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CERCA Oral Presentations

Education Issues

Menominee Room
Wednesday, May 3
9:00 – 9:50 am

Recruiting and Retaining Teacher Candidates of Color at Predominantly White Institutions
Amerrita Chhunn, Yer Lor, Jackson Yang, and Pang Kou Yang
Faculty Mentor/Collaborator: Anjela Wong

This research aims to examine the services and programs for students of color attending Predominantly White Institutions (PWIs), particularly those pursuing education degrees or interested in doing so. PWIs have a lack of students of color enrolled in teacher education programs (TEPs). In 2014, for the first time, over 50% in U.S. public schools are students of color. However, only 18% of our teachers are teachers of color. The racial disparity between public school teachers and their students prompts the need to examine how PWIs and TEPs recruit and retain teacher candidates of color. This project will focus on teacher candidates of color at a Midwest four-year public university’s teacher education program. The following two areas are examined: 1) how TEPs recruit and retain students of color who are interested in or pursuing teacher education; and 2) what role and impact do university-wide services and faculty mentoring affect these teacher candidates throughout their educational career. We will utilize qualitative methods and Critical Race Theory, because we acknowledge and value the experiences and stories of our participants. Future analysis of this research includes recommendations on recruiting and retaining teacher candidates of color in TEPs at PWIs.

The Effects of Tracking in Schools
Jack Marchiafava, Brenna Hughes
Faculty Mentor/Collaborator: Jennifer Harrison

The process of educating someone from Kindergarten through high school graduation in the United States is a long and often arduous process. As students come and go from elementary to middle to high school, they are often placed on “tracks” to properly challenge and pace them. However, current research reviewed for this project demonstrates there is a bias involved when these students are placed on said tracks. Race, socioeconomic status, and gender have all been found to effect the decision of whether a student is gifted or a slow learner. Unfortunately, as the reviewed research shows, tracking tends to disproportionately favor white, wealthy, and male characteristics over all others. As findings further show, these effects come from a multitude of factors, dating back to the formation of mathematics, and its integration with other cultures. By reviewing previously conducted studies and experiments, we explore many of the root causes of this problem, the ways in which it affects today’s society, and how we as a nation can move forward to level the playing field.
Stress and Time Management in High School Students  
Cole Pankratz  
Faculty Mentor/Collaborator: Christopher Hlas

We’ve all been there, but how many of us have thought about it? Stress. There are always newfound responsibilities and finally a sense of independence which makes way for budding social lives. What influences stress levels, specifically for high school students? Our study looks to find correlations between perceived student stress levels and their time management with family, school, and social lives. Initially looking through previous research, we examined studies that were geared towards specific groups such as gifted students. To obtain data on students as a whole, we created and administered repeated daily surveys to students from a local high school for ten days during early February. Our goal for this project is to obtain sufficient evidence through data analysis to find a correlation between stress in these students and their daily time commitments to help students find a healthy balance between these factors in the future.

Climate Change and Perception

Ho-Chunk Room  
Wednesday, May 3  
9:00 – 9:50 am

Developing a Scoring and Group Classification System of Acceptance/Knowledge of Climate Change Realities for Citizens in the United States, China and Vietnam  
Ryan Hammer, Hunter Hermes, Austin Holmes  
Faculty Mentor/Collaborator: Eric Jamelske

With mounting scientific evidence regarding the realities of climate change including causes and consequences, the international/global importance of this issue cannot be overstated. Significant research has assessed public climate change views in developed countries including the United States and Europe. However, much less is known about public climate change views in developing countries. Surveys were conducted of American (4,927), Chinese (2,629) and Vietnamese (1,496) citizens in 2015-16 to provide comparisons of how citizens in developed/developing countries view climate change. We develop a scoring/group classification system based on responses to survey questions. This process yields an easily understandable metric for comparing acceptance/knowledge of basic climate change realities across citizens in these three countries. Overall, our results show significantly greater acceptance/knowledge of climate change realities for citizens in Vietnam and China compared to the United States. Vietnamese citizens have the highest knowledge/acceptance scores largely driven by higher concern and greater understanding of the scientific consensus on anthropogenic climate change. Additionally, we find significantly more variation in American climate change acceptance/knowledge compared to both Chinese and Vietnamese citizens. Lastly, political ideology in the United States is also related to acceptance/knowledge scores with conservatives having lower scores.
Using Climate Change Acceptance/Knowledge Scores and Group Classifications to Assess Public Support for an International Climate Treaty and Willingness-to-Pay for Climate Change Mitigation in the United States, China and Vietnam
Dylan Wilson, Kayla Coonen, Cora Cornett
Faculty Mentor/Collaborator: Eric Jamelske

Climate change is the most important environmental/societal issue facing our world today. Because of the global causes/consequences of climate change, international cooperation is essential in developing, implementing and financing successful mitigation policy action. Moreover, public support for action around the world will likely be a significant determining factor regarding if/when climate change mitigation policies will be enacted. Using survey data collected in the United States (4,927), China (2,629) and Vietnam (1,496) in 2015-16 we assess public support for an international climate treaty. Our results show significantly more support in Vietnam and China compared to the United States. Moreover, support for a treaty in all three countries declines significantly if it is known that either the United States and/or China will not sign/participate in the treaty. We also examine public willingness-to-pay costs associated with climate action. Our results show a significantly greater willingness-to-pay among Vietnamese and Chinese compared to Americans. We also find that acceptance/knowledge of climate change realities is positively correlated with support for an international treaty and willingness-to-pay mitigation costs in all three countries. Additionally, political ideology is a significant factor in the United States with conservatives showing less support for an international treaty and lower willingness-to-pay mitigation costs.

Andy Nguyen, Ashley Pike, Anastasia Rauland
Faculty Mentor/Collaborator: Eric Jamelske

Given the scientific consensus on climate change causes/consequences, global action to address this issue is paramount. China and the United States, as the world’s largest economies and greenhouse gas polluters, share prominent roles in the development/implementation of future international climate change mitigation strategies. However, public views regarding climate change are diverse/complex and can be uninformed/misinformed. To better understand climate change views in these two important countries we use survey data collected in the United States (N= 4,927) and China (N= 2,629) in 2015 analyzing responses to the question “what comes to mind when you hear the words ‘climate change’?” Our results show that both Chinese and American respondents frequently mention ice/glacier melt, sea rise, hot/warm, temperature, weather, pollution, natural, carbon dioxide and greenhouse gas/effect. Chinese respondents were more likely to mention vehicles and industry, while Americans mentioned fossil fuels more. Additionally, US respondents had significant mentions of science and politics compared to no mentions in China. Neither country mentioned media/news with any frequency. Lastly, comments regarding if climate change is real/happening were only present among Americans. Further examination of the US data reveals that “naysayer” and “alarmist” comments were correspondingly isolated among respondents with low/high climate change acceptance/knowledge score respectively.
Math Education

Menominee Room
Wednesday, May 3
10:00-10:50 am

How to Integrate Technology into the Mathematics Classroom
Breahan Lynch, Courtney Patri
Faculty Mentors/Collaborators: Ryan Harrison, Jennifer Harrison

How to Integrate Technology into the Mathematics Classroom addresses technology-enhanced pedagogical content knowledge, how teachers can integrate technology within their classrooms, and why technology is beneficial for student learning and comprehension. This collection of topics were chosen because of a perceived hesitance for teachers to work with technology and teach in a way that promotes technology-use within the classroom. In order to carry out this research exploration, four scholarly education articles were reviewed and synthesized. Due to an ever-evolving push towards using technology within education, it is important to explore the effect technology has on student comprehension, the current educational practices in place to help future educators, and how specific types of technology can be integrated into the mathematics classroom. In order to be successful, educational courses preparing future teachers should provide knowledge about how to incorporate technology into specific topics and provide content specific technologies to be used within the classroom. Educators need to effectively use technology as a learning tool to better the learning outcome for all students. Using technology as a learning tool establishes the opportunity to service a variety of learning styles and student needs. Establishing technology use within the classroom can be beneficial for all.

New Math Era versus Common Core
Cassie Sechtig, Nicole Bouzek
Faculty Mentors/Collaborators: Jennifer Harrison, Ryan Harrison

The aim of our research project was to identify connections between and criticisms of the New Math era (1950’s-1970’s) and the current Common Core Math with a focus on better understanding how to combat the struggles currently facing Common Core. As education majors who will be using Common Core standards in our classrooms, this topic is critical in our future profession. Through our comparison we were able to identify similarities that could potentially affect the outcome of Common Core, an idea that has not been explored to much depth at this point. We conducted our research by first finding the connections between New Math and Traditional Math in order to create a baseline. We then connected Traditional Math to Common Core. Finally, we were able to compare New Math to Common Core through the baseline connections we made between both of them and Traditional Math. Our research shed light on the many criticisms of Common Core and how these can be addressed, as they were in the past when New Math was rejected.
Teacher Influences on Mathematics Attitudes and Beliefs
Taylor Saunders, Auna Nelson
Faculty Mentors/Collaborators: Jennifer Harrison, Ryan Harrison

How do teachers influence students’ beliefs and attitudes about mathematics? This is an important topic because many people, adults and students, think of mathematics from a negative perspective. The goal of this research was to look into what may be contributing to this negative perspective. The project examines why many of today’s students dislike mathematics. After reviewing many scholarly articles and compiling the information, we were able to gain insight into how teachers are influencing student attitudes and beliefs about mathematics. We concluded that there is more than just one factor impacting students’ attitudes and beliefs about mathematics. Some of those include stereotypes, misunderstood concepts, inconsistent teaching strategies, and relevance of content to students’ lives. Teachers’ increased awareness of these factors is an important step toward improving society’s attitude toward mathematics.

Multicultural Identities

Menominee Room
Wednesday, May 3
12:00-12:50 pm

A Map for Resistance: Double Consciousness in Nancy Prince’s Travel Writing
Jamie Utphall
Faculty Mentor/Collaborator: Stephanie Farrar

While some scholars have read the 1850 travelogue *A Narrative of the Life and Travels of Mrs. Nancy Prince* as simple, I propose a complex double consciousness can be read throughout. Born free in Massachusetts in 1799, Gardner married Freemason and sailor Nero Prince in 1824, and joined him on Russian court in St. Petersburg, where she witnessed the Decembrists’ Revolt. She returned to America in 1840 but soon left for missionary work in Jamaica. In her time, Prince was regarded as a black woman of prominence, yet the agency she developed traveling abroad could never fully return home with her. Today she remains an unsung heroine of antebellum Black female mobility. In *The Black Atlantic: Modernity and Double Consciousness*, Paul Gilroy acknowledges “gender [as] the modality in which race is lived,” yet his arguments on the hybrid legacy of the Atlantic Slave Trade lack sustained discussion and examples involving the implications of gender. Thus, I propose a rereading of Prince’s *Narrative* to highlight her call for Black and white audiences of the time to prepare for more active resistance, in particular in reaction to the passing of the Fugitive Slave Law of 1850.

Hmong Diaspora in Australia: Language Assimilation, Cultural Identity Influence through Education, Religion, and Academic Success
Jackson Yang, Mizone Vue, DJ Yang
Faculty Mentor/Collaborator: Selika Duckworth-Lawton

Our research investigates how cultural geography influences the Hmong identity for Hmong people living in Australia. Each individual student researcher dedicated their sub research to four topics: language assimilation, Australian education system from a Hmong perspective, Hmong Australian religious
practices compared to Hmong Americans, and Australian education system supporting or denying Hmong students. Investigation was done through phenomenology research method which includes focus group and personal interviews. This research looks to examine the preexisting literature of the Hmong people living in Australia to give student researchers a broader context to the ways of life of the Hmong people. Results are incomplete and requires further investigation and interactions with Hmong Australians. Knowledge obtained by student researchers’ experiences will contribute to the preexisting information of Hmong Australians. Hopes of future research include voices and experiences of younger generations, retention of Hmong language and religion, and higher educational attainment.

The National Museum of African American History and Culture: A Museum 100 Years in the Making
Sarah Beer
Faculty Mentor/Collaborator: James Oberly

The Smithsonian Institution has been in recent news for one momentous reason: they have opened a new museum commemorating African American history. Beginning in 1916, several actions took place in Congress to introduce legislation that would create a museum, but it wasn’t until 2003 that President George Bush finally passed the legislation to create the National Museum of African American History and Culture. My project centers on a capstone paper which studies the complex history, early reviews, and content of the museum while also including my personal review: as a public history student I pay close attention to the narrative of the museum and how it is presented. I have utilized careful analysis to write a congressional history of the NMAAHC, and field work to write my review: a research grant allowed me to travel to Washington D.C. to view the museum. Through this experience I found the museum to be overwhelming and lacking in organization and logical layout, though it does offer the visitor glimpses at priceless pieces of history and a unique narrative. NMAAHC is important because its creators have overcome every possible hurdle to create it and it stands as the government’s view on African American history.

Preparation for Professional Life

Menominee Room
Wednesday, May 3
1:00-1:50 pm

Evaluating Reflective Artifacts through the Use of the Developmental Continuum of Reflection on/for Action (DCRo/fA)
Stephanie Larson, Megan Ponty, Abby Williamson
Faculty Mentor/Collaborator: Kirstin Rossi

This study was conducted to validate the effectiveness of the Developmental Continuum of Reflection-on/for Action Rubric (DCRo/fA Rubric) previously created by Thorsen and DeVore (2013). The goal of the study was to test the validity of the DCRo/fA Rubric when used to determine the level of reflection demonstrated by individual teacher candidates through two mediums: written reflection and digital storytelling. The theory of reflection is discussed, as well as the process to reach the highest level of reflection in regards to teaching practices in the educational field; pedagogical tact with passionate creed.
Secondly, this study describes the purpose of the DCRo/fA Rubric, the process the study participants engaged in when learning to use the Rubric, the methods of using the Rubric to analyze 16 reflective artifacts, and the results the study produced. The DCRo/fA Rubric proved to be an effective tool when determining the level of reflection a teacher candidate has achieved through written reflection and/or reflective digital storytelling, with the three study participants agreeing on overall rating on 14 of the 16 artifacts (87.5% success rate). Lastly, this article discusses limitations of the DCRo/fA Rubric, as well as suggestions for further research regarding teaching reflective practices, and how to refine one’s own reflective skills to achieve deep level reflection on/for action.

**Evaluating the Effects of Instructional Interns on Faculty and Students**

**Ashley Crumb, Kelsey Weber**  
**Faculty Mentor/Collaborator: Abby Hemmerich**

Instructional interns, similar to teaching assistants, play a major role in Communication Sciences & Disorders undergraduate courses. Previous research has examined the effects of this hands-on, mentored teaching approach on the interns themselves. However, the impact on the faculty teaching the courses and the students enrolled in the courses has not yet been assessed. Two student researchers have designed a two-phase study to examine the effects of the instructional interns on both faculty and students. In phase one, a short survey was sent to all faculty in CSD and all undergraduate students in CSD to gather information about how instructional interns participate in and out of the classroom. Phase two will include a focus group of faculty and a focus group of students to gather qualitative data regarding the impacts of instructional interns. These focus groups are scheduled for early March. Both positive and challenging ways that instructional interns are involved in the courses will be discussed and may provide a model for other disciplines to consider ways to assist faculty workload and student learning.

