dixon and Jocelyn Newton
Mentors: Rob Dixon and Jocelyn Newton, Psychology

This research aims to examine the effects of teacher type and years of experience on knowledge of mental health identification and satisfaction with current Tier 1 mental health practices. School leaders and board members must understand educators' perspectives to recognize the challenges teachers face, particularly when students lack sufficient mental health services. This understanding is vital for providing training in mental health identification and support through tiered services. Through this research study, the quantitative and qualitative data show the following results: 1) Rural educators were able to identify anxiety, depression, and trauma through behavioral shifts and withdrawal. 2) Teachers cite structural barriers including limited staff, funding shortfalls, and limited resources due to rural isolation. 3) Perceptions of Tier 1 support are consistent across groups. 3a) Both general education staff and special education staff request more training and student support.

A.27 Executive Functioning: The Impact of Extracurriculars

Cassandra Ninnemann
Co-author: Rob Dixon
Mentor: Rob Dixon, Psychology

The purpose of this research is to understand whether participation in after-school activities is associated with the development of essential life skills that support students' daily functioning.

A.28 Strategically Impacting Student Mental Health: Conducting a Needs Assessment

Talia Yaucher
Mentor: Rob Dixon, Psychology

This study examines school staff's mental health literacy and Tier 1 supports to better understand how knowledge, attitudes, and programs influence and promote student mental well-being within multi-tiered support systems.

A.29 Grounded Growth: The Therapeutic Use of Horticulture in Adult Depression Reduction

Alexis Weber
Mentor: Tara Delong, Recreation Management & Therapeutic Recreation

Depression causes symptoms such as low positive affect, feelings of helplessness, amotivation, and loss of interest in things that were once found interesting or important. Personal hygiene and social relationships can be affected by these symptoms. It is therefore crucial to the functioning of an individual with depression to find ways to alleviate these symptoms. The therapeutic use of horticulture has demonstrated improvements in many depression symptoms. This poster will review Grounded Growth, an eight-week Therapeutic Horticulture program that utilizes interventions, such as succulent wreath making, personalizing garden beds, and recognizing emotions through creative expression to increase positive emotions and alleviate depression symptoms. Proposed outcomes include increased positive emotions, leisure engagement, emotional agility, and positive relationships.

A.30 Environmental Levels of PFAS Exposure Cause Immune Dysfunction in Larval Fish

Samantha Lyons
Mentor: Tisha King-Heiden, Biology

Per- and polyfluoroalkyl substances (PFAS) are persistent environmental contaminants associated with adverse health effects, including cancer, neurotoxicity, and reduced vaccine efficacy. However, their impact on innate immune function remains poorly understood. The innate immune system serves as the first line of defense against pathogens, in part through a neutrophil-mediated respiratory burst that generates reactive oxygen species to eliminate pathogens. Suppression of this response may increase susceptibility to disease. This study evaluated the effects of chronic, environmentally relevant exposure to PFOS and PFHxS on innate immune function in zebrafish (*Danio rerio*) and fathead minnows (*Pimephales promelas*). Fish were exposed via water shortly after fertilization through completion of embryo-larval development. Immune responses were assessed by quantifying respiratory burst activity and neutrophil abundance. Exposure did not produce consistent dose- or species-dependent effects. However, PFOS exposure reduced neutrophil counts in fathead minnows and suppressed respiratory burst activity in zebrafish, while PFHxS exposure also suppressed respiratory burst activity in zebrafish. These findings indicate that PFAS can alter innate immune responses in fish in a species-specific manner, potentially increasing susceptibility to pathogen-induced mortality and highlighting ecological risks associated with environmentally relevant PFAS exposure.

A.31 Enhancing Safety and Skill Progression through Freestyle-Based Learning at Mount La Crosse

Julia Larson
Mentor: Kate Evans, Recreation Management & Therapeutic Recreation

Terrain parks are central to modern ski area experiences, particularly for participants interested in freestyle skiing and snowboarding. At Mount La Crosse, riders currently access the terrain park without structured education on freestyle fundamentals, safety practices, or skill progression. This lack of formal instruction increases the potential for preventable injuries and inconsistent feature use while placing added demands on operational staff. This project proposes the development of a freestyle-based learning program designed to enhance safety while promoting intentional skill progression. The program emphasizes proactive education through guided instruction on freestyle techniques, terrain park etiquette, risk awareness, and appropriate feature selection based on ability level. By integrating structured learning opportunities into the freestyle environment, this initiative aims to foster a culture of safety, confidence, and progression rather than trial-and-error participation.

A.32 Peaceful Creations: Mindfulness Art-Based Recreational Therapy Curriculum for High-Risk Youth

Isabella Smerz
Mentor: Lindsey Kirschbaum, Recreation Management & Therapeutic Recreation

Over 32 million youth under the age of 17 have experienced at least one adverse childhood experience. High-risk youth are more likely than their peers to face adverse outcomes due to the social, economic, familial, and behavioral challenges they encounter. This can result in behavioral disabilities, untreated mental health issues, and emotional and physical abuse. Mindfulness art-based interventions have shown to help youth identify and regulate their emotions during stressful situations, and enhance healthy coping skills through painting, drawing, and purposeful art creation. This poster will

review Peaceful Creations, an evidence-based recreational therapy curriculum for high-risk youth who are enrolled in an alternative therapeutic day school. This poster will address the needs of high-risk youth and outline mindfulness-based art interventions that are grounded in the Mindfulness Stress-Based Reduction theory (MSBR) and utilized throughout the program.

A.33 Nature Therapy for Veterans with PTSD in Recreational Therapy

Abigail Prokes
Mentor: Lindsey Kirschbaum, Recreation Management & Therapeutic Recreation

Over 6,000 veterans commit suicide each year. Veterans who are diagnosed with post-traumatic stress disorder may experience bursts of anger, flashbacks, hyper-vigilance, isolation, negative mood or depression, anxiety, and or suicide. The natural setting is ideal for veterans with PTSD due to the limited stimulation from the environment and the increased outcomes from an immersive present-moment experience. This new evidence-based curriculum, called Grounded Horizons Nature Therapy, was created to reduce suicide rates through post-traumatic growth and improved well-being. This curriculum is delivered in person, with hour-long sessions once a week for eight weeks. Each session is conducted in an outdoor setting and uses self-determination theory to frame participant goals, including increasing nature connection, social connection, competence in mindfulness activities, and autonomy, thereby enhancing well-being. The setting simultaneously improves cellular health, heart health, positive mood, and vigor. This program will increase competence in mindfulness activities to incorporate into daily life, enhance well-being, and provide a setting in which the benefits are extensive.

A.34 Caught in the Headlights: An Exploratory Study Interpreting Prevention Techniques of Human-Wildlife Techniques on Roadways in National Parks

Elise Hetzel
Mentor: Brian Kumm-Schaley, Recreation Management & Therapeutic Recreation

The purpose of this project is to explore and identify strategies and practices that could be implemented in National Parks to decrease the fatal interactions between humans and wildlife. Using general qualitative methods, inspired by phenomenological commitments to understanding lived realities, this research will utilize one-on-one interviews with National Park Rangers. Because park rangers can be responsible for the removal of the carcasses off the roadways, these individuals are the ones this study seeks to recruit. This project aims to protect and conserve wildlife and visitors alike in our National Park System. Efforts will be made to find a solution to this problem that will benefit all parties involved. For the sake of this project, the focus is specifically on National Parks, but the findings from this research could be applied to any roadway that has been impacted by vehicle and wildlife collisions.