**Successful Leadership: Does Gender Matter?**

**Marissa Leners**  
**Faculty Mentor/Collaborator: Emily Elsner Twesme**

What makes women successful leaders? This presentation will cover what women and men can do to combat the current barriers that women encounter. The topics covered will include:
- secondary-bias
- wording of job descriptions and how it impacts women applying
- leadership style differences between women and men and how effective they are
- specific behaviors genders can display to be a successful leader.

The focus of the presentation will be on effective behaviors for women in careers that are predominately male. This project’s research has discovered that women who are leaders in male-dominated professions must be “bolder.” Being “bold” encompasses challenging standard approaches, striving for continual improvement, and energizing others to take on challenging goals. In all professions, women and men can be more successful leaders if they exhibit the behaviors that research has found to lead to success. This presentation will summarize the findings and provide a toolbox of leadership ideas for women and men entering the workforce. There will be suggestions for how to minimize the secondary bias that currently occurs in most organizations and a discussion about what audience members can do to be successful regardless of their gender.
Mental and Physical Health

Menominee Room
Wednesday, May 3
2:00-2:50 pm

Understanding Depression and the Experiences of Other People
Alexander Woodworth
Faculty Mentor/Collaborator: Matthew Meyer

In this study I aimed to understand how depression modifies the experience of other people and what these modifications suggest about ‘normal’ social experience. Many philosophers, such as Maurice Merleau-Ponty and Matthew Ratcliffe, have looked at contexts of psychopathology and used them to further understand everyday experiences. I performed a survey of this literature with a specific emphasis on the intersubjective experiences and phenomena of communication. Using Ratcliffe’s analysis of depression and borrowing from philosophers who discussed the experiences of other people – primarily Martin Heidegger and Merleau-Ponty – I then considered what it meant to communicate and understand other people in a depressed state of being. The analysis revealed that, in some cases of depressed experience, the possibilities of communicating with and understanding other people was severely limited, furthering the pathological condition of individuals suffering from depression. Furthermore, these cases of depression suggest that properly communicating with other people could frequently demand the acknowledgement of not fully understanding their experiences.

Impact of Community Fitness Program on Health Indices among Young to Older Adults
Megan Dobbertin
Faculty Mentor/Collaborator: Saori Braun

With obesity and cardiovascular disease on the rise, lifestyle choices must be evaluated to determine how to decrease certain health threats in adults. Current evidence suggests that 72 minutes of moderate-intensity physical activity per week benefits the fitness levels in sedentary adults. The Community Fitness Program at UW-Eau Claire Department of Kinesiology offers a structured exercise program that provides full health and physical fitness assessment and exercise regimen to the community members. To examine the impact of structured exercise programming on health indices of young to older adults in the community. The study will compile existing data from previous semesters that include health indices (e.g., resting heart rate, resting blood pressure, body composition, grip strength, flexibility, weight, cardiovascular endurance) of approximately 100 clients. Once de-identified data compilation is complete by the end of March, data will be analyzed using SPSS with an alpha of .05 to examine the changes in each health index across semesters. The findings of the present study will help exercise physiologists to better their practice in prescribing exercise programs to future clients and to promote continued exercise programs to adults in the Chippewa Valley community.
Understanding the Impact of Chronic Intermittent Ethanol Exposure in Aged, Adult, and Adolescent
Meredith Watson, Kimberly James, Abigail Kastner
Faculty Mentor/Collaborator: Douglas Matthews

Populations in most countries are aging rapidly and potentially creating a public health concern. Approximately 25% of the United States population will be more than 65 years of age by 2030 and this will create new health concerns associated with increased lifespan. A large segment of older individuals consume alcohol at dangerous levels with up to 3% meeting the diagnostic criteria for an alcohol use disorder. Interestingly, 33% of the elderly with an alcohol use disorder did not begin risky drinking until later in life. These individuals have been termed Type 2 alcoholics. Little is known about the consequences of chronic alcohol use in later life due to few animal studies investigating alcohol use across the lifespan. The current set of studies investigates how chronic intermittent alcohol exposure impacts ataxia and learning in aged (~18 months), adult (90 days) and adolescent (30 days) male rats. All groups were injected, i.p., with one of two ethanol doses (1.5 g/kg or 2.5 g/kg) or saline every other day for 20 days. Aerial righting reflex and blood alcohol concentrations were measured 30 minutes following ethanol exposure on treatment days 1, 6 and 10. Seventeen days after ethanol exposure animals were trained in the spatial version of the Morris Water Maze. Aerial righting reflex was significantly impaired by alcohol administration in a dose dependent manner and this effect significantly interacted with the age of the subject (Two Way ANOVA, Age x Dose, F = 7.518, p < 0.001), with aged rats performing significantly worse (p < 0.05). Importantly, baseline aerial righting measures were not altered by CIE demonstrating the robustness of this task (p > 0.05). Hippocampal dependent spatial learning was impaired by prior CIE treatment, even though learning occurred 17 days following the last ethanol exposure (Two Way ANOVA, Dose x Day, F = 5.94, p < 0.01). Blood ethanol levels were dose dependent but did not differ between ages. These data suggest that alcohol produces impairments in both ataxia and learning and that these deficits may be significantly greater in aged animals.

Chemical and Earth Sciences

Menominee Room
Wednesday, May 3
3:00 – 3:50 pm

Computational Investigation of Li₂S Cathode and Organic Catholytes for Lithium-Sulfur Batteries
Zach Wawrzyniakowski
Faculty Mentor/Collaborator: Ying Ma

Lithium-Ion batteries have been the paradigm in rechargeable batteries since the 1990s, they are now used in everything from cell phones to electric vehicles. While their energy storage is sufficient to power small devices, their relatively low capacity hinders the advancement of long-range electric vehicles. Lithium-Sulfur (Li-S) batteries are a promising replacement for Lithium-ion batteries, with an energy storage four times greater than that of the Li-Ion battery. Lithium sulfide (Li₂S) has been identified as a promising cathode material for Li-S batteries, however the charging process presents a high activation barrier. To investigate this behavior, ab initio molecular dynamics was used to simulate the charging process by
removing lithium from the system. One way to get around the activation barrier is to introduce sulfur-containing catholytes into the system. In this catholyte, the sulfur-containing organic molecules are used as the cathode and mixed with the electrolyte. This overcomes the activation barrier presented by the pure Li$_2$S cathode, but presents some new challenges. Three molecules, DPTTs, DCF$_3$PtTs, and DCH$_3$OPtTs are investigated in Spartan, and the results are compared with the experimental data to determine the true behavior of these molecules.

**Ab Initio Study of the Structural Evolution of Sulfur Cathode in Lithium Sulfur Batteries**

Clare Arneson

Faculty Mentors/Collaborators: Ying Ma

Current rechargeable battery storage is limited by the capacity of Lithium-Ion technology. Lithium Sulfur (Li-S) batteries offer a safer and cheaper alternative while, most importantly, having a higher theoretical capacity for energy storage. Current Li-S battery technology, however, is limited by serious capacity fading. During battery discharge, octo-sulfur rings interact with lithium ions to from polysulfides. The formation of these soluble polysulfides causes the active material of the battery to dissolve in the electrolyte. As a result, the capacity of the battery is reduced significantly. In order to improve the capacity retention of current Li-S technology, it is important to understand the formation process of polysulfides. Using *ab initio* molecular dynamics simulations, we studied the structural evolution of Sulfur cathode and observed the dissolution of polysulfides. We also determined the equilibrium structure of various polysulfides such as Li$_2$S$_8$ and Li$_2$S$_6$. These studies will help to provide a better understanding of the formation of polysulfides during the battery charge/discharge cycle. With this knowledge, we will be able to investigate how to prevent sulfur dissolution and increase capacity retention.

**Spatial Variations in Sediment Transport Inferred from Downstream Fining Patterns of Bed Material, Lower Chippewa River, West-Central Wisconsin**

Allison Vincent, Kira Kuehl

Faculty Mentor/Collaborator: Douglas Faulkner

This study is a continuation of an investigation of the size characteristics of bedload material along the lower Chippewa River (LCR). The research objective is to identify possible spatial variations in sediment transport processes. Research conducted by others has shown that bed sediment of gravel-bed rivers tends to fine in the downstream direction over a range of spatial scales, likely due to complex sediment sorting processes. In this study, we examined downstream fining on armored bars at two different spatial scales: the reach and bar scale. We obtained grain-size data from 25 armored bars, with up to four sample sites on each, along a 60-km reach. We plotted grain-size statistics (D50 and D90) computed from field data against downstream distance to identify spatial trends. From these plots, we observed a general downstream fining trend with considerable scatter around the trendline. The scatter appears largely due to sorting that occurs at the bar scale. Additionally, the overall downstream trend indicates grain-size coarsening where the river’s planform changes from meandering to anabranching, first in the middle and then near the downstream end of the study area. Downstream from these reaches fining resumes, suggesting the anabranching reaches act as sources of bedload material.
Education and Pedagogy

Menominee Room
Thursday, May 4
9:30 – 10:45 am

**Development, Assessment, and Revision of Latin Rhythms Teaching Packets**

Brianna Hedeman, Samantha Taleff  
Faculty Mentor/Collaborator: Lee Anna Rasar

This project assessed what instruments, teaching structures, and songs worked best to teach residents Latin rhythm patterns at a regional juvenile detention center. The four Latin rhythm patterns were Bolero, Son Montuno, Tumbao, and Cha-Cha. Assessment included: visual presentation to represent each rhythm pattern and selection of options which are most successful; which instruments to use for each piece of the rhythm pattern and selection of options which are most successful; how to layer the rhythms and determine optimum number of layers for the rhythms in each pattern based on interplay between the rhythms and the method chosen as most successful; identification and creation of support system for adaptations needed to enable all students to follow cues from a leader to perform the rhythm patterns; selection of an accompaniment set for each rhythm based on ones which were most accessible to the residents when presented via audio or video files or live. The oral presentation will include demonstration of how to teach layers of rhythm patterns using words and visual cues and how to layer them in with music along with a summary of successful types of adaptations.

**Qualitative Research on Music Education Philosophy and Pedagogy in the Context of Juvenile Detention**

Amanda Halek  
Faculty Mentor/Collaborator: Lee Anna Rasar

Reflection on music education lesson planning, execution, and assessment post-execution will be evaluated using Gardner’s seven multiple intelligences to examine effectiveness and reception of those modes of presentation for residents at the Northwest Regional Juvenile Detention Center. The domains of visual/spatial, bodily-kinesthetic, linguistic, logical/mathematical, musical, interpersonal and intrapersonal intelligences will be assessed in relation to student success and motivation. Planned behavioristic techniques will also be evaluated based on how they impact lesson execution along with my responses to unplanned student stimuli during the lessons, paying attention to elements including: reactions to unexpected student feedback, how I intuitively distinguish when a student’s reactions are linked to other personal issues, and the effectiveness of my efforts to deescalate unproductive student behaviors. In developing and executing my own lessons, I’ve been able to assess the areas of uniqueness and pedagogical implications of teaching in a detention center setting. This is valuable to educators, especially music educators, because continued development of approaches for exceptional situations diversify the education community’s pedagogical toolbox. I’ve observed trends developing in my lessons that result in success using behaviorist classroom management techniques in combination with lesson plans that highlight multiple intelligences.
A Peer-Reviewed Database of Integrated Performance Assessments
Jessica Onsager, Jacinda Kinser
Faculty Mentors/Collaborators: Jessica Miller, Tomomi Kakegawa

This presentation summarizes research on proficiency-based instruction and discusses how Integrated Performance Assessments (IPA) connect instruction with evaluation tools. We present an idea for a free IPA database, and templates in various languages are shown. IPAs were developed by ACTFL (American Council on the Teaching of Foreign Languages) as standards-based, performance-based, developmental templates to assess learners’ proficiency with authentic cultural material and real-world situations. The IPA prototype includes three tasks aligned within a single theme, each designed to evaluate one of the three modes of communication: Interpretive, Interpersonal and Presentational. We researched best teaching practices in the proficiency-focused classroom and how IPAs are able to connect instruction with assessments. However, IPAs take much time and energy to design, thus limiting their implementation. This is why we also discussed the idea to create a free, peer-reviewed, user-friendly IPA database that would be made available for various languages and proficiency levels. We will be presenting feedback we received from language instructors. After having researched this summer, and with the help of our IPA database, we can describe the purpose and structure of Integrated Performance Assessments, apply the scenarios presented to our own classroom activities, and share our opinions of Integrated Performance Assessments.

Designing and Implementing a Successful Elementary School Vegetable Snack Program
Levi Soborowicz, Jared Fogarty
Faculty Mentor/Collaborator: Eric Jamelske

Poor nutrition among American children, including low fruit/vegetable intake have contributed to rising rates of childhood obesity persisting into adulthood. Thus, increasing children’s fruit/vegetable intake has become an important focus among practitioners, policymakers and researchers. Additionally, prior research indicates children eat more fruits than vegetables making increased vegetable consumption a priority. We partnered with one local elementary school to implement a vegetable snack program. This presentation outlines our motivation and describes the planning/study design and objectives/procedures for measurement/analysis. Study participants include students (N=218) and teachers (N=12) in grades K-3. Children were served grape tomatoes, baby carrots and green pepper strips eight times each over 24 days. Pre and post weights were recorded to calculate individual consumption for each child on each snack day. One classroom from each grade was assigned to a unique intervention condition (no encouragement, encouragement and encouragement plus) for the first six servings of each vegetable. All classrooms were assigned to the no encouragement condition for the final two servings of each vegetable. From past experiences we know that planning and setting up the design and outlining roles, duties and responsibilities of all participants is extremely important to generating meaningful data for analysis.
The current paper evaluates and synthesizes state statutes across the U.S. that apply to cyberbullying and sexting behaviors (directly or indirectly). In addition, pending or proposed legislation is documented to determine the direction states are headed with respect to dealing with these challenging problems. State laws were analyzed for updates of the summer of 2016. As states continue to struggle with how best to respond to these 21st century concerns, legislators will likely look to what other states have done in these areas.

Priming Prosocial Behavior in a Religious Setting
Victoria Beckmann, Graham Goodwiler
Faculty Mentor/Collaborator: Allen Keniston

Recent studies have demonstrated that activation, or priming, of religious ideas can influence people's prosocial behavior. This work is significant in that, surprisingly, few studies have tested causal hypotheses about the behavioral and psychological influence of religious belief. Researchers have done most of this work in controlled laboratory settings, raising the question of whether real world religious settings have the same effect. There are also questions about the strength of priming's influence and the specific quality of prosocial behavior that priming enhances, as well as whether the effect is primarily on self-report versus actual prosocial acts. Our study will address these questions by having participants respond to a survey of their "prosocial style," a measure of their religious beliefs, as well as volunteer to spread information about food resources to a local community in either a room in a church or a student study lounge. We expect religious respondents in a church setting to describe themselves as being more altruistically motivated to help other people and to volunteer to distribute more flyers about food resources than do those who are not religious or who complete the survey in a student study lounge.