A.35 Grip and Grow: An Evidence-Based Recreational Therapy Curriculum to Support Anxiety Management in College Students

Jenna Mallon
Mentor: W. Thomas Means, Recreation Management & Therapeutic Recreation

Anxiety is one of the most prevalent mental health concerns among college students and can negatively impact academic performance, emotional regulation, and overall well-being. College students often experience increased stress related to academic expectations, social pressures, and transitional life challenges. Research suggests that experiential and physical activity-based interventions can improve emotional regulation, confidence, and coping skills in individuals experiencing anxiety. Grip and Grow is an evidence-based recreational therapy curriculum developed to address anxiety in college-aged populations through therapeutic rock climbing. Grounded in Bandura's Self-Efficacy Theory, the curriculum incorporates mastery experiences, social support, and skill development to strengthen coping strategies and confidence. The program consists of four structured sessions implemented in a campus rock climbing facility by a Certified Therapeutic Recreation Specialist (CTRS). Grip and Grow aims to improve self-efficacy, emotional regulation, and adaptive coping skills while advancing evidence-based recreational therapy practice.

A.36 Walls of Expression: An Evidence-Based Recreational Therapy Collaborative Mural Program for Youth at Risk

Taylor Quickstrom
Mentor: W. Thomas Means, Recreation Management & Therapeutic Recreation

Youth at risk are individuals who experience social, familial, and structural challenges that increase vulnerability to negative outcomes such as psychosocial challenges, strained relationships, stigma and bias, and limited access to creative opportunities. Therefore, fostering empowerment, social inclusion, and safe creative environments is essential. Collaborative art is a proven approach in fostering belonging, reducing loneliness, supporting identity development, and encouraging self-reflection and personal growth through shared creative expression and connection. These outcomes increase the likelihood that youth become active, empowered members of their communities. Walls of Expression: A Collaborative Mural Program is an eight-week, evidence-based curriculum designed for youth experiencing challenges in a community-based parks and recreation setting as a recreational therapy intervention. Grounded in the Harm Reduction Theory and supported by the Empowerment Process Model, participants engage in collaborative mural making to build skills, share their voice, foster empowerment, self-expression, social inclusion, and motivation for safer, healthier choice. The fidelity manual was developed to strengthen evidence-based recreational therapy practice and ensure consistent implementation of an empowerment program for youth at risk that also addresses multiple social determinants of health.

A.37 The Art of You: An Evidence-Based Recreational Therapy Curriculum for Adults with Intellectual and Developmental Disabilities

Lauren Wiseman
Mentor: W. Thomas Means, Recreation Management & Therapeutic Recreation

Approximately 107.6 million people globally are diagnosed with an intellectual or developmental disability (IDD). IDD is characterized by challenges in communication, self-expression and adaptive behaviors. One way for adults with IDD to combat these challenges is through the therapeutic use of arts which have been shown to help adults with IDD form a sense of positive self-identity through self-expression, connection to peers, and a sense of control over their art. This results in better skills in managing and overcoming major life decisions and challenges. The Art of You evidence-based curriculum is a 10-week program for individuals with IDD that focuses on building participants' sense of autonomy, competence and relatedness, the tenets of Self-Determination Theory. Through The Art of You program, participants explore various mediums of art through activities that build personal identity and self-expression skills using art journaling. The Art of You curriculum is designed to be implemented in any community-based setting for individuals with intellectual or developmental disabilities. This program assists in meeting the need for evidence-based practice in recreational therapy by providing access to research-based programs for professionals to utilize.

A.38 G.R.O.W. (Grounded Resilience through Outdoor Wellness): Evidence-Based Recreational Therapy Curriculum for Adults with Substance Use Disorder

Jamie Peña,
Mentor: Lisa Savarese, Recreation Management & Therapeutic Recreation

About 40-60% of patients who engage in substance use rehabilitation commonly relapse and re-enter treatment after discharging due to a lack of resilience to maintain their sobriety after being reintegrated back into society. Nature therapy engagement for individuals with substance use disorder has been proven to reduce cravings and negative emotions around one's recovery, as well as inspires a positive outlook on one's future. This program focuses on nature therapy for individuals with substance use disorders utilizing resilience theory as the framework to increase resilience. Grounded Resilience through Outdoor Wellness (G.R.O.W.), is an eight-week evidence-based nature therapy program that provides one-hour sessions once a week to increase components of resilience through sessions of forest bathing and hiking. By the end of this program, patients will experience an increase within emotion identification, sense of purpose, connectedness, self-efficacy, and positive coping skills to encourage maintained resilience and reduction of relapse and re-entry into rehabilitation treatment.

A.39 Gentle Journeys: A Recreational Therapy Curriculum Incorporating Equines for Older Adults with Dementia

Lauren Palau
Mentor: Jennifer Taylor, Recreation Management & Therapeutic Recreation

Dementia has affected around 55 million people worldwide and can lead to negative effects on social, psychological, and emotional well-being with symptoms such as agitation, anxiety, and depression. The aim of equine assisted services is to create positive benefits such as social stimulation, accomplishment, enjoyment, and benefits for the behavioral, emotional, and physical aspects of well-being. This curriculum focuses on using equine assisted services to combat the negative effects that dementia has on the older adult population. The Gentle Journeys curriculum utilizes equine assisted services for older adults ages 65+ in the early stages of a dementia diagnosis. The program runs once a week for eight weeks and focuses on the main tenets of self-determination theory: autonomy, relatedness, and competence. The Gentle Journeys curriculum aims to achieve the main benefits of equine assisted services as well as improvement in participants' personal autonomy, peer relatedness, and competence.

A.40 Impact of Intervention Adjustments on Reading Fluency and Student Outcomes

Alexa Hardyman
Mentor: Rob Dixon, Psychology

My project examines how data-based intervention adjustments impact Tier 3 students' reading fluency growth and explores educators' decision-making, using quantitative and qualitative methods to evaluate instructional effectiveness. Reading fluency, the ability to read text accurately and quickly, is a strong predictor of overall reading achievement. For students receiving Tier 3 interventions, inadequate growth often signals a need for instructional adjustment. This project explores whether data-based adjustments improve reading fluency outcomes and how educators make these decisions. A group of students receiving Tier 3 fluency interventions and identified through RTI meetings as showing limited growth (Rate of Improvement < 1.41) were divided into two groups. The groups either received interventions that were adjusted based on progress monitoring data, or received interventions that remained unchanged despite limited growth. Quantitative data analysis will demonstrate whether students with data-based intervention adjustments show higher rate of improvement and stronger fluency growth than other students. Educator interviews are expected to reveal both systemic challenges and effective practices in making instructional decisions. Results may inform district RTI practices and professional development focused on effective use of progress monitoring data.

Session B
8:35 am-9:30 am

B.1 *Tuber pichei nom. prov.*: A New Species of *Tuber* in the Maculatum Clade from North America

Mariah K. Rogers
Co-authors: Véronique B. Cloutier, Ph.D. (Université Laval) and Arthur Grupe II
Mentor: Arthur Grupe II, Biology

Truffle forming fungi, including those in the genus *Tuber* (Tuberaceae; Pezizales; Ascomycota), exemplify the cryptic ecological nature of fungi through their close connections to plants and animals, all while existing entirely underground. All currently-known species within this genus are truffle-forming and form obligate ectomycorrhizal associations with one or more host plants, and are propagated by animal dispersal in nature. Truffles with mature spores begin to emit various strongly aromatic compounds that attract animals who then eat the truffles. In this way, viable spores are able to spread to new locations and are even made more likely to germinate by passing through the digestive tracts of the animals. *Tuber* truffles may be wild foraged or cultivated through inoculation of their host trees. Ecologically sustainable truffle cultivation becomes possible when endemic truffles are grown with compatible hosts in a given region. Here we describe a new *Tuber* species in the Maculatum clade found growing with cultivated hazelnut and in natural settings. The morphology, host associations, and geographic distribution will be discussed.