A Content Analysis of Regional and International Coverage of Climate Talks: A Comparison between Agence France-Presse and Inter Press Service, 2013-2015
Austin Bower
Faculty Mentor/Collaborator: Won Jang

The idea that the international news agency news coverage has the potential to have a strong influence on the global community’s perceptions of the controversial issue is well established in popular framing discourse. We present an empirical content analysis that compares AFP (Agence France-Presse) and IPS (Inter Press Service) news agencies’ framing of the Climate Change issue from 2013 to 2015. We found that for consequences and current weather, two commonly used Climate Change frames, each agency framed the issue differently from one another. It also found that both agencies published differing
amounts of news coverage and relied on different sources. We attribute those differences to the influence of the two government’s propaganda efforts on the news agencies’ reporting.

**The NorthMet Sulfide Mining Project**

**Jared Berg**

Faculty Mentor/Collaborator: *Tarique Niazi*

For hundreds of years, mining has been a dominant source of economic well-being for residents in Midwestern United States. Historically, economic rationality alone would factor into authorities’ decisions to greenlight a mining operation. However, the accumulated environmental impact of such projects has communities and governments (city, state and national) evaluating mining operations on additional criteria of environmental and social impact. As a result, economic rationality of a given project now competes with its environmental and social rationalities, which produce a number of actors voicing their agendas – developers, miners, mining companies, government leaders, community activists and environmental groups. The NorthMet Sulfide Mining Project in northern Minnesota, which will mine copper, nickel, cobalt and gold from sulfide ore, is reflective of these competing rationalities. The project’s supporters stress economic rationality, while community and environmental activists articulate its environmental and social impact, especially for cities of its location – Hoyt Lakes and Babbit. I have identified a number of actors involved in the project: PolyMet (the project operator), U.S. Wildlife Service, U.S. Forest Service, Minnesota Department of Natural Resources, Minnesota Pollution Control Agency, and Center for Biological Diversity and Earthworks. While developers, the mining company and government leaders emphasize economic benefits in job creation, community activists and environmental groups balance those benefits with the projects’ impact on the land around the project site and the water systems, including the St. Louis watershed that flows into Lake Superior. My findings will illuminate the project approval process, and help understand the context-dependent analysis of environmental and social impacts.

**Language, Communication, and Texts**

**Menominee Room**

**Thursday, May 4**

12:30 – 1:45 pm

**Homophone Use and Perception**

**Wyatt Biegel**

Faculty Mentor/Collaborator: *Blaine Peden*

Can people living in a technological world still correctly perceive and use homophones? The goal of this project is to determine if the constant use of technology has some influence on the writing capabilities of people. For example, students use technology extensively. In addition, more and more student papers have errors that are not identified by spell check because the spelling is correct, and the reading of the paper aloud suggests no errors because everything will be pronounced correctly. However, if another person reads the paper they find errors with many homophones. The experiment conducted via Qualtrics presented 30 sentences with both dominate, or common homophones, and subordinate, or less common homophones. Prior research indicates that subordinate homophones tend to be more difficult to identify.
and use; however, this study showed that dominate, or common, homophones caused more issues for people. These results suggest that technology hinders our abilities to perceive and correctly use homophones.

**Boosting Collaboration between McIntyre Library’s Research Center and the Center for Writing Excellence**

**Danielle Rockwell, David Kocik**

Faculty Mentors/Collaborators: Katherine Hinnant, Jill Markgraf

McIntyre Library’s Research Center and the Center for Writing Excellence (CWE) offer complementary services to students across the disciplines, but collaboration between the two units could be strengthened. We ran two consecutive investigations. First, we assessed CWE Writing Assistants’ perceptions of what services the Research Center offered. After a training intervention, we retested these perceptions using a survey with the same inventory of questions. Second, we deployed a referral tracking system and trained both CWE Writing Assistants and Research Center staff on when to refer a student to the other unit. We will be counting both how many referrals were made and how many students followed through by going to the other center. While there is much literature on library/writing center collaboration, much of it focuses on colocitation. Our study focuses on programmatic shifts that can be used in any library/writing center arrangement. Our first investigation revealed that Writing Assistants had minimal knowledge about the Research Center and that training increased CWE Writing Assistants’ understanding about what kind of help students would find there. The results of our second investigation are still pending, but we expect individuals at each location will be more intentional about making referrals.

**Shipwrecked! An Entertainment in Puppetry**

**Allison Litke**

Faculty Mentor/Collaborator: Amanda Profaizer

During the semester of Fall 2016, I had the pleasure to be on the design team for Shipwrecked! An Entertainment: The Amazing Adventures of Louis de Rougemont (As Told by Himself). My main roles during this process was to design and create all the puppets for the show, as well as find and build all the stage properties. The goal was to design the puppets by thinking spatially on how the creatures would move, and to support the magical narration of the show. My design intention was to tell the story through shadow puppetry, as well as the utilization of “found objects” to make the puppets that would be on stage controlled by the actors. After extensive research on puppetry, these goals were achieved by building and utilizing multiple puppets who represented sea creatures during a spectacular underwater scene, and the use of shadow puppetry to be a visual representation of what was being narrated on stage through of Louis de Rougemont’s point of view.

**Art [AND] Empowerment: Poetry of the Grey Area**

**Alexander Zitzner**

Faculty Mentor/Collaborator: Patti See

Binary thinking plagues our understanding of convention. Gender, politics, religion, amongst other areas of thought, are often contextualized through two (sometimes more), viewpoints. However, these viewpoints, as I have explored through my poetry, open a territory beyond the “black and white” to the “grey areas.” From there, we can originate ideas to show that systems cannot be “cut and dried” or understood solely through simply two parts. Building from the idea that art inspires more art, with the poems that make up this project, I show the power that poetry has when feeling marginalized or voiceless in a culture that largely consists of ‘normalized’ rhetoric.
Immersion Experience Presentations

Centennial Room
Wednesday, May 3
9:00-9:50 am

Guatemala: Social and Environmental Justice
Jessa Kristjanson
Faculty Mentors/Collaborators: Maria Carvalho, Kaishan Kong, Fabiola Varela-Garcia

13 UWEC students and 3 faculty/staff traveled to Guatemala for two weeks during Winterim 2017 for an immersion program that explored social and environmental justice issues through hands-on engagement and interactions with Guatemalan community members. Students participated in community-based projects to investigate equity and sustainability related to the distribution and use of natural resources in several unique cultural settings, and met local leaders who are working to improve the natural environment and the lives of Guatemalans. They completed service learning projects, stayed with host families, and learned about fair trade coffee from local farmers. This presentation is about the program and what students learned.

Chinese Language and Cultural Learning through Community Service
Katherine Kocen
Faculty Mentor/Collaborator: Kaishan Kong

During the International Fellows Program to China in the summer of 2015, three UW-Eau Claire undergraduate students taught English to 23 underserved children in a summer camp. They conducted a qualitative exploratory study on Chinese rural students’ perceptions of having English native speakers as English teachers, and how that learning experience fostered their understanding of American culture. Three student researchers collected data through interviewing and identified several themes for discussion, and will be presenting on their outcomes.

Centennial Room
Wednesday, May 3
10:00-10:50 am

Argentina: Culture, Society, and Economics
Lydia Boerboom, Abigail Johnson
Faculty Mentors/Collaborators: Rose-Marie Avin, Jeff DeGrave

12 UWEC students and 2 faculty traveled to Mendoza, Argentina for three weeks during summer 2016 on the first iteration of this new immersion program. The program focused on various social, political, and economic issues facing Argentina today, as well as the role that Argentina and the Mendoza region play in Latin America and the world economy. Students lived with host families, attended lectures at the
Universidad de Congreso, and took a tour of the Andes Mountains. They will be presenting on what they learned during this international immersion.

**Czech Republic: Early Childhood in Prague**

**Stephanie Larson, Megan Ponty, Abby Williamson**

Faculty Mentors/Collaborators: *Kirstin Rossi, Cathy Thorsen*

This presentation is by 3 students on the international immersion to Prague over summer 2016. The program provided students with a broader prospective of the early childhood profession through critically analyzing and reflecting on one's behaviors and attitudes related to teaching children from diverse linguistic, ability, socioeconomic, and cultural backgrounds. The program was based in Prague where students stayed with host families and volunteered at an English Immersion primary school, but also included travel to historical and cultural sites in Germany, Austria and Poland.

**Reflections on the Hmong in Thailand**

**Dua Ci Khang, Pachia Xiong, Gemeng Vang**

Faculty Mentors/Collaborators: *Joseph Orser, Ka Vang, Crystal Vang*

During Winterim 2017, 19 students and 3 faculty traveled to northern Thailand on a faculty-led immersion program designed to connect the experiences of Hmong people in Thailand with those of the Hmong in America. The group explored everyday life during home stays in Hmong villages, visited the villages of other highland ethnic groups, and rubbed shoulders with leading scholars at an International Hmong Studies Conference at Chiang Mai University. Three students will present on the new perspectives they gained as a result of their immersion experience.

**Centennial Room**

**Wednesday, May 3**

**11:00-11:50 am**

**Ecuador: Culture and Geography**

**Kayla Coonen, Morgan Freeburg, Taylor Tremain**

Faculty Mentors/Collaborators: *Jeff DeGrave, Shanti Freitas*

This presentation is by 3 of the 16 students who participated in a new international immersion to Ecuador for three weeks over Winterim 2017. The program focused on exploring two geographical landscapes (Andes Mountains and Amazon Jungle Basin) in connection with how global forces are impacting the local environment, learn about the cultural diversity while recognizing a history of inequality and marginalization of certain ethnic groups, and understanding the inseparable interrelationship between those geographies and cultures. The program included a service learning project, a 4-day homestay with rural indigenous Kichwa families, and a visit to largest indigenous market in South America. Students will be presenting on what they learned and how they were impacted.
India: Global Feminisms
Allison Schneider, Nicole Sornson
Faculty Mentors/Collaborators: Ari Anand, Cathy Rex

2 UWEC students from the international immersion to India for three weeks during Winterim 2017 will be presenting on their experiences. The program focused on gender issues facing women in both rural and urban India, gender in relation to Indian law and public policy, and the rich history and culture of the Delhi metro area and in Agra and Jaipur. UWEC students studied alongside Indian students at the Women’s Studies Development Center (University of Delhi), and participated in field work together with local NGOs on projects in nearby communities.

India: Globalization
Kelsi Kruchten, Zach Young
Faculty Mentors/Collaborators: Brenda Thalacker, Ganga Vadhavkar

During Winterim 2017, 13 students and 2 faculty traveled to India on a faculty-led immersion program that related to the business, economy, politics, society, religion, history and culture in India. Students attended classes at the Shri Ram College of Commerce in Delhi, completed group projects alongside Indian business students, and visited businesses around Delhi. The program also included a weekend excursion to the Taj Mahal, Agra and Jaipur, as well as 4 days in Mumbai for cultural and business visits. In this presentation, two students will be discussing their experience.

Centennial Room
Thursday, May 4
9:00-9:50 am

Embracing the Somali Immigrant Experience in Midwestern Public Schools
Maria Delgado Gomez, Delaney Nelson
Faculty Mentors/Collaborators: Stephen Hill, Dandrielle Lewis

The domestic immersion to Minneapolis/St. Paul over Winterim 2017 provided students with opportunities to expand their cultural competencies, pedagogical practices, and depth of personal interaction surrounding topics related to Somali experiences and to social justice issues in general. The experience included more than 24 hours of classroom-based instructions, a week-long, full-day, field placement in specially selected schools that serve primarily Somali youth, and daily excursions in and around the Somali community. Students will be presenting on their experiences and what they learned.

New York City Aspiring Artists
Kathryn Beu, Yi Hsien (James) Li, Leah Pickhardt, Autumn Schacherl
Faculty Mentors/Collaborators: Arthur Grothe, Kenneth Pereira, Amanda Profaizer

12 UWEC music and theatre students and 3 faculty traveled over Spring Break 2017 to New York City to be engaged in the study of instrumental and vocal performance, music education, and theatre. Students performed, studied, attended performances, conducted interviews, and interacted daily with artists and people from a wide variety of backgrounds and perspectives. Students also collaborated, interacted, and
shared music with students from the Brooklyn High School for the Arts. They will be presenting on what they learned from this one-week high-impact practice.

**UWEC [AND] the Something New Domestic Intercultural Immersion ASB: An Exploration of the Impact of High-Impact Practices on Blugold Attitudes Surrounding EDI Initiatives 2.0**

Jenna Jandt, See Khang, Raychel Menne
Faculty Mentors/Collaborators: Nicole Schultz, Deb Pattee, Joshua Nesja

Over Spring Break 2017, 40 students and faculty/staff leaders traveled to Clarkston, Georgia to explore the issues of immigration and the effects of discourse involving refugees. Participants completed an 8-hour King Nonviolence Training Seminar, worked with youth who recently immigrated from all across the world, engaged in a variety of service learning projects, and spent a day in historic Selma, Alabama where they participated in an interactive slavery re-enactment, learned the rich history of the town, and marched the Edmund Pettus Bridge that Dr. King marched in 1965. This research explores student experiences on the Something New Alternative Spring Break trip, a university-supported Domestic Intercultural Immersion (DII) high-impact practice. The primary purpose of the current research is to expose Blugolds to the reality of the refugee under the current political climate, activism, and community partnerships. Conclusions and implications exemplify the significance of DII trips in supporting the development and implementation of Equity, Diversity, and Inclusivity (EDI) initiatives on campus, assessed and contextualized utilizing tenets of Social Judgment Theory (Griffin, 2006).

**Centennial Room**

Thursday, May 4
10:00-10:50 am

**Companeros en Salud y Seguridad/Partners in Health and Safety**

Lauren Fleming, Jamie Hoelter, Roxanne Holt, Ann Keller, Josafine Knauber, Halie Milas, Erica Murray
Faculty Mentor/Collaborator: Lisa Schiller

For 7 days during the fall and spring semester, UWEC Nursing students travel to large dairy farms in Western Wisconsin to provide screenings, immunizations, and education to mostly Latino farm workers. Students integrate knowledge of agricultural health and safety, and an understanding of rural and Latino culture into their nursing practice, by providing on-site education and basic health screenings. The program includes preparation in collaboration with partners, culturally sensitive services to farm workers, and debriefing sessions upon completion of the experience.

**Yosemite: Land, Art, and Literature**

Elizabeth Fedewa, Derek Lindquist, Jared Stone
Faculty Mentors/Collaborators: Harry Jol, Stephanie Turner

Dr. Harry Jol (Geography) and Dr. Stephanie Turner (English) led 14 students from geography, geology, English, art and design, and communication and journalism through a trip to Yosemite National Park. Highlights of the trip included three park ranger talks, day-long hikes through sections of Yosemite (the Hetch Hetchy reservoir, Angel Falls, the Mist Trail, a sequoia grove), with side trips to Mono Lake (an
inland salt lake just east of Yosemite), Rosie the Riveter Park/WWII Home Front National Park in Richmond, California, the La Brea Tar Pits and two beaches in Los Angeles, the San Francisco Museum of Modern Art, and Chinatown. Topics covered included wildlife identification, geological formation, park safety, writers and artists of Yosemite, and California’s cultural and labor history.