B.2 Characterizing Color Variation in Garter Snakes (*Thamnophis elegans*) Ecotypes

Lilly Rindahl
Mentor: Jessica Judson, Biology

Color variation is an important trait for survival in animals and can play a role in camouflage, mating, thermoregulation, and signaling others. Despite its proposed importance, the understanding of the genetic basis of color in reptiles is limited. In this study, color analysis was performed to assess color and pattern variation of western terrestrial garter snakes (*Thamnophis elegans)*. Around Eagle Lake, California, there are two ecotypes of garter snakes which differ in life-history traits and coloration. Meadow snakes are typically black with yellow stripes that blend into their mountain meadow habitat and are longer lived. Lakeshore snakes are gray with a tan stripe and mottled patterning that resemble rocks and have a shorter lifespan with larger litters. Hybridization between ecotypes has been documented where the two habitats meet. Photographs of garter snakes were collected from Eagle Lake populations for comparison between individual snakes. I characterized variation in color and patterning for meadow and lakeshore populations, as well as the populations where hybridization is occurring, using photographic software to assess whether snakes in these populations have consistent color differences. Future research will investigate relationships between color and genotypes using whole-genome sequencing to identify causative genes for color in garter snakes.

B.3 Morphometric Effects of Neonicotinoid and Nicotine Exposure in a Chicken Embryo Assay

Dylan Motschenbacher
Co-authors: Cord Brundage (Front Range Community College), Brielle Hachey, Molly Moberg, Calvin Majchrzak, Elizabeth Dietz, and Tia Leen
Mentor: Sumei Liu, Biology

Imidacloprid is a neonicotinoid insecticide designed to target invertebrate nicotinic acetylcholine receptors but may pose risks to vertebrate wildlife. Nicotine is a classic vertebrate neurotoxin that disrupts embryogenesis. We evaluated the comparative developmental toxicity of imidacloprid and nicotine using a chicken embryo assay. Fertilized, specific-pathogen-free (SPF) eggs were injected on embryonic day 0 with saline, imidacloprid (10X or 500X), or nicotine (10X, 100X, 200X, or 500X) and harvested on day 14 of development. Survival, total embryo weight, head circumference, and limb length were compared between treatment groups. Nicotine exposure displayed a threshold effect: survival significantly decreased at concentrations ≥ 200X ($P = 0.048$), whereas morphometric stunting (reduced weight, limb length, and head circumference) was observed only at the highest dose (500X; $P < 0.05$). In contrast, imidacloprid caused significant growth retardation at the low dose (10X), with reduced weight ($P = 0.017$) and limb length ($P = 0.028$) despite high survival rates. The 500X imidacloprid dose was highly lethal (15.8% survival; $P < 0.0001$), though the sole survivor exhibited normal morphometrics, suggesting survivor bias. These findings indicate that imidacloprid induces sublethal developmental delays at lower relative concentrations than nicotine, highlighting potential risks to avian species inhabiting agricultural environments.

B.4 Taxonomic novelties in the genus *Hygrocybe* (Hygrophoraceae) from Western North America

Lauren Ré
Co-authors: Todd Osmundson, Arthur Grupe II, and D. Jean Lodge, Ph.D. (University of Georgia: Odum School of Ecology)
Mentor: Todd Osmundson, Biology

Fungi in the genus *Hygrocybe* are widely known for their vibrant coloration, dynamic ecological roles, and conservation significance. Despite their showy nature, the extent of their global diversity has yet to be catalogued. Over the last 10 years, collaborative efforts between academic and community scientists have contributed extensive, high-quality vouchered collections and DNA sequences of *Hygrocybe* and related taxa. These contributions have extended known biogeographic ranges and elucidated phylogenetic relationships. This research project highlights several species from Western North America that are hypothesized to be new to science.

B.5 Preliminary Macrofungal Biodiversity Survey of Eastern Jamaica

Owen Zecca
Mentor: Todd Osmundson, Biology

There has been very little research to survey the fungal diversity of Jamaica, despite the unique and prolific biodiversity. Additionally, climate change, mining, and deforestation are threatening the ecosystem at an alarming rate. Without adequate baseline data, there is no way to accurately measure biodiversity losses or movement of invasive species. Unique and novel species are being lost without ever being documented. Over the past 7 years, I have been making thorough collection efforts in eastern Jamaica's diverse habitat types. Using microscopy and modern molecular techniques such as DNA sequencing, over 100 operational taxonomic units have been identified. This research will create detailed baseline data that will promote biodiversity conservation and habitat protection. All data produced from this biodiversity research will be posted to publicly accessible online databases such as Inaturalist, Mushroom Observer, and NCBI Genbank to ensure that it will provide open access to all individuals for free. Additionally, the first field guide for Jamaican wild mushrooms has come out of this project to disseminate this information and create a resource for future efforts.

B.6 Using Target Capture to Resolve Species Complexes within the Genus *Aphyllon* (Orobanchaceae)

Kiona Leeman
Mentor: Adam Schneider, Biology

Aphyllon is a genus of parasitic flowers that attach to the roots of other plants to obtain nutrients. There are currently 27 accepted species, and the genus is split into two sections: section *Aphyllon* and *Nothaphyllon*. Species in section *Nothaphyllon* have historically posed significant taxonomic challenges, leading to these members being informally grouped into the *A. californicum*, *A. cooperi*, and *A. ludovicianum* complexes. Previous research suggested that these complexes are the result of a complicated gene history, such as hybridization and/or incomplete lineage sorting (ILS). In this study, we analyzed the phylogenomic data of over 125 *Aphyllon* samples to explore the evolutionary history of these complexes and address taxonomic difficulties. Genes of interest were retrieved from DNA extractions using complimentary RNA baits from the Angiosperms353 probe kit. The retrieved DNA was sequenced and analyzed using various programs, including ASTRAL, which generates a phylogenetic tree while accounting for ILS. Results from these analyses will clarify evolutionary relationships within the species complexes and provide a framework for resolving outstanding taxonomic uncertainties in section *Nothaphyllon*.

B.7 Invasive Bigheaded Carp Movement throughout the Upper Mississippi and Lower Wisconsin Rivers

Elise Bass
Co-authors: Mark Fritts, M.S. (U.S. Fish and Wildlife Service), Jordan Weeks, M.S. (Wisconsin Department of Natural Resources), Jason Freund, and David Schumann
Mentor: David Schumann, Biology

Invasive bigheaded carps (*Hypophthalmichthys* spp.) have had detrimental effects on ecosystem structure and function by outcompeting native fishes. Relatively little is known about the habitat use and movement behaviors of invasive bigheaded carps at current invasion fronts, especially within shallow and sandy, dynamic river systems such as the Lower Wisconsin River (LWR), a large tributary of the Mississippi River. Invasive bigheaded carps were first detected within the LWR in 2011 and have recently been observed moving throughout the system, which may be used for spawning. I will investigate movement behaviors and predictors of movement of bigheaded carps throughout the LWR using acoustic telemetry tagged bigheaded carps and an array of over 30 receivers and gates to identify potential spawning areas and inform future removal efforts. I will also describe the largescale detection range of acoustic transmitters within the LWR by conducting detection range testing at three locations and time periods to represent different river environments and hydrograph changes, which will allow for a better understanding of the detection limits of transponders. Results will allow managers to incorporate detection rates in the LWR into movement models and better manage species of interest in this and similar dynamic river systems worldwide.