Public History Presentations

Ho-Chunk Room
Wednesday, May 3
11:00-11:50 pm

*Historic Rails and Trails: Preserving and Interpreting Historic Transportation Routes*

Faculty Mentor/Collaborator: John Mann

*The Yellowstone Trail*
John Mann

*Northwestern Railroad Bridge (“High Bridge”)*
Kiersten Bauer, Benjamin Johnson, Andrew Kellerman, Kendra Polizin

*Soo Line Railroad Bridge (“S Bridge”)*
Maxx Handel, Rachel Lange, Rachel Lavender, Kendall O’Neal

*Chicago and Northwestern Railroad Interlocking Tower (“Switching Tower”)*
Erica Shrader, Tyler Shustarich, Samantha Teske, Nathan Why

Students enrolled in History 486/686: Seminar in Public History have conducted research on the history of transportation for several community partners. Professor Mann will discuss student research on sites along the Yellowstone Trail, a transcontinental automobile route used in the early twentieth century, completed for the Yellowstone Trail Association. Students also worked in groups to complete National Register of Historic Places nominations in partnership with the City of Eau Claire, the Chippewa Valley Railroad, and the Wisconsin Historical Society for three Local Landmarks: The High Bridge, the S Bridge, and the Switching Tower in Carson Park. The students will make presentations on the significance of these railroad-related structures.
CERCA Performances and Films

Alumni Room
Wednesday, May 3
11:30 – 12:20 pm

Piano Transcriptions of Popular Rock Songs by Bon Iver, David Bowie, Passenger, and The Police
Paul Nuyda, Austin Caldie, Nathan Cicero
Faculty Mentor/Collaborator: Nicholas Phillips

The goal of our project was to create a concert version transcription of a popular rock song for solo piano. We began by studying general transcriptions from composers of the past such as Liszt and Busoni (who transcribed classical music) to present day artists such as Cristopher O’Riley (who transcribes popular music). Then, we each selected a song from artists including David Bowie, Bon Iver, Passenger, and The Police, and transcribed it for solo piano. We studied a variety of piano transcriptions from the past of musical genres like songs, symphonic, operatic, and popular tunes from the 21st century and looked at specific techniques and musical ideas that the other composers have used to transcribe a piece for piano. We asked ourselves key questions like: Is the transcription literal? How is text accommodated, if at all? Does the transcription have limits, compared to the original? Does the transcription enhance anything, compared to the original? We used these techniques and questions to give each of these songs our own creative spin. The process involved much trial and error to create something satisfying that represented the original song. Each experience and transcription will be presented by live performance.

Woodland Theater
Wednesday, May 3
12:30 – 12:55 pm

Fusion of South African Music: Compositions based on the Fieldwork in South Africa
Austin Williams
Faculty Mentor/Collaborator: Chia-Yu Hsu

The goal of the project is to collect first-hand information of traditional and current music in South Africa and use the research to help students learn to compose fusion and to developing methods of fusion. The project was proposed and supervised by Dr. Chia-Yu Hsu. Through interviews and experiences we were able to conclude elements of traditional South African music in art music that was composed by South African composers. There were varying interpretations as to what is appropriate to use for material and different ways to incorporate traditional music into their own cannon. The political climate in South Africa is incredibly complex thus making these issues that much more prevalent and harder to cope with. We interviewed 5 composers: Peter Klatzow, Neo Muyanga, freelance composers in Cape Town and Roosenschoon and Arthur Feder professors Stellenbosch University and Hans Huysen of Stellenbosch.
Through these interviews we can get an idea of different ways to incorporate our own folk music into our own compositions. The results of this project yielded a program of works for solo and chamber ensemble which will be premiered in St. Paul. Students were able to complete a professional composition, gaining valuable experience and advice that will carry with them into their future professional lives.

Woodland Theater
Wednesday, May 3
1:00 – 1:25 pm

_Fear, Money, and Racism in the 1920s: A Recipe for Disaster_
 Mitchel Orlovsky
Faculty Mentor/Collaborator: Selika Ducksworth-Lawton

In 1915, the Ku Klux Klan reemerged and firmly established itself in the South of the United States. The 1920s Klan is regarded by historians as the most influential in terms of the amount of people it was able to garner support from, the foundation it laid in politics at all levels of government and the vast distance through which it spread throughout the United States. How much influence did the Ku Klux Klan have in the Eau Claire, Chippewa, Clark, and Dunn counties of Wisconsin? What were the Klan’s strategies and tactics and how did this motivate people of both sexes to join? The Peter Minwegen Papers (a Catholic Priest’s memoirs) and other primary sources that originated in and surrounding Eau Claire County were examined and analyzed in historical context. Historical analysis of secondary sources was also done. The results show that due to a massive Protestant population the 1920s Klan was able to have a strong influence in the western region of Wisconsin. Not only this, but both fear and excess of wealth were driving factors that led both men and women of White, Anglo-Saxon, and Protestant descent into the Klan.

Woodland Theater
Wednesday, May 3
2:00 – 2:25 pm

_Shostakovich’s Life and Compositional Practice through The String Quartets_
 Erin Thom, William Callaway, Jaryn Danz, Bryce Sanville
Faculty Mentor/Collaborator: Tulio Rondon

This past summer in Italy we set out to research the life and string quartets of the 20th century Russian composer, Dmitri Shostakovich. He composed during Stalin’s reign and his works are often described as autobiographical, or relating to his life at the time of their composition. Our research set out to confirm this thesis by studying his First, Eighth and Eleventh String Quartets. A secondary goal was to use the research to inform our performances of the quartets at a lecture recital. We examined three of Shostakovich’s fifteen string quartets and the corresponding events in his life. Then, we investigated how these events were represented in the scores of his works. We found that there is a direct link between his life events and the character of his string quartets. Each quartet studied signifies pivotal moments in his life and by extension three distinct compositional periods. This research gives insight into the life and compositions of one of the greatest composers of the 20th century, Dmitri Shostakovich.
Woodland Theater
Wednesday, May 3
2:30 – 2:55 pm

*Listening to Literature; The Poetry of Franz Schubert’s Winterreise*

**Zach Klein**
Faculty Mentor/Collaborator: *José Alvergue*

Winterreise, composed by Franz Schubert, is one of the most renowned cycles of lieder in German vocal repertoire. My research concerns the cycle of poetry, written by Wilhelm Muller, and the discrepancies between the poetic cycle and the musical cycle, as the poems were published in a different order than the songs. The significance of poetry in classical vocal music is usually overlooked for the sake of the music itself, or for the fact that the vocal technique covers up the dictation of the words. However, the power of the poetry can transcend the normal performance and add to a more communicable and emphatic performance. My methods involve both poetic and musical analysis (harmonic, motivic, formal) of the poems in the order in which they were published as poetry. My findings between the two iterations of the story include temporal contrasts, external vs. internal interactions, and conclusions on the psychic identity of the narrator of the cycle. These conclusions are drawn through the lenses of Romantic literature, Lacanian psychoanalysis, and the interpretations of Schubert himself, towards the utilization of music to create a more emotionally compelling performance.

Dakota Ballroom
Wednesday, May 3
3:30 – 3:55 pm

*Intersections of Vulnerability: Invisible Truth Performance*

**Courtney Grieser, Lillian Strehlow, Emily Elliot**
Faculty Mentor/Collaborator: *Arthur Grothe, Nicole Schultz*

The significance of this devised theater production was to generate individual and social responsibility to effect change that promotes social justice. We wanted to investigate the intersections of disproportionately vulnerable populations in such a way that breaks down stereotypes and raises awareness for local not-for-profit organizations (i.e., Positive Avenues, LSS and Fierce Freedom) in the Chippewa Valley. As privileged people, it is important for us to realize our positions of power and seek out ways to use our cultural, social, legal, and ethical contexts to fight for awareness, change and equality for the less fortunate community that we all too often turn a blind eye to. Using a combination of theatre, communication, women’s studies, and music, an interactive devised theater program (similar to that of UWEC’s Tunnel of Oppression) was created to display artifacts collected by students from voices of members of Eau Claire’s lower socioeconomic and homeless population. Participants walked through two different staged rooms designed to highlight oppressions of marginalized groups, emphasizing social, economic, and political inequalities that are perpetuated by human interaction.
Women’s Studies Capstone Presentations

Ho-Chunk Room
Thursday, May 4
12:30 – 2:30 pm

Faculty Mentor/Collaborator: Rose-Marie Avin

AIDS Resource Center of Wisconsin Externship (ARCW)
Laura Jones Holm, Emily Monka, Erica Spitzer

For our capstone project with the AIDS Resource Center of Wisconsin (ARCW), we will be working closely with the Lifepoint Needle Exchange Program and Q2, the LGBTQ+ Youth Group for the Chippewa Valley. We will be trained on how to run the needle exchange, restock supplies, and provide information about ARCW's services to those utilizing the needle exchange to prevent the contraction and spread of blood-borne illnesses such as HIV and Hepatitis-C. With Q2, we will be helping organize their annual Queer Prom by delegating and completing necessary tasks such as: selecting a theme, contacting community partners, getting together performers and chaperones, and going to local high school GSAs (Gay, Straight Alliance) to promote the April 28th event. On St. Patrick's Day, we will also be doing a 'Condom Crawl' which consists of handing out condoms to patrons of local bars and having open discussions about safe sex practices.

EX-Prisoners Organizing (EXPO)
Katelyn Haupt

EX-Prisoners Organizing is a statewide organization made up of members who have been directly affected by the criminal justice system. These members and their families are fighting to end mass incarceration, reform the unjust penal system, and provide support to each other. I have worked with EXPO to kick-start a women's campaign; this included conducting research on currently and previously incarcerated women’s experiences through academic articles on general statistics as well as through surveys completed by women in Eau Claire. The data collected will be used to illuminate the experiences specific to female-identifying prisoners and ex-prisoners in local Eau Claire, and identify the support they need. Moving forward, this will allow EXPO to formulate projects that will most benefit currently and previously incarcerated women in Eau Claire.

Family Support Center
Kezia Jenkins, Danielle Koenig

The mission of the Family Support Center (FSC) is to empower all individuals, families, and communities to live free from domestic violence, sexual assault, child abuse and interpersonal violence through education, prevention and intervention. Our main work with Family Support Center is helping organize and implement their "Know More" event which will take place on April 25th. The "Know More" event focuses on Sexual Assault Awareness Month and will include resources, door prizes, and community contact. Kezia and I are in charge of talking to individuals for donations, organizing a march at a park for this event, creating posters/flyers, finding speakers/performers and just helping in any way possible. We
also have been going to FSC and learning more about the organization and figuring out ways to help in any way they see fit.

**Hmong Mutual Assistance Association (HMAA)**  
*Gaochi Vang, Koeai Xiong*

Our project is focused on raising awareness and reaching out to victims of sexual assault and domestic violence, specifically in the Hmong community. We will be working alongside Haopay Lee – a Ntuj Tshiab and sexual assault advocate from the Hmong Mutual Assistance Association – with her “Be the Light” Campaign. For the “Be the Light” campaign, we will be organizing and implementing a luncheon where we take part in open discussions on rape culture and abusive international marriages (AIM). We also discuss and confront issues risen between cultural differences; specifically, between the Hmong and American culture. Through our work with HMAA, we hope to continue to follow their mission of empowering people, advancing culture, and enhancing the quality of life.

**Planned Parenthood**  
*Janel Balsavich, Logan Frodl, Tia Krueger, Ashlea Orth, Autumn Stargardt*

We will work as community organizers to find out what issues people face in the Eau Claire Community. More specifically, we will be doing some “feminism on tap” events, we will be getting involved in doing a condom crawl in reference to the Get Yourself Tested (GYT) Month (in April), and we will be doing a social media segment involving the sharing of stories along with influential photos.

**Western Dairyland**  
*Jackie Hagenbuchar*

My externship is with Western Dairyland’s Women’s Business Center. The Women’s Business Center is a non-profit organization serving Western Wisconsin. They work with start-ups and existing businesses to offer assistance and training in all aspects of business, including business plan development, marketing, management, and finance options. Special efforts are made to assist economically and socially disadvantaged women through low or no-cost classes, events and business counseling. The major event for the Business Center is the annual Women’s Business Conference which is what I’ll be helping with during my externship. I will help organize networking opportunities with educational sessions, roundtable discussions, an exhibitor hall full of business resources and a networking lunch.
Undergraduate Poster Presentations

Education and Scholarship of Teaching and Learning

Biology

Course Development with an Undergraduate Lens: Building a Cellular/Molecular Lab Class

Hannah Anderson, Katelin Viesselmann
Faculty Mentor/Collaborator: Jamie Lyman Gingerich

The need to revise and adapt an advanced cellular/molecular biology laboratory course provided an opportunity to pilot a different approach to course development. One unique aspect of this method was the involvement in both experimental protocol testing and assessment tool development of two undergraduate biology students with varying educational and skill levels. The eight-week project involved two sections in which pre-existing lab protocols were revised and altered to fit the needs of the University of Wisconsin- Eau Claire Biology department. Undergraduate approachability and scaling were kept in mind to ensure an optimal transition from the research lab to the teaching lab. This backward design approach aimed to create a new model that is transferrable to other courses and departments. To measure the effectiveness of the modules as learning tools, pre- and post- surveys have been administered to the students taking the course. Analysis of these assessments is ongoing. This approach to course development proved successful both in preparing a robust learner-focused course while developing the skills of the undergraduate researchers involved.

Chemistry

Flipping the General Chemistry Laboratory: Increasing Student Engagement by Enhancing Self-Directed Learning

Gabrielle White
Faculty Mentor/Collaborator: Roslyn Theisen

Strengthening instruction in STEM fields can benefit student learning as well as foster positive attitudes towards the sciences. This project tries to answer the question whether there is a measurable difference in understanding of and attitudes towards chemistry of two groups: students who complete a General Chemistry course where there the laboratory lecture is in a flipped format and students who complete a General Chemistry course where the laboratory lecture is in a traditional lecture format. The goal of this study is two-fold: to gather information about the impact of flipped and traditional teaching modes on student understanding of course material as well as measure the students attitudes towards the subject of chemistry. Our hypothesis is that students who are enrolled in the flipped curriculum course will have a higher measurable outcome of understanding of and attitudes towards chemistry.
Flipping the General Chemistry Laboratory Lecture: Increasing Student Engagement by Enhancing Self-Directed Learning

Hannah Nennig
Faculty Mentors/Collaborators: Roslyn Theisen, Jason Halfen

This project tries to answer the question whether there is a measurable difference in understanding of and attitudes towards chemistry of students who complete a General Chemistry course where the laboratory lecture is in a flipped format versus in a traditional format. The goal of this study is to gather information about the impact of flipped and traditional teaching modes on student understanding of course material along with measuring the students' attitudes towards the subject of chemistry. In this study, flipped and traditional student attitudes and understanding will be assessed by several quantitative and qualitative measures. A published, validated and reliable attitude survey on the subject of chemistry will be given to student participants (the ACSI v2) at the beginning and at the end of the course. To quantitatively assess student understanding of general chemistry for both groups, several measures will be examined and statistically analyzed, such as midterm and cumulative final exam scores. Qualitative feedback will also be collected and discussed. Our hypothesis is that students who are enrolled in the flipped curriculum course will have a higher measurable outcome of understanding chemistry and attitude towards chemistry.