B.8 The Palatability of Formulated Diets Intended for Lake Sturgeon Production

Marik Dickson
Co-authors: David Schumann, Eric Strauss, Orey Eckes, M.S. (U.S. Fish and Wildlife Service), and Jadon Motquin, M.S. (U.S. Fish and Wildlife Service)
Mentor: David Schumann, Biology

Effective conservation aquaculture and stocking programs are essential for restoring rare fishes such as Lake Sturgeon (*Acipenser fulvescens*). However, larval propagation requires expensive and labor-intensive feeding regimes to reach sizes that maximize post-stocking survival. Natural diets support growth and survival but increase hatchery costs, limit production capacity, and require intensive care. In contrast, commercially formulated diets reduce feed costs, simplify feeding protocols, and allow hatcheries to rear and stock more fish. Despite these advantages, attempts to transition larval Lake Sturgeon to commercial diets have often been unsuccessful due to poor acceptance, resulting in reduced survival and growth. This study evaluated feeding behavior and palatability across 20 diets offered to larval Lake Sturgeon. Larvae were reared under standard hatchery conditions and fed brine shrimp nauplii (Artemia) for four weeks prior to testing. Feeding responses of individual larvae (n = 180) were observed across treatments including two reference diets (brine shrimp and bloodworms), nine commercial diets, and mixed diets combining brine shrimp with selected commercial feeds. Fish were video recorded for five minutes to quantify interaction frequency and time to first interaction. Brine shrimp had the highest interaction frequency (70%), whereas commercial diets never exceeded 28%. Results suggest diet mixing may improve acceptance of commercial feeds for Lake Sturgeon.

B.9 Movement Behaviors and Survival of Brown Trout in Southwestern Wisconsin

Kyle Kamm
Co-authors: David Schumann and Jason Freund
Mentors: David Schumann and Jason Freund, Biology

Driftless coldwater streams support abundant Brown Trout (*Salmo trutta*) fisheries that are highly pressured and economically important to the region. Knowledge of population parameters (e.g., density, growth rates, age structure, survival) and movement behaviors is beneficial to fisheries managers for setting information-based harvest regulations and assessing recreational fishery status. I will use Wisconsin DNR mark-recapture surveys at eight streams comprising 34 stream reaches sampled for five consecutive years. I will estimate annual population parameters (e.g., sizes, recruitment, growth rates, apparent survival, and inter-stream movements) and identify relationships between these parameters and stream environmental characteristics and harvest regulations. Open-system multi-state Cormack-Jolly-Seber models will predict population dynamic parameters. By estimating Brown Trout population demographics across Driftless Area streams, I will generalize which stream characteristics, population dynamics, and bag limits influence populations and individual movements within a watershed. My results will enable fisheries managers to predict population parameters from stream characteristics, furthering understanding of Brown Trout movement and informing sustainable size and bag limit regulations.

B.10 A Deep Convolutional Neural Network Framework for Biometric Recognition Using Closed-Eye Resting-State EEG Signals

Connor McKellips
Mentor: Rig Das, Computer Science

Electroencephalography (EEG) has gained considerable attention as a biometric modality due to its resistance to spoofing and its ability to capture distinctive neurophysiological patterns unique to individuals. Recent advances in deep learning have significantly improved the performance of EEG-based biometric recognition systems. In this research work, we propose a deep Convolutional Neural Network (CNN) architecture for biometric identification of 37 subjects using closed-eye resting-state EEG signals from the publicly available OpenNeuro dataset (ds005420). The model is trained using cross-entropy loss with a learning rate of 10^(-5)for 2000 epochs. Experimental results show that the proposed CNN achieves perfect classification on the test dataset, indicating the presence of highly discriminative subject-specific EEG patterns during resting-state conditions. To assess the effectiveness of the proposed method, we compare it with several state-of-the-art architectures, including EEG Transformer, EEG Conformer, and a baseline CNN model, using the same dataset, learning rate, and training epochs. The proposed CNN shows improvements of 30.49%, 2.69%, and 2.74% over EEG Transformer, EEG Conformer, and the baseline CNN model, respectively. These results demonstrate that the

proposed CNN provides superior recognition performance while maintaining a simple architecture and stable training behavior.

B.11 AI-Assisted Housing Application & Volunteer Management Portal

Kaaviyashri Saraboji
Mentor: Dipankar Mitra, Computer Science

AI-Assisted Housing Application & Volunteer Management Portal. Nonprofit organizations often rely on manual, PDF-based workflows for processing housing applications and coordinating volunteers, leading to inefficiencies, communication delays, administrative burden, and potential data security risks. This capstone project presents the design and implementation of an AI-assisted web-based housing application and volunteer management portal developed using the MERN stack, including MongoDB, Express.js, React.js, and Node.js. The platform replaces manual processes with a secure 26-step digital application featuring autosave functionality, structured validation, and protected file uploads. An administrative dashboard supports role-based access control, application filtering, checklist verification, decision tracking, and audit logging. A volunteer management module enables opportunity creation and capacity-based signups. To enhance operational efficiency, the system integrates a large language model to provide two AI modules: a public-facing conversational assistant and an administrative AI-generated summary panel that synthesizes structured applicant data to assist review workflows. The AI components provide decision-support only, and final eligibility determinations remain human-driven. The system demonstrates how secure full-stack architecture combined with responsible large language model integration can modernize nonprofit operations while reducing operational and data management risks.

B.12 Lower Extremity Biomechanics Asymmetry in Overground vs. Treadmill Running in Community Runners

Blake Slater, Eryn Flynn, Samantha Saloun, Grace Ellison, Brelynn Scoles
Co-author: C. Nathan Vannatta, PT, DPT, SCS (Emplify Health)
Mentor: Drew Rutherford, Health Professions

The purpose of this study was to examine lower extremity biomechanics and muscle force differences when running on overground compared to treadmill running. The use of treadmill training by therapists is common in clinical settings and may present with inconsistent joint loadings relative to overground training. Prior studies have identified differences in kinematics between overground and treadmill running, warranting further investigation. Fifty-five participants, ages 19-71, were examined in one condition using a Treadmetrix instrumented treadmill (Park City, UT) and a second condition using timing gates and force platforms (Bertec Corp, Columbus, OH) during overground running. Both used a 3-D motion capture system (Motion Analysis Corp., Rohnert Park, CA). Inclusion criteria included running at least 10 miles per week. Exclusion criteria included any lower extremity pathologies, surgeries, or pain limiting activity in the last 12 months, history of patellofemoral joint pain, or any history of serious cardiovascular or medical condition. Future analysis will investigate asymmetries between left versus right lower extremities and age differences influenced by overground and treadmill running. The findings from this study are expected to provide valuable insights into clinical application of treadmill training and its relation to overground training.

B.13 All Abilities All-Stars

Samantha Ganther, Caitlin Caretta, Ashley Hanson, Hailey Carlson, and Kylie Alger
Mentor: Kimberly Servais, Health Professions

All Abilities All-Stars is a proposed five-session program designed to provide adults with disabilities the opportunity to explore a variety of adaptive sports while fostering teamwork, inclusion, and social connection. Engagement in physical activity and social participation is vital for overall health and well-being, yet adults with disabilities have the greatest decline in these areas after the age of 40 compared to typically developing adults (Mihaila et al., 2022). This decline contributes to poorer health outcomes and reduced community participation. Therefore, there is a critical need for accessible education and inclusive opportunities for adaptive physical activity within community settings. The All-Abilities All-Stars is run through Aptiv's Adult Day Services program, and the activities will be housed at the local YMCA in La Crosse, WI, which has been a long-standing community partner of Aptiv for over 20 years.

B.14 Healthy Living in Action

Emma Mickelson, Mathea Diedrich, Madison Wrobleski, Brooke Bremness, and Cory Kaiser
Mentor: Erin McCann, Health Professions

The purpose of the Healthy Living in Action group is to help the residents of Stokke Tower improve their ability to maintain a healthy diet, increase social participation, develop stress management techniques, and explore leisure activities to overall increase their well-being and quality of life. It is necessary to provide OT services to this population because in La Crosse, the poverty rate is 12%, which directly decreases quality of life and increases stress for over a tenth of La Crosse residents. 18.4% of La Crosse residents do not complete any sort of physical activity in their leisure time, leading to sedentary lifestyles that may also decrease quality of life and impact social participation. Additionally, 16.1% of residents do not have access to grocery stores, making healthy meal preparation difficult and creating food insecurity for them and their families. Therefore, a program is needed to address these areas to increase this population's ability to prepare healthy meals, manage stress, find leisure activities, and increase their overall quality of life (Wisconsin Department of Health Services, 2024).