Communication and Journalism


Jenna Jandrt
Faculty Mentors/Collaborators: Nicole Schultz, Joshua Nesja

Over Spring Break 2017, 40 students and faculty/staff leaders traveled to Clarkston, Georgia to explore the issues of immigration and the effects of discourse involving refugees. Participants completed an 8-hour King Nonviolence Training Seminar, worked with youth who recently immigrated from all across the world, engaged in a variety of service learning projects, and spent a day in historic Selma, Alabama where they participated in an interactive slavery re-enactment, learned the rich history of the town, and marched the Edmund Pettus Bridge that Dr. King marched in 1965. This research explores student experiences on the Something New Alternative Spring Break trip, a university-supported Domestic Intercultural Immersion (DII) high-impact practice. The primary purpose of the current research is to expose Blugolds to the reality of the refugee under the current political climate, activism, and community partnerships. Conclusions and implications exemplify the significance of DII trips in supporting the development and implementation of Equity, Diversity, and Inclusivity (EDI) initiatives on campus, assessed and contextualized utilizing tenets of Social Judgment Theory (Griffin, 2006).
Communication and Journalism and Music and Theatre Arts

**Intersections of Vulnerability: Theatre & Social Change**  
Courtney Grieser, Lillian Strehlow, Emily Elliott  
Faculty Mentors/Collaborators: Nicole Schultz, Arthur Grothe  
Poster #: 56

The significance of this devised theater production was to generate individual and social responsibility to effect change that promotes social justice. We wanted to investigate the intersections of disproportionately vulnerable populations in such a way that breaks down stereotypes and raises awareness for local not-for-profit organizations (i.e., Positive Avenues, LSS and Fierce Freedom) in the Chippewa Valley. As privileged people, it is important for us to realize our positions of power and seek out ways to use our cultural, social, legal, and ethical contexts to fight for awareness, change and equality for the less fortunate community that we all too often turn a blind eye to. Using a combination of theatre, communication, women’s studies, and music, an interactive devised theater program (similar to that of UWEC’s Tunnel of Oppression) was created to display artifacts collected by students from voices of members of Eau Claire’s lower socioeconomic and homeless population. Participants walked through different staged rooms designed to highlight oppressions of marginalized groups, emphasizing social, economic, and political inequalities that are perpetuated by human interaction.

Communication Sciences and Disorders

**@educators: The Functionality of Twitter in an Online Graduate Course**  
Lian Arzbecker, Torri Pulley  
Faculty Mentor/Collaborator: Thomas Sather  
Poster #: 198

The purpose of this project is to examine the pedagogical and professional network building effects of Twitter integration into a graduate-level, communications sciences and disorders (CSD), online course. There are multiple professionals in CSD and healthcare-related fields who utilize Twitter to disseminate relevant clinical and academic content. Thus we hypothesize that students' learning experience will be enhanced by using Twitter as an academic learning tool. Additionally, Twitter may serve as an effective medium for students to network with academic and clinical professionals. In this study, 26 online CSD graduate students were surveyed using a pre-developed survey regarding Twitter attitudes and behaviors. Additionally, a freeware Twitter analytics program (Tweetchup) and an anonymous open-ended questionnaire were used for measuring Twitter activity and behavior. Multiple Twitter behaviors were analyzed including number of tweets, types of content followed, and embedded use within course assignments. Results indicate a wide range of Twitter use and perceptions among participants. Results will be discussed related to the advantages and disadvantages of Twitter use in an online course, student perceptions of Twitter use, and application of Twitter to support content learning as well as professional networking.

**Comparing Online vs. Face-to-Face Graduate Outcomes and Performance in CSD: A Retrospective Review**  
Emily Symons, Emma Steines  
Faculty Mentor/Collaborator: Abby Hemmerich  
Poster #: 229

With the rise in technology advancements in the past decade, educational coursework has expanded into modalities beyond the traditional face-to-face classroom. Undergraduate and graduate students can now
be connected to universities remotely via distance education and/or online instruction, allowing programs to reach students across the country. At the University of Wisconsin-Eau Claire, the Graduate Program in Communication Sciences and Disorders (CSD) has expanded to include both a residential and online program for students. In this retrospective review, CSD graduate student performance in the online and face-to-face programs were compared to determine equivalency between the programs. Quantitative data analysis of final papers, exams, and grades was completed to compare student performance across the two programs. Similarities and discrepancies between the graduate student performance in all courses (online and face-to-face) will be provided. Student attitudes and perspectives toward online coursework will also be discussed.

The Effects of Cultural Knowledge and Exposure on Speech and Language Assessments
Yer Lor
Faculty Mentor/Collaborator: Abby Hemmerich

Cultural competence is necessary to provide appropriate speech/language services for children of diverse cultural and linguistic backgrounds. The purpose of this study was to examine the influence of culture on play-based interactions between a child and clinician. We hypothesize that a “cultural match” of a child and clinician will result in more robust performance on speech and language assessment measures than situations of a “cultural mismatch”. We will analyze the interaction and language of female Hmong children and female white children during a play-based session with a female Hmong clinician and a female White clinician. The play-based sessions were comprised of three activities involving conversation, reading wordless picture books, and playing with toys. Videos from these sessions will be transcribed and analyzed for language quantity and complexity, use of non-verbals (such as gestures and facial expressions), and other behaviors. Quantitative and qualitative comparisons of language, non-verbal communication, and overall interaction for both the children and the clinicians will be made between the cultural match and cultural mismatch conditions.

Effects of Focused Writing on Student Learning in a Foundational Communication Sciences and Disorders Course
Ellen Blacklock, Nicole Nolte Rierdon
Faculty Mentor/Collaborator: Abby Hemmerich

The use of informal writing assignments has been shown to improve understanding, recall, complex thinking, metacognitive skills, and class attendance. The purpose of this study was to examine the relationship between writing on different types of topics and student comprehension in a foundational Communication Sciences and Disorders (CSD) course. Participants were undergraduate students in a CSD course who were randomly assigned to one of three groups. In this multiple baseline design, each group was required to respond to writing prompts following a brief review on content by the instructor. Following the writing, participants completed a 5-question quiz. All groups began the study writing on broad, reflective topics (baseline phase). During the second unit, one group began writing on very specific content prompts (treatment phase). In the third unit, an additional group was added to the specific content prompt writing, while the third group did not begin this condition until the final unit of the course. Scores from the quizzes, as well as exam performance, will be compared across groups. Qualitative analysis of the writing samples will also be discussed.
Evaluating the Effects of Mandatory and Non-Mandatory Discussion Posts on Student Learning and Engagement in an Online Course
Alyse Korpela, Marianna Esveld
Faculty Mentor/Collaborator: Abby Hemmerich, Tom Sather

Although online learning is becoming more accessible and acceptable, there is still much to learn about effective pedagogy in this environment. The purpose of this study was to explore the effect of discussion board grading on student learning and student engagement in online discussions. The professors of a one-semester online undergraduate course in Communication Sciences & Disorders built an online discussion board into the requirements for the course. The students were randomly divided into two groups. Group A was told posting on the discussion board was mandatory, while Group B was told posting on the discussion board was encouraged for student learning, but not required or graded. Following the completion of the course, discussion posts were downloaded and qualitatively categorized by content. Student engagement was assessed through type of post including: content sharing, application of content, build-up/encouragement, and clarification, among others. Interrater reliability was maintained by independent coding, paired coding, and randomized consistency checks. Qualitative results will be compared to student’s overall course grade as a measure of student’s overall learning. Results of this study may suggest whether or not there is a learning benefit in mandating online discussion board posts.

A Pilot Study on a Metalinguistic Approach for School-Based Speech and Language Intervention
Adriana Oakland
Faculty Mentors/Collaborators: Vicki Samelson, Gayle Holte

Students with speech-language disorders often struggle to generalize their newly learned speech-language skills to the classroom and home environments. We hypothesize that one reason generalization is challenging is because speech-language pathologists (SLPs) often tend to focus more on the student's speech-language challenges than on talking with the student about strategies to analyze those challenges. The aim of this single-subject pilot study was to determine if using a metalinguistic speech-language therapy approach would help students become more active participants in their learning and generalize new skills more readily. A school-based SLP collaborated with the research team to develop a metalinguistic approach where the SLP and her 4th-grade student would talk about the student's communication challenges, collaboratively create speech-language goals to address those challenges, think aloud about strategies to reach the student's goals, and discuss progress regularly. A mixed qualitative/quantitative data analysis approach will be used to compare the student's interviews, think alouds, and progress at several time points with the SLP's reflections on the meta-linguistic approach. The implications of using a metalinguistic therapy approach to help this 4th-grade student think more deeply about his goals, strategies, and progress will be discussed.

The Role of Mindsets in an Undergraduate Research Course
Erin Zigler, Sophie Grelson
Faculty Mentor/Collaborator: Jerry Hoepner

According to recent research, undergraduates who participate in research early in their programs have positive academic outcomes and become more intentional learners in their subsequent coursework. Experience with undergraduate research improves confidence and understanding of the research process (Brownell & Swanker, 2009; Nagda et al., 1998; Kuh, 2009). In the field of speech language pathology/audiology, the connection between research and clinical practice is prominent. There is some
evidence within Communication Sciences and Disorders (CSD) that students are intimidated by the aspects of research. Research conducted by Dweck and colleagues has shown that a fixed student mindset may constrain their ability to learn about intimidating concepts (Yeager & Dweck, 2012; Dweck, 2006). Students with a fixed mindset withdraw effort in situations as they perceive as difficult (unachievable). Those with growth mindsets believe knowledge is malleable. An investigation was conducted to explore the influence of mindsets in a freshman level course designed to enhance research abilities within CSD. This course used Dweck’s methods to elicit growth mindsets. Within this course, students completed a mindset survey at the beginning and end of the semester. Preliminary analysis of survey data has shown a subtle shift in some student’s mindsets from fixed to growth.

**Communication Sciences and Disorders and Information Systems**

**Portability of the Sandwich Approach Teaching Pedagogy**  
Olivia Vruwink, Brittany Strom, Robert Terrell  
Faculty Mentors/Collaborators: Jerry Hoepner, Jean Pratt  
Poster #: 192

The present investigation examined the portability of a modified flipped classroom approach called the Sandwich approach. The Sandwich approach arose out of the work of faculty in Communication Sciences and Disorders (CSD) given some shortcomings of the flipped classroom approach. A long-term study in CSD revealed better outcomes concerning exam grades, student confidence, and conceptual knowledge in a neuroanatomy course compared to traditional and flipped methods. The present study seeks to replicate those comparisons and implementation of the teaching method within an information systems (IS) course. The study examined four semesters of a single class, IS 310. While early data suggests some resistance to new methods, student confidence and performance is improving. The mixed methods investigation uses qualitative analysis of student evaluation comments in addition to quantitative analysis of performance confidence ratings from exams and projects, and exam/project grade performance within a Sandwich-modified flipped classroom to compare outcomes from prior semesters, which used traditional and flipped approaches. The portability of this instructional technique across unrelated disciplines is an important issue, as positive outcomes in one context does not necessarily assure easy transfer to other contexts with fundamentally different content and skills.

**Education Studies**

**Attitudes Towards Science and Science Teaching – Understanding How Coursework and Practicum Affect Preservice Elementary Teachers**  
Elizabeth Scott  
Faculty Mentor/Collaborator: Victoria Rosin  
Poster #: 165

The aim of the project is to find out how a university elementary science methods course and local in-school (practicum) teaching placement affect university preservice teachers attitudes towards science and science teaching. Researchers have indicated that elementary preservice teachers’ struggle with attitudes towards, and the teaching of, science (Appleton, 2002; Watters & Ginns, 2000; Yates & Goodrum, 1990). A way to improve preservice teacher outcomes for teaching science is to provide positive teaching experiences with science (Cantrell, Young, & Moore, 2003; Ginns & Watters, 1999; Kenny, 2010). To find out whether experiences with science were happening, we used anonymous online surveys and semi-structured interviews with elementary science method students. Surveys revealed a group understanding and semi-structured interviews with some of the preservice teachers after they completed the methods
course and practicum revealed individual progress and how their attitudes were impacted. Our current results indicate that a majority of the preservice teachers were able to teach a science lesson while on practicum. Many preservice teachers, however, still don’t feel comfortable teaching science. The findings are ongoing and indicate which aspects of the university course and practicum are affecting preservice teacher attitudes towards science and science teaching.

Honors Program

Better Preparing Undergraduates by Asking & Listening; Making a Liberal Education a Personally Relevant Education

Ian McAlister
Faculty Mentor/Collaborator: Michael Huggins

While the value of an undergraduate degree today remains high and continues to rise, the structure of higher education is not without significant room for improvement. At the University of Wisconsin - Eau Claire, new liberal education goals prove, upon inspection, to be a significant improvement upon the previous structure - improving flexibility, and adding emphases on creating and connecting. Yet, it remains unclear if these new goals will address many of the concerns of students. As a member of the Better Preparing Undergraduates team of the Fall 2016 Honors Course: Community Leadership, in hopes of enhancing students' capacities to lead successful and fulfilling lives we asked 120 students in a broad survey what they want to learn and what they think would improve the undergraduate experience. Student comments and diversity in interests indicate the desire and need for increasing efforts to make a liberal education a pragmatic and personally relevant education, with greater flexibility to pursue personal projects, and in particular call for a more holistic approach with greater assistance with the transition into professional life via. bringing professional development up to par with intellectual development as a cornerstone of a liberal education and including a professional development goal in LE core. By asking graduating students what their most transformative UW - Eau Claire experiences were, giving them the opportunity to reflect and consider how to share their experiences with future employers in a Senior “Springboard” Seminar, and creating a “Senior Highlight Review” - where students can share the professors, classes, organizations that were the most transformative of their undergraduate experience with the entire UW – Eau Claire community – we can launch seniors towards success, cultivate a shared sense of solidarity, and foster further excellence in the community.