B.15 Pathways To Purpose

Lindsey Tatro, Helena Zajac, Amanda Martin, Hannah Johnson, and Madalyn Williams
Mentor: Kim Servais, Health Professions

Pathways to Purpose is a group designed to promote social participation, leisure exploration, and overall well-being among unhoused individuals at the Salvation Army emergency shelter. Individuals experiencing homelessness commonly face boredom, social withdrawal, hopelessness, and fatigue (Holt-Lunstad, 2024). Although engagement in meaningful activities is a desired coping strategy for managing the stresses associated with homelessness, access to such opportunities is often limited. This program seeks to address that gap by providing education on the benefits of social and leisure participation and offering the materials necessary to engage in these activities.

B.16 UWL Occupational Therapy Neuro Empowerment Group

Alex Ricci, Julia Seidel, Molly Loy, Breelyn Neuroth, and McKenzie Ryan
Mentor: Erin McCann, Health Professions

In Wisconsin, depression is present in 49.3% of individuals living with neurological conditions, compared to the state average of 8.3% (Kazaeipour, 2015). Additionally, studies have found that some of the most important needs for this population include opportunities for social connection and social support (La Pointe et al., 2025). The UWL Neuro Empowerment group is a 5-week community-based program designed to support individuals in the La Crosse community who are living with some form of neurological impairment. The goal of this program is to help enhance the participants' quality of life by engaging them in therapeutic activities that foster social interaction, self-reflection, and group engagement. Each week will consist of one 90-minute session where we will implement occupation-centered interventions such as yoga, Tai Chi, cognitive games, art therapy, and modified client-directed activities to accommodate for any client physical and cognitive need. This group emphasizes the importance of providing our participants with a safe and supportive social setting to allow them to make new connections and build a social support network. By creating a supportive environment and providing our participants with the means to connect, we hope to create opportunities for connection, expression, and empowerment of individuals living with neurological conditions.

B.17 Patellofemoral Joint Forces and Vertical Ground Reaction Force Symmetry during Running in Healthy Individuals

Erin Stecker, Lillian Baker, Kaitlyn Pagenkopf, and Adeline Walton
Co-authors: Drew Rutherford and C. Nathan Vannatta, PT, DPT, SCS (Emplify Health)
Mentor: Thomas Kernozek, Health Professions

Patellofemoral joint (PFJ) pain is common among runners with altered lower extremity mechanics. Asymmetry in vertical ground reaction forces (vGRF) can increase PFJ loading and influence kinematics at the ankle, knee, and hip, relevant to the development and persistence of PFJ pain. PURPOSE: Evaluate asymmetries in PFJ loading, vGRF, and kinematic variables in healthy runners, which may contribute to the etiology of PFJ pain. METHODS: 33 healthy participants (17 females) ran at 7.5 mph on an instrumented treadmill. Lower extremity kinematic (180 Hz) and kinetic (1800 Hz) data

were recorded during stance. A musculoskeletal software model calculated PFJ (PFJRF) loading variables, lower extremity kinematics and peak vGRF symmetry between limbs. Symmetry differences were analyzed using a paired samples t-test and effect sizes. RESULTS: Peak PFJRF rate ($p = 0.004$) was different between limbs. Dominant limb PFJRF rate (97.4 ± 26.9 BW/sec) was larger than the non-dominant PFJRF rate (84.51 ± 17.26 BW/sec) by 14.2% with a medium effect size (Cohen's $d = 0.539$). The non-dominant limb (2.43 ± 0.26 BW) showed a larger vGRF ($p = 0.001$) than the dominant limb (2.38 ± 0.25 BW) by 2.08% with a small effect size (Cohen's $d = 0.196$). Differences were not observed in peak PFJRF nor in all lower extremity kinematic variables. CONCLUSIONS: Asymmetries occurred in peak PFJRF rate and peak vGRF in healthy participants. Findings may be relevant to runners with PFJ pain.

B.18 The Groove and Gather Club

Rachel Gundrum, Natalie Brauer, Maggie Cristoforo, Grace Stockwell, Grace Willmott, and Alexis Lannoye
Mentors: Brandon McCauley and Erin McCann, Health Professions

The Groove and Gather Club coordinators, a team of second year occupational therapy graduate students at the University of Wisconsin-La Crosse, are implementing a five-session wellness program for older adults at Hillview Terrace Assisted Living Facility in La Crosse, WI supported by the RSEL mini grant. The goals of this program are to promote social engagement, physical activity, and cognitive stimulation among participants to address the growing needs of the older adult population. Through sessions focused on yoga, mindfulness, memory education, crafting, music, and team-oriented tasks, the program aims to enhance quality of life and health management in the residents of the Hillview Terrace community.

B.19 Skinfold Measurements and the Influence on Minimal Wrestling Weight in Collegiate Male Wrestlers

Mia Khalil
Co-authors: Andrew Jagim and Ward Dobbs
Mentor: Ward Dobbs, Health Professions

Determination of minimal weight class (MWC) is dependent on the pre-season minimal wrestling weight (MWW) certification. The National Collegiate Athletic Association (NCAA) bases this calculation on a 3-site skinfold measurement. Skinfold values are used to estimate body fat percentage (BF%). PURPOSE: To compare MWW estimates between 3-site and 7-site skinfold assessment of BF%. METHODS: Fifty-five NCAA Division III male wrestlers participated in the current study (Age: 19.6 ± 1.4 yrs; Height: 176.0 ± 6.2 cm; Weight: 79.2 ± 14.1 kg). RESULTS: A dependent t-test revealed a significant difference in BF% between the 3-site (12.8 ± 4.2%) and 7-site (8.9 ± 3.8%) measurements ($t(54) = 45.4$, $p < 0.001$) with a large effect size, Cohen's $d = 6.12$. A significant difference ($t(54) = 24.5$, $p < 0.001$) was also observed between the MWW derived from 3-site (72.1 ± 9.9 kg) and 7-site (75.1 ± 10.6 kg). CONCLUSION: The 3-site skinfold method provided a 3.9% higher mean estimate of BF% compared to the 7-site method. For example, an 81 kg (178.2 lbs.) athlete would be certified at a MWW of either 74.5 kg (164.2 lbs.) or 77.8 kg (171.5 lbs.) if their BF% was 12.6 or 8.7, respectively. Thus, the MWC would be either 74.8 kg (165 lbs.) or 78.9 kg (174 lbs.), an entire weight class lower. This warrants attention toward differences in MWW calculations and their impact on an athlete's descent plan, which may encourage unhealthy weight loss practices.

B.20 Monitoring Energy Availability to Optimize Health and Performance in Collegiate Wrestlers

Connor Mumm and Tom Ritt
Co-authors: Ward Dobbs and Andrew Jagim
Mentor: Ward Dobbs, Health Professions

Wrestlers are faced with high training loads and strict weight manipulation, leading to an increased risk of low energy availability (LEA) and relative energy deficiency in sport (REDs). LEA occurs when energy intake is inadequate to support both normal physiological function as well as exercise demands, leading to decreased performance results, metabolic disruption, and reduced hormonal responses. PURPOSE: The purpose of this study is to evaluate the relationship between markers of LEA (metabolic and endocrine) and physical performance outcomes. METHODS: Approximately 35 male wrestlers participated in this study that spanned through a complete season (preseason, competitive season, and postseason). Athletes completed multiple assessments of body composition, resting metabolic rate, endocrine markers (salivary testosterone), and physical performance tests (e.g., broad jumps, counter movement jumps, grip strength, maximal aerobic speed, and maximal pulling force) throughout the study. A repeated measures correlation will be used to examine any relationships variables throughout the season. RESULTS AND DISCUSSION:

Data collection is complete, but the data analysis is ongoing. This abstract is submitted as a work in progress and will be ready for dissemination prior to the symposium.

B.21 The Association between Perceptual Recovery Status and Reactive Strength Index in Collegiate Women's Track Athletes

Mandie Schwarz and Kyle Comeau
Co-author: Ward Dobbs
Mentor: Ward Dobbs, Health Professions

BACKGROUND: Monitoring performance and perceptual recovery throughout an athletic season can help optimize training load and help reduce injury risk. Reactive strength index (RSI) and perceptual recovery status (PRS) are two variables that have been used in previous literature to help quantify performance and recovery. PURPOSE: The purpose of this study is to evaluate the relationship between PRS and RSI values across time in National Collegiate Athletic Association Division-III Women's Track and Field athletes. METHODS: Approximately 50 athletes on the University of Wisconsin-La Crosse Women's Track and Field team will be recruited to participate in this study. Participants will complete four testing sessions consisting of three drop jumps from a standardized height, single broad jumps, and triple broad jumps, throughout the pre- and competitive season. Participants will also complete daily online questionnaires to quantify their PRS, sleep quality, lifestyle stress, and an aggregate wellness score. RESULTS AND DISCUSSION: Data collection and analysis are ongoing. This abstract is submitted as a work in progress and will be ready for dissemination prior to the symposium.

B.22 Optimizing Exercise Prescription in Conjunction with Glucose-Lowering Medications in Type 2 Diabetes

Kasandra Keller, Olivia Flanagan, and Isaac Lee
Co-author: Steni Sackiriyas
Mentor: Steni Sackiriyas, Health Professions

PURPOSE: Exercise is a cornerstone of type 2 diabetes management (T2DM). However, its impact on skeletal muscle glucose uptake and insulin sensitivity may be influenced by concurrent glucose-lowering pharmacotherapy. Although the effects of both exercise and glucose-lowering medications have been extensively studied, their combined impact has not been explored well. Our study examines the combined effects of aerobic and anaerobic exercise with glucose-lowering pharmacotherapy to optimize glucose regulation and reduce the risk of hypoglycemia. CURRENT EVIDENCE: Current literature was examined to evaluate how glucose-lowering medications, including insulin, metformin, GLP-1 receptor agonists, and SGLT2 inhibitors, interact with exercise-induced changes in skeletal muscle glucose uptake and insulin sensitivity in T2DM. Factors such as medication timing, exercise intensity and duration, hypoglycemia risk, and potential synergistic or antagonistic effects were organized into a conceptual model. This framework underscores the importance of aligning medication pharmacodynamics with exercise-induced changes in skeletal muscle glucose uptake and insulin sensitivity. CONCLUSION: Our study may facilitate healthcare professionals in formulating exercise prescriptions tailored to specific glucose-lowering medications.

B.23 Associations of Urinary Incontinence and VO_2peak in Women

Lauren Franek, Sophie Westervelt, and Taylor Zuzek
Co-authors: Lisa VanWiel and Ward Dobbs
Mentor: Lisa VanWiel, Health Professions

INTRODUCTION: Cardiovascular disease (CVD)in women is of critical public health concern. Aerobic capacity is a well-established modifiable indicator of cardiovascular health. Women with urinary incontinence (UI) have greater CVD risk factors and may reduce intensity of physical activity, thus lowering their aerobic capacity. The purpose of this study is to understand the associations of UI severity and symptom burden with aerobic capacity as assessed by VO_2peak. METHODS: Digital surveys assessed UI severity (Sandvik Severity Index), symptom burden (UDI-6), and demographic information. VO_2peak was assessed using a submaximal cycle ergometer and metabolic cart. Spearman correlation and linear regression assessed the associations of UI severity and symptom burden with VO_2peak. RESULTS: 42 women (48.1 ± 10.4 years) participated. VO_2peak was 25.7 ± 7.6 ml/kg/min. Compared to age and sex-matched norms 48% were below average, 17% average, and 36% were above average. UI severity was not associated with VO_2peak. UI symptom burden had a negative correlation (r: -0.35, $p = 0.03$) and a negative linear association ($b = -0.21$, $p = 0.02$) with VO_2peak. DISCUSSION: Those with greater symptom bother had lower VO_2peak, potentially reflecting avoidance of higher-

intensity activity and subsequent deconditioning. These findings support UI symptom burden as a potential mechanism linking UI and cardiovascular risk in women. Further research is needed to confirm these associations.

B.24 Trends in Pelvic Floor Dysfunction, Influencing Factors, and Co-morbidities in DIII Female Athletics: A Preliminary Study

Maddie Hannan
Co-author: Lisa VanWiel
Mentor: Lisa VanWiel, Health Professions

INTRODUCTION: Pelvic floor dysfunction (PFD) is highly prevalent in trained, nulliparous athletes and poses risks to both performance and lifelong health. Conservative management is successful in treating PFD, but a lack of understanding of the defining characteristics of PFD in athletes makes early detection and prevention difficult. The current study examines the prevalence of PFD, its influencing factors, and co-morbid conditions in DIII collegiate female athletes. METHODS: A digital survey assessed PFD symptom bother (PFDI-20), key indicators of low energy availability (LEAF-Q), MSK pain (VAS), training volume, and demographic information. Prevalence data were assessed using simple frequencies. Logistic regression and linear regression analyses assessed the associations between influencing and co-morbid conditions with PFD. RESULTS: A total of 98 female athletes from five teams at the University of Wisconsin-La Crosse participated in the study. Across all teams, 68% reported urinary incontinence, 12% reported prolapse, and 10% reported fecal incontinence. Influencing factors investigated include low energy availability (LEA), year in sport, and training volume. Co-morbid conditions included back, hip, and pelvic pain. Trends differ based on sport type. DISCUSSION: Results will inform the integration of pelvic floor education and training within athletics and suggest a need to tailor interventions to team needs based on sport demands.

B.25 Associations of Urinary Incontinence and Moderate-to-Vigorous Physical Activity

Lillie Pohjola and Shannon Arthurs
Co-authors: Lisa VanWiel and Ward Dobbs
Mentor: Lisa VanWiel, Health Professions

Introduction: Cardiovascular disease (CVD) is the leading cause of death in women. Moderate-to-vigorous physical activity (MVPA) is a modifiable risk factor for CVD, and emerging evidence suggests that urinary incontinence (UI) is associated with low MVPA and increased CVD risk factors in women. The purpose of this study is to assess the association of UI severity and symptom burden with MVPA to better establish MVPA as a potential mechanism in the association of UI and CVD. Methods: Digital surveys assessed UI severity (Sandvik Severity Index), symptom burden (UDI-6), weekly MVPA (GPAQ), and demographic factors in women ≥ 30 years old. Spearman correlation and linear regression analyzed the correlation and association of UI severity and symptom burden with weekly MVPA. Results: 42 women (48.1 ± 10.4 years) participated. Participants spent 161.0 ± 137.9 minutes per week in MVPA. UI severity and symptom bother were negatively correlated with weekly MVPA (r: -0.32, $p = 0.04$; r: -0.33, $p = 0.03$, respectively). No linear association was found ($p > 0.05$ for both). Discussion: Despite significant moderate negative correlations between UI severity, symptom burden, and weekly MVPA, linear regression models were not significant. The small sample size and substantial variability in MVPA may have limited statistical power. UI may influence health behaviors relevant to cardiovascular risk. Further investigation of MVPA as a potential mechanism linking UI and CVD in women is needed.