Human Development Center

Fact or Fiction: School Psychologists’ Beliefs about Child Psychology Myths

Casey Hoffman, Anna Weber, Joe Latimer
Faculty Mentor/Collaborator: Michael Axelrod

There are a great number of ideas in child psychology that have been largely discredited (Norcross, Koocher, & Garafalo, 2006). For example, the notion that divorce negatively impacts most children's lives is a commonly held misbelief (Hupp & Jewell, 2015). In fact, existing parent and family variables that rarely change best explain child adjustment problems following divorce (Amato, 2010). Unfortunately, our understanding of people's beliefs about myths related to child psychology is limited to college students and parents (Hupp, Stary, & Jewell, in submission). The purpose of this study was to expand upon Hupp and colleagues' (in submission) work by investigating school psychologists' beliefs...
about child psychology myths and research supported facts. Nothing is currently known about school psychologists’ beliefs about child psychology myths. Given the growing emphasis on evidence based practices in the schools and that fact that many school psychologists are asked to provide guidance on child related issues, it seems important for these professionals to differentiate between child psychology fact and fiction. The consequences of widespread beliefs of child psychology myths are significant. School Psychologists, who hold these myths to be true, might engage in practices that could be detrimental to children. Understanding current beliefs among pre- and practicing professionals might lead to enhanced educational efforts focusing on evidence-based practices and policy changes (e.g., state licensing requirements). The study surveyed approximately 150 practicing school psychologists in the upper Midwest using the Opinions about Kids Scale (OAKS). The OAKS is a 52-item survey developed by Hupp and colleagues (in submission) asking respondents to rate their level of agreement on statements concerning child psychology.

**Kinesiology**

*Reflection on Our Health Education Teaching Experience at the Wisconsin Northwest Regional Juvenile Detention Center*

Daniel Gengebach, Jordan Ellenbecker, Tyler Vogt

Faculty Mentor/Collaborator: Yoonsin Oh

During 2016-2017 academic year, health education teacher education preparation courses at the University of Wisconsin-Eau Claire collaborated with the Wisconsin Northwest Regional Juvenile Detention Center (JDC). Undergraduate students in the course prepared the health lessons and taught middle- and high-school age (10-17 years old) students as a part of course. According to the children’s court services manager, 90 percent of the children and adolescents have not had past success in schools. Further, most of them have made unhealthy decisions in the past. We taught skill-based health education lessons such as interpersonal communication skills (e.g. conflict resolution and refusal skills). Through this experience, we learned that although they are incarcerated, JDC students were not much different from students we saw in the public schools. We also learned to adjust our lessons according to their rules and culture. We were told not to bring any sharp objects such as pens and stapled papers. We also had to adjust our active learning activities because JDC students were allowed to move only one person at a time with their staff’s permission. As a group, we learned to adapt our lessons to our students’ culture and discourse.

**Music and Theatre Arts**

*Learning How to Collaborate Using Music and Theatre*

Clarissa Cleven-Peterson, Brianna Walczak

Faculty Mentors/Collaborators: Jennifer Chapman, Laura Dunbar

Over the course of the Fall Semester 2016, we constructed four standards-based lessons in the content areas of math, English, science and social studies, integrating theatre and music concepts. Our lessons were created to help us understand the collaboration between co-teachers and the effectiveness of student learning due to integration. We hosted two hour-long sessions for Kindergarten through second grade students, focused on math and science. An additional two hour-long sessions were held for third grade through fifth grade students, focusing on English and social studies. After each session, the faculty
mentors had a meeting with us to debrief on the session. Findings included clear, focused transitions between sections in the lesson; student engagement; and comprehensive research-based curriculum that crosses disciplines. We concluded that effective colleague collaboration and content integration results in effective of student learning.

**Psychology**

*Evaluation of Supplemental Math Intervention in a Montessori Context*

Rachel Galloway  
Faculty Mentor/Collaborator: Mary Tusing  
Poster #: 71

Number Rockets (Fuchs, Paulsen & Fuchs, 2014) is a tutor delivered early math program designed for use as a supplemental prevention intervention in first grade. Limited research exists to support the transportability of Number Rockets in diverse educational contexts, such as a Montessori school. The goal of the current project is to evaluate the effectiveness of Number Rockets as a supplemental math intervention for elementary school students in a Montessori setting. Undergraduate and graduate students delivered the tutoring program over a 17-week period. A single case research design was used to evaluate the effectiveness of the program for 6 elementary school students. Specific outcomes evaluated include changes in pre and post assessments of intervention specific math skills and weekly progress monitoring assessments with curriculum-based measurements in math. Results will inform math intervention planning for the school.

*The Use of Brief Experimental Analysis in Identifying Effective Early Reading Interventions*

Jessa Quick, Lauren Brinkman, Joe Latimer  
Faculty Mentor/Collaborator: Melissa Chaffin  
Poster #: 105

The National Center for Educational Statistics found that only thirty-six percent of fourth-grade and thirty-four percent of eighth-grade students performed at or above the proficient level in reading (The Nation’s Report Card, 2015). These students do not have the skills necessary to support them in their education. Research has shown that BEA can be used to identify effective reading fluency interventions for struggling students and that these interventions can be effective when implemented across time (e.g., Eckert et al., 2002, Daly et al., 1999). Only one study to date (Petursdottir et al., 2009) has studied the ability of BEA to identify early reading interventions. The present study examined the use of BEA in identifying effective early reading interventions. Three students entering 1st and 2nd grade were invited to participate in the study occurring over the summer months. BEA procedures were used to identify an intervention strategy for each student. The three intervention strategies assessed were repeated reading, modeling, and goal setting and incentive. Progress was measured bi-weekly using FAST probes in letter sound fluency, decodable word fluency, and oral reading fluency. The results from the study suggest that BEA identified intervention strategies did improve reading performance for all three students.
Student Affairs/Dean of Students

**Qualitative Assessment of Multicultural Competence Development of Participants in Civil Rights Pilgrimage**
Madeleine Vruwink, Cecelia Lewis, Saudamini Agarwal, D'Karlos Craig, Stacey Ibe, Jefferson Hall
Faculty Mentor/Collaborator: Jodi Thesing-Ritter

This study determines the impact of immersion travel experience on students engaged in student teaching practicum on the Civil Rights Pilgrimage (CRP). Researchers analyzed pre- and post-trip interviews with participants currently completing student teaching placements through UW- Eau Claire to assess students’ awareness of their own assumptions, biases, and values; understanding of others’ worldviews; understanding of African-American culture; and awareness of current social justice issues. Researchers compared pre- and post-trip interviews from the data collected to measure growth as an outcome of the ten-day intercultural immersion experience. This study supports the use of quality immersion experiences in American colleges and universities as an educational method for improving multicultural competence development for pre-service teachers.

Health Sciences

American Indian Studies

**The Impacts and Effects of Transracial Adoption on Indigenous Adoptees**
Savannah Rigert
Faculty Mentor/Collaborator: Debra Barker

My first research question is this: What published research exists on the long-term effects on the well being of Native American children who have been adopted by non-Native parents? My second question is this: Are there any published follow-up studies on the emotional well being of the children of these trans-racial adoptees? My project involves completing a literature review and a research design to gather qualitative data on the long-term effects of trans-racial adoption on Indigenous adoptees and their children. I will share my work with Ms. Sandra White Hawk and her Minneapolis-based organization, the First Nations Repatriation Institute, which will actually conduct the interviews and focus group discussions. This group has invited me to assist them in this way in the role of student researcher. As of yet, I have found a number of inconsistencies and gaps in published data on the outcomes of trans-racial adoptions of Native American children. The literature so far suggests that too often the effects are not optimal. The purpose of my completed literature review and research design, involving my academic research and consultations with Ms. White Hawk's research team, aims to supplement the few studies that exist. As a Social Work/AIS major and child of a Yakama parent who was adopted by a non-Native family, I am highly motivated to support the research being done on trans-racial adoptions.
Athletics

The Effect of Hydration Status on King-Devick Concussion Assessment and Symptom Scores in Healthy Collegiate Athletes
Jeremy Amundson, Jessica Reineck, Andrea Patterson, Lydia Stiving, Katherine Fant
Faculty Mentor/Collaborator: Tadd Turnquist

Concussions affect various parts of brain function including but not limited to: reaction time, memory, balance, and vestibular ocular motor control. Vision-related assessments of vestibular ocular motor control have become increasingly popular for concussion diagnosis as an objective measure in recent years. Hydration has been shown to have an effect on athletic performance as well as mood and mental performance; however, the impact of hydration status on vestibular ocular motor control has not been established. This study, therefore, was conducted to investigate the effects of hydration on concussion assessments including the King-Devick test and the Sport Concussion Assessment Tool 3 (SCAT3) symptom score. Thirty Division III collegiate athletes participated in this study. Each participant had two baseline King-Devick tests, a symptom score, and a urine specific gravity (USG) assessment. A King-Devick test and a symptom score were then completed. King-Devick time was found to be greater in a hypohydrated status as compared to a hydrated status. There were also significant differences in symptom score and symptom severity in a hypohydrated state versus a hydrated state. Hypohydration negatively affects symptom scores and King-Devick test time. When using the King-Devick test to assess concussion status, consideration of hydration status is needed.

Biology

Screening for MRSA Capable of mecA Transfer
Allison Brost
Faculty Mentor/Collaborator: Sasha Showsh

Methicillin-resistant Staphylococcus aureus (MRSA) is an antibiotic-resistant strain of the bacterium Staphylococcus aureus that is responsible for many community and hospital-acquired infections worldwide. For this study samples from dogs and various campus locations were screened for the presence of MRSA strains. We collected 39 isolates from 39 dogs (from local Veterinary Hospital) and 67 isolates from various campus locations by plating on Mannitol Salt Agar (MSA) containing oxacillin (4mg/ml). A total of 38 isolates displayed phenotypic characteristics of MRSA and were designated as potential methicillin-donors. One of the isolates was a dog isolate while the rest were from environmental samples. PCR analysis of these isolates determined that only one of the isolates (dog isolate) was a potential MRSA donor while the rest appear to be other staphylococcal species. Further analysis of the lone MRSA isolate determined that it contained a plasmid. We performed a plasmid analysis to further characterize the plasmid. All 38 isolates were screened for their ability to transfer the methicillin-resistance gene (mecA) to methicillin-sensitive, streptomycin and spectinomycin resistant Staphylococcus aureus recipient (SAS 850) by performing conjugation experiments. To date, 28 of the 38 donor isolates have been tested and we have not been able to detect the transfer of mecA under these conditions. Initial plasmid analysis from the dog isolate demonstrated the presence of a large plasmid (>30kb).
Communication Sciences and Disorders

**Anticipated Compliance and Quality of Life Measures for Individuals Consuming Thickened Liquids: Perceptions of Taste, Texture, Palatability, and Enjoyment Given Beverage Appearance**

Jillian Utz
Faculty Mentor/Collaborator: Jerry Hoepner

Anticipated compliance and quality of life measures for individuals consuming thickened liquids: Perceptions of taste, texture, palatability, and enjoyment given beverage appearance.

This study will address: (a) effect appearance has on perceived taste, texture, palatability, and enjoyment of thickened liquids, (b) predicted effects of thickened liquids on quality of life based on duration of time the individual is asked to consume the liquid. The effect of appearance on perceived taste and enjoyment of thickened liquids has little empirical evidence, despite being a common treatment for dysphagia. Additionally, the effect thickened liquids have on quality of life has not been well-studied. Thickened juice was presented in masked/un-masked trials. Participants were prompted to taste each juice and rate a number of factors (taste, texture, etc.). Afterwards, participants were asked to predict their degree of compliance to drink thickened liquids for a specified duration (1 week, 3 years, etc.). Participants were asked to rate their predicted quality of life based on the duration of thickened liquid intake. Finally, participants were asked to describe the extent drinking thickened liquids would have on their life. Data is currently being collected. Conclusions on the objectives of this study have not been made.

**Changes in Communication Interactions and Perceptions of Aphasia: The Communication Partners Program**

Ali Peterson
Faculty Mentor/Collaborator: Thomas Sather

The purpose of this study is to investigate the changes in communication interactions and perceptions of aphasia among student volunteers in the Communication Partners Program (CPP). Aphasia can be defined as a chronic language disorder, typically caused by stroke, which causes the loss of ability to understand or express speech. Aphasia impacts overall communication, social interaction, and psychosocial well-being. In this study, six people with aphasia were matched with trained UW- Eau Claire students to provide bi-weekly opportunities for conversation and social interaction, all at no cost. The researchers will review initial and final recordings of CPP sessions collaboratively with the communication partners in order to gather partners’ reflections on the CPP process and experience. Thematic analysis of partner feedback during video session review will occur, and implications for further CPP based on these analyses will be discussed. Recommendations will be made regarding the utility of the CPP to support student understanding of the aphasia experience, and impact on communication interactions.

**Explorations of the Effects of Manipulating Visual Features of Aided AAC Displays: Implications for Display Design**

Karyn Cmeyla, Alyson Reum, Stephanie Holmes, Madeline Horn
Faculty Mentor/Collaborator: Jennifer Thistle

The purpose of this study was to determine how response time changes over five trials when locating symbols on an AAC array that remains consistent compared to locating symbols on an AAC array that changes each session. SLPs have reported designing AAC displays that utilize consistent symbol location...
to support motor learning. The use of a display that holds symbol location consistent has been shown to accelerate communication in conversational turn-taking and support increased independence for the AAC user. This project examines this practice utilizing experimental controls and comparison groups. Typically developing preschoolers were presented a picture and asked to locate the matching picture on an AAC array. The average response time to locate the match was measured and compared to the contrasting condition across five trials. Response time was significantly faster for those in the consistent group than the variable group by the fifth trial. These preliminary results confirm the clinical practice of designing AAC displays that utilize consistent symbol locations to support motor learning. However, further research should explore symbol sequencing (rather than locating a single symbol), as well as consistent symbol location in AAC users who are not typically developing.

**The Relationship between Non-Nutritive Sucking Use and Speech Sound Development**

**Kacey Yahnke**

Faculty Mentors/Collaborators: Rebecca Jarzynski, Abby Hemmerich  
Poster #: 168

The purpose of this study was to examine the relationship between non-nutritive sucking (NSS) and speech sound development in young children. Non-nutritive sucking is thought to have both positive and negative effects on the populations who adopt its practices. Pacifier use is related to reductions in both the amount of time preterm infants are tube fed and the duration of the infant’s hospital stay (Field, et al., 1982). It is also thought to be related to a reduction in the duration of a child’s restless state and is associated with reduced negative behavioral responses in young children (Mason, Harris, & Blissett, 2005). However, extended NNS use is thought to potentially impact both dentition (Nelson, 2012) and speech sound development (Fox, Dodd, & Howard, 2002; Barbosa, 2009). Participants in this study are 3 and 4-year-old children who had a history of pacifier use. Information about the extent and duration of pacifier use was gathered via a parent questionnaire. The speech sound production of participants will be assessed through administration of a standardized assessment tool. Quantitative information on NNS use and speech sound production will be used to examine the relationship between NNS use and articulatory precision.

**Kinesiology**

**The Acute Effect of a Task-Specific Game on Motor Skills in Children with Disabilities**

**Lauren Zurowski**

Faculty Mentor/Collaborator: Marquell Johnson  
Poster #: 38

The purpose of this project was to examine possible changes in motor skill of children with disabilities after participating in a 5-minute task specific game for a 4-week period. Children with disabilities participate in less physical activity (PA) and their obesity rates are 38% higher when compared to children without disabilities, which can negatively affect their future health and quality of life. Previous research indicates PA programs lasting ≥ 8 weeks improves motor skills in children with disabilities, and PA programs lasting 4 weeks improves motor skills in children without disabilities. Limited research has examined the impact of a short PA program (≤ 4 weeks) on improvement of motor skills in children with disabilities. A total of 20-25 children ages 5-16 will participate in the study. Pre- and post-assessment will examine their dynamic balance, object control, and locomotor skills utilizing assessment items from the MABC-2 and TGMD-2. Data collection and analyses will take place during March & April of 2017.
dependent paired sample T-test will examine pre- and post-assessment outcomes. Results from the study could provide insight regarding the usefulness of an acute PA program on the motor skills of children with disabilities.