B.26 Expression of NmpR-Dependent Promoters in *Myxococcus xanthus* under Hypoxic Conditions

Anna K. Jensen
Co-author: Daniel Bretl
Mentor: Daniel Bretl, Microbiology

Myxococcus xanthus is a soil bacterium with extensive cooperative social behaviors, including type IV pili (T4P)-dependent motility, also known as social (S) motility. Other complex behaviors, like multicellular development and predation, require S-motility. The NmpRSTU multi-component regulatory system is involved in *M. xanthus* T4P-dependent motility and has also been implicated in regulating genes for oxygen utilization. Notably, *M. xanthus* is an obligate aerobe, suggesting that gene regulation by NmpRSTU may be important for survival in low-oxygen environments. To further investigate NmpRSTU gene regulation, *in vivo* transcription from NmpR-dependent promoters was analyzed using a *lacZ* reporter in hypoxic conditions. Preliminary results indicate that the promoter for *mxan_1578* was significantly upregulated after five and 20 hours in hypoxia. A conserved domain search predicts that *mxan_1578*

contains an oxygen-binding di-iron protein (ODP) domain, with a conserved di-iron-binding site consistent with structurally characterized ODP proteins. This domain may have roles in oxygen and iron sensing. Two other promoters, *mxan_4236* and *mxan_5532,* also showed an increase in expression over time in hypoxia. Together, these findings provide initial insight into genes that may contribute to the *M. xanthus* response to low oxygen and further investigation will aim to clarify the specific roles of these genes.

B.27 Analysis of Uropathogenic *Escherichia coli* Clinical Isolates from a Patient with Recurrent Urinary Tract Infections

Brooke Sill
Co-authors: William Schwan, Paul Schweiger, William Agger, M.D. (Emplify Health), Arick Sabin, M.D. (Emplify Health), and Gretchen Liebl
Mentors: William Schwan and Paul Schweiger, Microbiology

Worldwide, over 400 million people suffer from urinary tract infections (UTIs) each year. With widespread antibiotic resistance, recurrent UTIs (RUTI) have become a health and economic burden. The primary etiologic agent of UTIs is uropathogenic *Escherichia coli* (UPEC). This study began with the preliminary characterization of the first clinical UPEC isolate obtained from a patient with RUTIs that has sought medical care at Emplify Health in La Crosse, WI. The isolate, GLMC BS-1, underwent antimicrobial susceptibility testing, phylogroup typing, and whole genome sequencing (WGS). E-test analysis using fosfomycin and azithromycin showed GLMC BS-1 had minimum inhibitory concentrations of 0.38 μg/ml and 2.0 μg/ml, respectively. WGS performed using Illumina and subsequent bioinformatic analysis revealed GLMC BS-1 typed as a D phylogroup, O86:H2 serotype, and subtypes as an ST349 clonal complex. Further bioinformatic analysis suggested GLMC BS-1 is multidrug-resistant. Prospective work will include a comparison between the initial clinical isolate, GLMC BS-2 and GLMC BS-3, a second and third isolate retrieved from subsequent RUTI infections after failed antibiotic treatment. Comparative work will be centered around strain similarity, genetic composition, and biofilm formation strength.

B.28 Generative AI's Effect on Preservice Teachers' Lesson Planning Self-Efficacy

Sarah Jantzen
Co-authors: Angela Goethel and Rob Dixon
Mentors: Angela Goethel and Rob Dixon, Psychology

The increasing integration of generative artificial intelligence (AI) in education has significant implications for teacher training and instructional quality. While AI tools like ChatGPT enhance efficiency and creativity in lesson design, their use may reduce opportunities for preservice teachers to develop essential planning competencies. This study examines how generative AI usage affects preservice teachers' self-efficacy in lesson planning. A sample of 11 preservice teachers from a Midwestern university completed a survey measuring AI usage frequency and instructional self-efficacy.

B.29 The Impact of Teaching Experience on Self-Care Practices among Educators

John Benish
Mentor: Angela Goethel, Psychology

This study examines how years of teaching experience influence self-care practices among K-12 educators. Using a mixed-methods approach, results find that teachers with less than 18 years of experience reported higher self-care scores in the areas of "Professional Support" compared to those with 18+ years of experience. Qualitative data revealed unique challenges across career stages. Findings suggest that targeted, stage specific support can enhance teacher well-being. Implications include integrating self-care into professional development and leveraging school psychologists to promote sustainable wellness practices and reduce teacher burnout.

B.30 Understanding the Feedback Loop between Burnout and Classroom Engagement

Lela Brashi
Co-authors: Angela Goethel and Jocelyn Newton
Mentors: Angela Goethel and Jocelyn Newton, Psychology

Teacher well-being is a critical component of student engagement and classroom functioning. As educational demands increase, teacher burnout may negatively affect the classroom and student participation in correlation. This study examines the relationship between teacher burnout and student engagement through the lenses of social-emotional competence and attachment theory. Burnout will be measured using the Burnout Assessment Tool (BAT), which assesses exhaustion, mental distance, emotional impairment, and cognitive impairment. Using a cross-sectional design, middle school teachers with varying experience levels—including novice teachers (one year or less) and veteran teachers (ten or more years)—will complete the BAT and provide perceptions of student engagement. Independent samples t-tests will examine differences in burnout between novice and veteran teachers, and correlational analyses will explore relationships between burnout symptoms and student engagement. It is anticipated that veteran teachers will report higher burnout levels and that greater burnout will be associated with lower student engagement. Findings may also suggest a feedback loop in which burnout and disengagement reinforce one another. Despite limitations such as convenience sampling and self-report measures, this study aims to inform school psychologists and school teams about the importance of supporting teacher well-being to promote healthier classroom environments and stronger student engagement.

B.31 Exploring School Climate Impact on Teacher Resilience and Well-Being

Alexis Ashe
Mentors: Dan Hyson, Psychology

This study examined the relationship between school climate, teacher resilience, and well-being among educators in Midwestern public schools. Grounded in prior research on self-efficacy and burnout, the study explored how contextual (school climate) and individual (self-efficacy, burnout) factors interact to influence teacher well-being. Teachers completed a Qualtrics survey including the Organizational Health Inventory, Maslach Burnout Inventory–Educators Survey, and Teachers' Sense of Efficacy Scale. Pearson correlations were used to analyze relationships among variables. Results indicated that a more positive school climate was associated with lower emotional exhaustion, higher professional competence, and stronger teacher self-efficacy, particularly in student engagement and classroom management. The morale subscale showed strong associations with both burnout and self-efficacy, highlighting its importance in overall well-being. Leadership characterized by care and support was linked to reduced burnout, while strong academic emphasis was associated with increased teacher confidence and purpose. Qualitative findings emphasized the role of collaboration, communication, trust, and supportive leadership in positive climates, while negative environments were associated with poor support, low trust, and structural stressors. These findings highlight the importance of school climate in supporting teacher resilience and informing preventative, school-wide interventions.

B.32 Ignite Learning Potential Through Tier 1 Executive Functioning Instruction

Lexy Gorges
Co-author: Dan Hyson
Mentor: Dan Hyson, Psychology

As classroom demands increase, students with impaired executive functioning skills risk behavioral, social, and academic challenges. The present study investigates the implementation of an executive functioning curriculum for elementary school students (K-4) at the Tier 1 level. By examining pre- and post- intervention data using teacher and student ratings of students' executive functioning, the study will evaluate student gains in skills like self-regulation, cognitive flexibility, and organization. Qualitative feedback from implementers of the curriculum will provide depth and further clarification of the results.

B.33 Comparing School Staff Perceptions of Universal Mental Health Screening

Haydn Guns
Co-author: Dan Hyson
Mentors: Dan Hyson, Psychology

School psychologists are crucial in developing and implementing services that enhance mental and behavioral health (NASP, 2020) Universal mental health screening (UMHS) can play a vital role in identifying at-risk students early, yet implementation in schools remains limited. Only about 12.8% of school districts have policies on mental health screenings. (McCabe et. al., 2024). This study surveyed K–5 school staff across 2 Midwest schools within the same district to examine differences in perceptions of UMHS between classroom-based and support/administrative staff to promote better consultation regarding UMHS implementation.