**Comparison of Heart Rate Response, Rate of Perceived Exertion, and Psychological Attitude During Land- vs. Water-Based Exercise Among Collegiate Club Sport Athletes**

Sara Schmitz, Janna Fjelstad, Zachary Shepherd, Justin Smith, Amanda Ward

Faculty Mentor/Collaborator: Robert Stow

Poster #: 24

Aquatic therapy is used for patients with weight bearing restrictions however, limited research has been conducted to assess athlete’s attitudes towards water-based exercise. The aim of the present study was to compare heart rate (HR) response, rate of perceived exertion (RPE), and psychological attitude towards exercise in water vs. on land. Methods: Fourteen female collegiate club athletes (ages 18-22 years) participated in this study. Each participant underwent two identical circuit-based sessions, in water and on land (counter-balanced order) comprised of seven different exercises. HR and RPE were recorded during these sessions. Following completion of both sessions, participants completed a survey rating enjoyment levels. Results: Paired samples t tests, using an alpha level of .05, revealed significant differences in HR values for all seven exercises performed (p<.05). More specifically, HR and RPE values were significantly greater during exercises on land. The psychological survey found that 5 of the 14 participants (35.7%) preferred the water-based exercise medium. Conclusions: Land-based exercise induced higher HR and RPE compared to water-based exercise. While the psychological survey revealed fewer participants preferred the water-based session, a majority reported enjoyment. These results can be utilized during an exercise program to boost enjoyment and adherence.

**Perceptions of Pokémon Go on Health**

Gracia Clark, Allison Brunett

Faculty Mentor/Collaborator: Yoonsin Oh

Poster #: 39

The purpose of this study is to analyze perceptions on health when Pokémon Go players tweeted about the game. Pokémon Go is an augmented reality exergame that requires players to travel to accomplish game goals. News outlets (e.g., Oliver, 2016) have reported Pokémon Go players sharing on twitter how this game has motivated them to be physically active. However, no study has been conducted to examine the actual amount of tweets expressing players’ perceptions of the game on health. In this study, researchers collected publicly available tweets by using an advanced search of hashtags to get a consistent pool (e.g. #PokémonGo & #walking). Tweets were collected from one week out of each month from July 2016 through January 2017. Based on grounded theory (Glaser & Strauss, 1967), qualitative analysis methods were used for categorization. We numbered and coded the tweets to determine how players who tweeted might perceive the game on health topics. About 29% of tweets reflected positively on physical health, and 15% indicated the person tweeting increased their physical activity by playing Pokémon Go. Tweets with positive perception on physical health were not representative of a large amount of the tweets collected.
Validation of Phone Applications on Measuring Passive and Functional Range of Motion
Michelle Murphy, Collin Groves, Rachel Heffel, Jacqueline Evans
Faculty Mentor/Collaborator: Robert Stow

The study’s purpose is to assess lower extremity (LE) measurements among three different devices. A universal goniometer, Hudl phone application and iPhone 5C Default compass phone application were used. Methods: College age subjects of good health volunteered however, subjects with a significant LE injury within the past 2 years or who cannot hold a squat position for all measurements to be taken are rejected from the study. Subjects’ bony landmarks are indicated with stickers, to ensure consistency. Passive range of motion (ROM) assessments are taken at the hip, knee and ankle of the right LE. Subjects then perform a squat, reaching near parallel with the ground where ROM measurements are taken at the 3 joints. Measurements are taken with the universal goniometer, Hudl and Default compass phone applications. To find statistical significance, the paired-sample T-test as well as One-way ANOVA are used in the analysis of our data collected. Results: A relationship was noted between the accuracy of the three methods of ROM assessments. Conclusion: Our findings suggest Hudl and Default compass phone applications are as accurate as the universal goniometer. These results are dependant on the size of the angle observed at each particular joint. This could be beneficial to the practicing clinician as another method to obtain and document patient changes in range of motion that is quicker and easier to obtain.

Management and Marketing

The 2016 National Emerging Leadership Summit: Advancing Our Profession, Enhancing Lives
Luke Jackson
Faculty Mentors/Collaborators: Kevin Hansen, Douglas Olson

With the growing population of older adults, there is a demand for health and aging services. In 2015, 14.9% of the population was 65 and older (U.S. Census Bureau). By 2050, there will be about 27 million individuals receiving long-term services and supports (U.S. Department of Health and Human Services and Department of Labor). The NELS Summit provides a platform for leaders in health and aging services to increase, and support the value of the health and aging services profession. The purpose of NELS is to identify current important issues affecting the profession, meet and network with representatives from key professional organizations, and gain insight into the legislative process. During the Summit, NELS participants identified two main issues during the Summit and following its conclusion: accountability of NELS participants and enhanced workforce recruitment. The 2016 NELS Summit identified key issues and developed action plans, as well as a refined purpose for the Summit, changing the holy grail to "Advancing Our Profession, Enhancing Lives." The future of health and aging services can benefit from work conducted at the NELS Summit, as it continues to provide exposure to the field as these emerging leaders better understand their roles in this growing profession.
**Evaluating the Use of Technology in Long-Term Care Settings**  
Allison Prouty  
Faculty Mentors/Collaborators: Kevin Hansen, Jennifer Johs-Artisensi  
Poster #: 216

As the technology industry continues to grow, there are few studies analyzing the implementation of technology in health and aging services communities. The objective of this research project was to gather information from a sample of nursing homes (NHs) to determine what technology improves quality of care, quality of life, internal communication, and external communication. The sample surveyed 52 NHs in the Midwest, inquiring how their use of technology affects residents, family members, staff members, and external partners. Preliminary results show that use of phone, fax and email for communication remain the most widely used forms of technology. Other preliminary results showed NH use of technology in a variety of ways: video conferencing was utilized more for social interaction (66.67%) than care conferences (50.9%); about 54.9% of NHs had some form of technology use to enhance staff members’ health and wellness; and around 82.35% of NHs are using cell phones for communication with staff members or for services offered onsite. While more in-depth results will be reported in the poster, this research discovered new data to represent how prevalent the implementation of technology is in long-term care settings, incorporating two of the largest growing industries: technology and long-term care.

**Expanding and Enhancing Senior Care University Programs Nationwide**  
Katelyn Mrozek  
Faculty Mentor/Collaborator: Douglas Olson  
Poster #: 206

The field of health care administration in senior care education lacks a strong portfolio of educational programs across the United States. Facing a growing senior population and an urge to transform the current landscape of care for older adults, development of well-prepared, strong leaders in the health care administration field needs to happen. Additionally, more administrators are leaving the profession than entering. One essential piece in developing leaders is an availability of strong university-based senior care programs. This project will approach multiple stakeholders with a variety of approaches to get feedback on challenges and opportunities facing the development of new university-based programs and the expansion of existing programs. This feedback and information will be shared, and the synthesis of this information will be used, to help an advisory committee advance a national plan to expand senior care administration programs. This project will present a strategic plan on how to create a network of unified senior care programs across the nation, including a list of the goals to achieve each. Utilizing the results from this study, it will be possible to work with existing university programs and new programs to create unified and strong long-term care programs to address the needs.

**Key Attributes and Potential Barriers of Long Term Care Administration Programs**  
Alyssa Schwall  
Faculty Mentor/Collaborator: Jennifer Johs-Artisensi  
Poster #: 215

The purpose of this research project was to identify what components are necessary to create a strong long term care administration program. By reviewing redacted data of NAB accredited academic programs we were able to identify robust characteristics of programs. Using an inductive qualitative approach, data related to curriculum, student, faculty, partnerships, field experience, and “other” were extracted in categories of the Strengths, Weaknesses, Opportunities, and Threats (SWOT). The data was then analyzed to identify key strengths and common threats. Some key findings are that connection with the profession is critical, including a strong AIT/internship component of at least 1000 hours, and engagement throughout the curriculum from practitioners across the care continuum. Programs also need
internal university support and dedicated faculty, and must have a strong marketing/student recruitment approach to ensure a sizable enrollment. In addition to identifying several key characteristics and features of strong long term care administration academic programs, opportunities for improvement, and some common threats were identified, which is beneficial to all programs wishing to improve. This report offers valuable insights for consideration of potential structural changes to the NAB accreditation process.

**Nursing**

**Educating Women about Complementary and Alternative Medicine Interventions to Promote Wellness in the Postpartum Period**  
**Kelsey Stoinski, Angel Schmidt, Misty Howland**  
Faculty Mentor/Collaborator: **Rachael Haupt-Harrington**  
Poster #: 107

This nursing honors project centers around educating women about the causes and effects of stress, and utilizing complementary and alternative medicine (CAM) interventions to promote wellness in the postpartum period and throughout life. A scholarly literature review identified evidence-based CAM interventions, such as relaxation techniques that promote wellness and effectively decrease stress in postpartum women. An article of specific interest is entitled "Relaxation during pregnancy: What are the benefits for mother, fetus, and newborn?" (Fink, 2012). The authors reviewed several research studies related to relaxation techniques, such as: massage, guided imagery, and yoga, and discussed their effects on mothers and babies before and after birth. Evidence resulting from the literature review, identifies the need to educate postpartum women on relaxation techniques to help promote health and wellness. A presentation and/or pamphlet detailing the evidence-based relaxation techniques will be used to educate attendees at various local community and/or healthcare settings, to include but not limited to: YMCAs, daycares, new mother organizations, and birthing units. The goal of this work is to deliver CAM intervention information in the hopes of better supporting women’s wellness throughout the postpartum period and thereafter.

**Evidence-Based Project: Proposal to Support Establishment of a Baby Café Site**  
**Brianna Mader, Courtney Kommer, Katrina Chu, Jordan Veloso, Brooke Doll, Stephanie Corry, Michael Berry, Emily Gyorog, Jennica Jahnke, Sydney Halley**  
Faculty Mentor/Collaborator: **Rita Sperstad**  
Poster #: 196

This group of junior 2 nursing students has developed an evidence-based project to fulfill nursing elective credits for the University Honors program. Women and infant professional organizations recommend exclusive breastfeeding as the ideal method for feeding the infant during the first 6 months and continue for one year. However, data indicate the Healthy People 2020 goals for breastfeeding are not meeting set benchmarks. In collaboration with a local health care partner, a need for evidence to support the implementation of a Baby Café resource site for pregnant and breastfeeding mothers was identified. Established in 2011, the Baby Café is a national network of free breastfeeding drop-in sites. In a non-clinical, café style environment, parents can learn about breastfeeding from certified skilled practitioners and each other (http://babycafeusa.org/images/press-releases/baby-cafe-press-release.pdf). The question of inquiry for this research is: What is the evidence to support the initiation of a Baby Café site? The purpose of this project is to conduct a scholarly review of literature focused on evidence to support the need and benefit of implementing a Baby Café site. Students will critique, analyze and schematize effective evidence to answer the research question. A written proposal will be created by the students and disseminated to clinical partner stakeholders.
Nurse Practitioner’s Use of Standardized Nursing Language: A Literature Review
Larissa Furger  
Faculty Mentor/Collaborator: Shelley-Rae Pehler  
Poster #: 225

Since APRNs primarily document using medical language (ICD-10), the nursing care APRNs provide is currently invisible. In addition, most electronic health records do not incorporate standardized nursing language and lack widespread reimbursement for the advanced nursing care provided. A literature review was aimed to examine how advance practice nurse practitioners (APRN) are currently using standardized nursing language (SNL) to document their advanced practice nursing interventions in a primary care setting. CINAHL and MEDLINE were searched using nurse practitioner, documentation, barriers, electronic medical record, nursing standardized language and standardized language as search terms. No limits of years were imposed during the search. Articles were reviewed and kept if they met inclusion criteria specific to nurse practitioner practice and standardized nursing languages. Two reviewers independently reviewed each article. Results: Published articles fell into three broad categories: 1. barriers of using SNLs by APRNs, 2. listing of nursing interventions using the American Nurses Association approved SNLs, and 3. single case studies to demonstrate use of SNL by APRNs. The need to overcome the barriers and show how SNLs can be linked to reimbursement is required before the advanced nursing care provided by APRNs can be further studied for the impact on patient outcomes.

Psychology and Kinesiology

Association between Body Image and Injury Rate in Division III Athletes  
Molly Hart, Nicholas Hubbard, Brianna Jensen, Maegan Olson, Travis Stargardt,  
Faculty Mentors/Collaborators: Jennifer Muehlenkamp, Saori Braun  
Poster #: 102

Body image is a multidimensional psychological aspect for all human beings. There has been research done looking at multiple different aspects of body image, but falls short when comparing body image and injury rate. The purpose of this study is to look further into body image and see if there is a correlation between body image and injury rate. Participants will be pulled from a midwestern division three university and will have participated in either men’s ice hockey, women’s ice hockey, men’s basketball, women’s basketball, men’s and women’s swim and dive, wrestling and gymnastics. They will be asked to fill out the Multidimensional Body-Self Relations Questionnaire, which is a 69-question questionnaire measuring body image. Along with this the participants will fill out a self-report on injuries. We will be conducting our research on March 16, 2016 and we will conclude on April 18, 2017. Our hypothesis is when an athlete has a more negative body image the rate of injury will be increased.

Watershed Institute

Measuring Airborne Particulate Concentrations in Two Wisconsin Towns Hosting Frac Sand Facilities  
Benjamin Kleist, Jacob Kentnich, Ethan Fuhrman, Maryanne Cowart, Peter Husnik  
Faculty Mentor/Collaborator: Crispin Pierce  
Poster #: 21

The UWEC Environmental Public Health Dept. air quality research team led by Dr. Crispin Pierce has been measuring airborne particulates (dust) in Bloomer and New Auburn WI. The team has been recording concentrations of both PM2.5 and PM10 which are subject to National Ambient Air Quality
Standards through the Clean Air Act. Health effects associated with long term exposure to PM2.5 include lung disease, lung cancer, and cardiovascular disease. Our team goal is to monitor airborne particulate concentrations to protect the public against related health effects. Both monitoring locations were chosen based upon EPA siting criteria, and measurements were performed by EPA-certified dichotomous samplers. The sampler in Bloomer recorded concentrations of PM2.5 averaging 7.41ug/m3, with a PM10 concentration of 24.2ug/m3 over a two-year period. New Auburn was monitored for 10.5 months and experienced average PM2.5 concentrations of 22.7ug/m3, along with PM10 concentrations of 49.0ug/m3. Results from both sites indicate PM2.5 levels above concurrent background levels reported by the Wisconsin Department of Natural Resources. The average and 98th percentile PM2.5 levels, and second-highest PM10 level in New Auburn were higher than corresponding EPA standards. The state of Wisconsin currently hosts 128 industrial sand mines, 92 of which are active. Of these 92 facilities only 20 report PM10 concentration data to the Wisconsin DNR, but leave out PM2.5.