B.34 School Resource Officers and Student Perceptions of School Climate

Kaya Hanson
Co-author: Dan Hyson
Mentor: Dan Hyson, Psychology

As schools increasingly turn to School Resource Officers (SROs) to promote safety, it is important to understand how their presence impacts students. While SROs are seen by many adults as a protective measure, student experiences may vary based on how often and in what ways they interact with these officers. This study explores how the presence of SROs impacts student perceptions of school climate, with a focus on whether these perceptions differ based on the frequency of interaction. Understanding these student experiences is essential in informing the decisions made by school psychologists and administrators in creating safe and supportive learning environments.

B.35 Teacher Perceptions of and Self-Efficacy for Implementing Student Regulation Activities

Emma Roehl
Co-authors: Dan Hyson
Mentors: Dan Hyson, Psychology

This study explored K–12 teachers' perceptions of and self-efficacy for implementing classroom-based regulation strategies such as mindfulness, movement breaks, and emotional check-ins. Participants completed a survey measuring attitudes toward evidence-based practices and confidence in applying regulation strategies. Findings underscore the importance of teacher beliefs in successful implementation and suggest targeted support is especially needed for early-career teachers and those in upper grade levels. Results inform school psychologists' efforts in consultation, professional development, and intervention planning aligned with the NASP Practice Model.

B.36 The Unspoken Influences That Shape ELL Belonging

Gabriela Nelson
Co-authors: Rob Dixon and Angela Goethel
Mentors: Rob Dixon and Angela Goethel, Psychology

This study examined differences in sense of belonging– related indicators between English Language Learner (ELL) and non-ELL students within a rural school district. Using student self-report mySAEBRS screening data, this study compared social, academic, emotional, and level of risk between ELL and non-ELL students. Results provide important context for understanding how experiences of belonging may differ for ELL students in rural settings and highlight the need for targeted, culturally responsive practices to inform future supports and interventions.

B.37 Predicting Teacher Burnout through Coping Self-Efficacy

Maria Buckles
Mentor: Jocelyn Newton, Psychology

Teacher burnout continues to impact educator retention, student outcomes, and school climate. This study examines how teachers' coping self-efficacy—defined as confidence in managing work-related stress—predicts levels of burnout. Findings will inform how school psychologists can promote teacher well-being through low-cost, proactive supports.

B.38 The Hidden Link between Body Image and Academic Performance

Enya Szymanski
Mentor: Jocelyn Newton, Psychology

Body image is a critical psychological factor influencing students' academic performance. Growing research highlights that students' self-perceived appearance can directly affect their academic performance. For school psychologists, this connection is essential to recognize. As professionals responsible for supporting both the mental health and academic development of students, it is imperative that school psychologists are equipped to identify and address body image concerns. According to the NASP Practice Model (2020), Mental and Behavioral Health Services (Domain 4) details interventions aimed at addressing students' emotional and behavioral needs. Further, the model also outlines Prevention and Responsive Services (Domain 7), which emphasizes the importance of school psychologists' involvement in designing and implementing prevention programs when mental health concerns arise. The relationship between body image and academic achievement stresses the importance for school psychologists to integrate body image awareness into school-based supports to promote student well-being and advance educational and mental health equity.

B.39 Hearing Their Story: Narrative Tools for Nursing Student Support

Rikki Klassy
Mentors: Hanna Dovalina and Adele Lozano, Student Affairs Administration

Higher education professionals (HEPs) working in nursing programs often lack the contextual understanding needed to effectively support nursing students, whose educational experiences differ markedly from traditional academic pathways. Nursing students navigate clinical rotations, high-stakes licensure preparation, cohort-based lockstep progression, and emotionally demanding patient encounters—pressures that generalist HEPs may be ill-equipped to recognize or address. This disconnect can result in mismatched support, student attrition, and HEP impostor syndrome. Given the national nursing shortage and a 20% average attrition rate in nursing programs, effective institutional support is critical. This project proposes the Narrative Bridge Program, a three-component professional development intervention grounded in narrative inquiry, narrative empathy, and transformative learning theory. The program includes a Tiny Stories collection campaign gathering 55-word narratives from students and staff, an annual Story Slam and Gallery Walk event to foster community and empathy, and a Canvas-based onboarding and professional development module integrating collected narratives with structured reflection activities. Drawing on established narrative medicine practices and evidence from systematic reviews demonstrating narrative techniques' impact on empathy, reflection, and professional growth, this program adapts these tools for non-clinical HEPs.

B.40 Paraprofessionals as Management Systems: The Value of Quality vs. Quantity

Amy Schmidt
Mentors: Rob Dixon, Psychology

The purpose of this study is to determine whether a single session of Crisis Prevention Institute training amongst paraprofessionals can increase self-efficacy enough that further training in the area of behavior management is not necessary. This data will be used to support next steps and further needs to support a high-quality paraprofessional onboarding system to develop special education systems that are filled with exceptionally trained paraprofessionals.

2025 RECIPIENTS OF GRADUATE RESEARCH GRANTS

2025 RECIPIENTS OF THE GRADUATE RESEARCH, SERVICE, AND EDUCATIONAL LEADERSHIP AWARDS

Name	Program or Department	Faculty Sponsor	Title
Jane Addams	Biology	Anita Davelos	Effects of Altered CO_2 on Secondary Metabolite Pigments in Dye Plants: An Ethnobotanical Perspective on Climate Change
Adam Aker	Biology	Cord Brundage	Identifying Correlations between Surgical Wound Healing Time, and Skin Moisture, Elasticity, Erythema, Sebum and Firmness Levels
Kalie Butcher	Microbiology	Paul Schweiger	Influence of GOX1969 on the Growth and Bioproductivity of *Gluconobacter oxydans*
Jack Johnson	Biology	Todd Osmundson	Biogeography and Biodiversity of Hawaiian Fungi
Mikayla Johnson	Cell Biology	Alder Yu	Investigating the Role of the Gut Microbiome in Host Circadian Rhythms Using *Drosophila melanogaster*
Kiona Leeman	Biology	Adam Schneider	Aphyllon Assembly: Elucidating the Phylogenetics of a Genus of Non-photosynthetic Angiosperms Using the Angiosperms353 Probe Kit
Lauren Re	Biology	Arthur Grupe II	Novel Species and Taxonomic Revisions in the Fungal Family Hygrophoraceae from Western North America & the Hawaiian Islands
Mariah Rogers	Biology	Arthur Grupe II	True Truffle (Tuber) Species Diversity Survey in the Upper Midwest of North America and Prospects for Inoculation of Hazelnut (Corylus) Trees with Locally Native Culinary Truffles
Evan Sirianni	Biology	David Schumann	Competitive Feeding Interactions of Coldwater Stream Fishes: Mottled Sculpin (*Cottus baridii*) and Slimy Sculpin (*C. cognatus*)
Kassandra Zimmerman	Biology	Eric Strauss & Markus Mika	Characterization of Microplastics in Avian Digestive Tracts
Jared Johnson	Athletic Training	Naoko Giblin	Examining the Relationship between Dynamic Quadriceps Angle, Ground Reaction Forces, and Patient Oriented Outcomes in Heathy and Surgically Repaired Knees
Paul Kaiser & Madison Page	Physical Therapy	Megan Litster & Ward Dobbs	Menstrual Cycle Effects on Fatigue Response to Vertical Jump Testing in College Female Athletes: A Quasi-Experimental Study
Connor Mumm	Physical Therapy	Ward Dobbs	Monitoring Energy Availability to Optimize Health and Performance in Collegiate Wrestlers
Brooke Sill	Clinical Microbiology	William Schwan	Comparative Analysis of a Uropathogenic *Escherichia coli* Clinical Isolate from a Patient with Recurrent Urinary Tract Infections
Owen Zecca	Biology	Todd Osmundson	A Comparative Fungal Biodiversity Assessment of Jamaica's Blue Mountains and Lowland Moist Forests

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ABSTRACT BOOK EDITORS

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