**Source Investigation of Nitrate Contamination in Private Wells in Eau Claire County, WI**
Breanna Rheinschmidt, Jenna Ouradnik, Rachel Kennedy, Dexter Zebro, Olivia Feider, Mitchell Vandenmeerendonk
Faculty Mentor/Collaborator: Laura Suppes
Poster #: 10

This study is designed to identify sources of nitrate contamination in private well water in Eau Claire County, WI. Nitrate from septic system discharge and agricultural application can contaminate ground water used by homeowners as potable water. Nitrate levels above 10 ppm in drinking water can lead to adverse health effects like Blue Baby Syndrome. Two hundred private wells in Eau Claire County with historically elevated nitrate levels (>5 ppm) will be surveyed for 14 compounds that indicate agricultural or human wastewater contamination, including atrazine, alachlor, caffeine and acetaminophen. Risk factors of nitrate contamination will be assessed using a survey that collects information on presence of used or abandoned septic systems, historical and current fertilizer storage or use, well condition and other factors that influence nitrate concentrations in well water. To date, 24 water samples have been collected and analyzed. Twenty-five percent (6/24) of the analyzed samples contained low concentrations of agricultural compounds. Eight percent (2/24) of samples contained human wastewater indicators (caffeine), and one of those samples contained both caffeine and agricultural indicators. Data analysis is ongoing and expected to be complete by fall, 2017.

**The Science Behind Internet Claims: Are Toilet Seats Really Cleaner than Reusable Water Bottles?**
Megan Ballweg, Chesney Thompson
Faculty Mentor/Collaborator: Laura Suppes
Poster #: 40

This research explores the cleanliness of reusable water bottles compared to toilet seats. Claims on the Internet unsupported by research state reusable water bottles harbor more bacteria than toilet seats. The objective of this study was to determine if these claims are accurate. Thirty reusable water bottles and 30 toilet seats were swab sampled for Heterotrophic Plate Count at the University of Wisconsin-Eau Claire campus to compare cleanliness. Equal areas of the toilet seats and the interior of reusable water bottles were swabbed with sterile cotton-tipped applicators. Swab samples were plated directly onto Tryptic Soy Agar on-site then incubated at 35°C and counted after 48 h. Reusable water bottles on average had 116 more heterotrophs per square inch than toilet seats, which was significant at the 95% confidence level. This research suggests online claims stating reusable water bottles are dirtier than toilet seats are accurate.
Humanities

American Indian Studies

*The Search for Identity in Native American Literature*

Brianna Kosmer

Faculty Mentor/Collaborator: Heather Moody

Poster #: 224

The topic of identity is central not only to literature, but to human existence, for each character or person has a unique identity that is formed in different ways, from different factors. My research follows the journey of identity for the main characters in four Native American literary works of fiction and aims to identify a four-step process of identity through these characters’ journeys. Through this research, I hope to demonstrate what constitutes an identity that is formed from a crossing of cultures. Within the four Native American works of fiction I selected, I tracked each character’s journey; I noted similarities in the actions taken by each character, what happens to him or her, and the reactions to these experiences. I was then able to organize these observations into four steps creating a process that each character undergoes in order to form his or her identity. Through tracing these steps in the four literary works and analyzing the outcomes that these steps have on the characters, I seek to draw conclusions about the complexity of Native American identity and the topic of identity as a whole.

Art and Design, Watershed Institute, and History

*Sustaining Prater Park: UNESCO World Heritage Site Proposal*

Alyssa Westphal, Clarissa Moschkau, Brittney Rohlik

Faculty Mentors/Collaborators: Jill Olm, Karen Mumford, James Oberly

Poster #: 58

This proposal advocates for Prater Park in Vienna, Austria to receive the UNESCO (United Nations Educational, Scientific and Cultural Organization) World Heritage site designation. The proposal highlights UNESCO’s designation criteria as demonstrated in the physical environment and social use of the space. Through examination of the historical and contemporary functions of Prater Park, the team made strong connections to UNESCO World Heritage’s mission. Visiting Vienna during summer of 2016, the team was able to investigate firsthand the Viennese atmosphere and values reflected in the park. For over 250 years Prater Park, or Wiener Prater, has served as a site for the interchange of human values through technological developments, environmental progressions, and creative place-making. The World Heritage designation would provide economic, environmental and historical protections and restorations for Vienna’s cultural sustainability.

Communication and Journalism

*The Hollywood Gloss of Nixon and Frost: The Influence of Film on Public Perception of Journalism and “The Nixon Interviews with David Frost”*

Erica Nerbonne, Nicole Bellford, Courtney Pagel, Conner Demchuk, Ashley Duerr

Faculty Mentor/Collaborator: Jan Larson

Poster #: 64
This project focuses on how the Hollywood portrayal of David Frost’s 1977 interview with Richard Nixon in the film *Frost/Nixon* impacts the public’s perception of journalism and of “The Nixon Interviews.” The research includes an analysis of the journalistic principles truth and accuracy, monitoring power, and the public’s right to information through the application of George Gerbner’s Cultivation Theory. The effects on the public were measured by examining pre-existing attitude polls about the press. These polls were compared to recurrent messages of the film and film reviews. While the findings are correlational in nature, the improvement in how the public views journalists and Nixon illustrates film’s possible impact on public perception. This study can perhaps be used to better understand Hollywood’s influence on how the public views journalism and to consider the role of films in the press-public relationship.

**English**

*Guide to LGBTQ+ Friendly Service Providers in the Chippewa Valley*

**Alexander DeLakis**  
Faculty Mentor/Collaborator: **Theresa Kemp**  
Poster #: 166

Working in collaboration with the Safe Spaces Coalition of Chippewa Valley, our project provides a listing of local LGBTQ+ affirming service providers. The impetus for our work are the conclusions drawn by the 2013 Wisconsin Youth Risk Behavior Survey and the US CDC, both which reveal LGBTQ+ people face health disparities in accessing equitable healthcare: Because providers may be consciously or unconsciously biased, fear of discrimination may lead LGBTQ+ people to avoid seeking healthcare. Consequently, the US Department of Health and Human Services recommends that healthcare providers develop cultural competency regarding sexual orientation and gender identity in order to “enhance the patient-provider interaction and regular use of care.” Our Resource Guide aims to assist LGBTQ+ people in locating culturally competent care providers in our community. Using anonymous surveys (electronic and in print), people who self-identified as LGBTQ+ were asked to recommend service providers who they: 1) were ‘out’ to; 2) feel comfortable discussing their sexuality and/or gender identity with; 3) feel are knowledgeable on issues regarding sexuality and/or gender; 4) and would recommend to other LGBTQ+ people. The Resource Guide will be published (and periodically updated) on the Safe Spaces website (http://www.safespacescv.org).

**Hokkien in Penang, Malaysia: Struggles of a Minor Language**

**Carmen Lim**  
Faculty Mentor/Collaborator: **Lynsey Wolter**  
Poster #: 167

The long term goal for this project is to preserve and possibly revitalize Penang Hokkien in the future by introducing a writing system that works well for the community, as well as raising awareness about the values of minor languages. Meanwhile, the short term goal is to tentatively propose a writing system for Penang Hokkien. Main ideas for this project are incorporated from my previous research, about why languages die and why we should care. After reading books such as Vanishing Voices and Southern Min (Hokkien) as a Migrating Language, it is made clear that a language can be revived as long it is well preserved. Through my research, I have learned the origins of Hokkien, the various dialects, tones, vowels and consonants. I have also collected a decent amount of text messages that were written by younger speakers of Penang Hokkien. By analysing these texts, I can determine the spelling rules that the native speakers already follow and compare these to existing writing systems for other dialects of Hokkien such
as Pēh-ōe-jī and Modern Literal Taiwanese (MLT). With all the information and data, a useful and standardized writing system can be developed for the native speakers of Penang Hokkien.

**Linguistic Links in Murderer Manifestos**

Makenzie Relford

Faculty Mentor/Collaborator: Erica Benson

Poster #: 195

The purpose of this study was to examine existing research that has been done on manifestos of murderers and to explore linguistic similarities in the texts of three murderers - Theodore Kaczynski, Elliot Rodger, and Dylann Roof. Using textual analysis to identify specific linguistic features, I explored the linguistic characteristics that these individual killers exploit in their manifestos and the commonalities among these authors. The findings suggest that while there are some linguistic similarities between these three texts, there are fewer similarities than hypothesized and the differences--both linguistic and nonlinguistic--are much more apparent. I conclude that the manifesto genre is fluid and that some manifestos can be considered a type of suicide note because the criminal author understands that they can be caught and would rather die than be controlled by the law. This study addresses the current lack of literature and research on murderer manifestos and makes a contribution to the discussion. Further research would benefit from integrating the English Linguistics, Criminal Justice, Psychology, and Sociology disciplines to create a multi-focused study.

**The Past Tense Morpheme with a Focus on the Elegies of Anne Bradstreet**

Lisa Krawczyk

Faculty Mentor/Collaborator: Erica Benson

Poster #: 106

The past tense morpheme in English, regularly spelled in present-day English as “-ed” (e.g., “walked”, “loved”), in Early Modern English had a number of spelling variations, for example, “-ed”, “-t”, and “-d” sometimes with or without an apostrophe. Previous research has not found a pattern (e.g., Gustafsson 2002). In an effort to discover a pattern, we looked at the elegies written by Anne Bradstreet, who wrote during the Early Modern English period, a transitional period between idiosyncratic and standardized spelling, to research factors that may have influenced the appearance of the variant forms of (-ed). By focusing on the work of a single author, we have examined specific linguistic, sociolinguistic, and nonlinguistic factors that may influence the representation of the past tense morpheme (-ed).

**History**

**Princes, Peasants and Counterrevolution in Late 18th Century France: A Social Network Approach**

Amanda Krueger

Faculty Mentor/Collaborator: Patricia Turner

Poster #: 5

The counterrevolutionary movement against the French Revolution (1789-1799) in the northwestern province of Brittany is usually characterized as a series of disparate, ineffective efforts with different goals and means of achieving them. Standard accounts, however, fail to account for the movement’s remarkable persistence. Specifically, the two main groups, the Association Bretonne and the Chouannerie, are viewed as having distinct, largely separate histories due to their disparate chronologies and class origins. The Association Bretonne, led primarily by the Breton elite, functioned as a top-down secret society that officially disbanded after the death of its leader in January 1793. The second group, the Chouannerie, functioned mainly as a bottom-up insurgency that mobilized the Breton peasantry beginning
in late spring 1793. This project reassesses standard understandings of these two counterrevolutionary
groups by using social network analysis to trace and interpret the political connections of one British
officer, the Prince of Bouillon, who was governor of the Island of Jersey during the French Revolution.
His extensive networks reveal multiple intersections between the two groups, suggesting that their shared
strategies, personnel and resources – combined with ongoing efforts to gain British support – can help
explain the longevity of the counterrevolutionary movement in Brittany and why it endured even after the
French Revolution had failed.

**History and Languages**

*Wir bleiben hier! History, Memory, Aging, and Civic Activism in Berlin*

**Hannah Schneeman**
Faculty Mentors/Collaborators: Teresa Sanislo, Joshua Brown

This project explored connections between collective memory formation, identity politics, and civic
engagement in Prenzlauer Berg. Prenzlauer Berg, near central Berlin and formerly part of communist East
Germany, has experienced rapid gentrification since the fall of the Berlin Wall. The research team worked
to explain how a senior center came to financially, administratively, and socially support a house museum
that showcases middle and working class life of Berliners in the early 1900s. The center, Herbstlaube,
runs the museum with the Prenzlauer Berg District History Museum, a governmentally funded institution.
We asked why this museum became meaningful for its staff, volunteers, and others who defend it against
gentrification. To answer these questions, the team collected and analyzed materials from the district
museum archives and interviewed archivists, museum staff and local politicians. We collected oral
histories and documents from the museum’s and senior center’s staff and volunteers. We traced activists’
histories that established the senior center and took on the museum’s administration and financing, and
linked their activism to left leaning East German political responses to reunification. The senior center
and museum serve to construct and express a local identity that is grounded in memories and belonging in
former East Berlin.

**Languages**

*Ancient Egypt’s Religious Need for Mathematics*

**Danielle Brushaber**
Faculty Mentor/Collaborator: Matthew Waters

Ancient Egyptians are known for their exceptional mathematical advancements. What inspired this
development? Through assessment of ancient texts on mathematics and recognizing the application of the
advancements, it is clear that religion played a key role. For the ancient Egyptians, mathematics was
essential for religious expression. Innovations in geometry were necessary to build religious monuments
and the pyramids. More conceptually, scientific understanding contributed crucial insight about the state
of harmony on earth. This harmony, called ma’at, was a central concept in Egyptian religion, describing
the level of order established by the gods. Studying the inundation of the Nile using nilometers was
critical in the awareness of ma’at, not only for crops (and therefore the economy), but for the adjustment
of religious behavior to satisfy the gods. Egyptian state scribes were responsible for much of the process:
monitoring and helping to guide reactions to change. Scribes used their mathematical competence to
study the state of ma’at, representing a meeting of science and religion in ancient Egypt.
Chinese Students Perceptions of American English Teachers (ESL) in Comparison with Chinese English Teachers (ESL)
Delaney Cooley, Katherine Kocen
Faculty Mentor/Collaborator: Kaishan Kong

The purpose of this project was to study Chinese student’s perceptions of American English teachers including the advantages and disadvantages found in the teaching style differences between Chinese and American teachers. Through conducting this research we hope to explore Chinese students preferences in learning English. During a three-week English program summer camp we taught twenty-four Chinese students in two different groups separated by their English proficiency. The summer camp is located in Chengdu, China and consisted of students coming from underprivileged rural areas chosen to participate in this educational opportunity. The Chinese students ranged in age from twelve to sixteen years old.
The camp consisted of eight teachers in total three being American college students and the additional five being Chinese native speakers with high English proficiency. All the teachers involved in the camp were teaching on a volunteer basis without certified teaching license, there was however guidance from teaching professionals. Students had at least one class taught by an American teacher each day in the course of a week in addition to having classes taught by Chinese teachers. While conducting our research we noticed classroom atmospheres were different between Chinese and American teachers where the Chinese teachers were more instructive and the American teachers were more interactive with the students. In the instructive classrooms the teaching style was more formal in that the teachers presented the information and the students repeated it back to them. The interactive classrooms consisted of games with the students as well as more student interactions with each other and the instructor. The Chinese students were more familiar with the teaching style of the Chinese instructors and were initially unaccustomed to the American teaching style. The results in this research indicate that Chinese students perceive both Chinese and American teachers to be helpful in their acquisition of English.

Globalization in China: Developing Language and Cultural Understanding through Study Abroad
Katelyn Kannel, Amanda Bower
Faculty Mentor/Collaborator: Kaishan Kong

As study abroad has become an increasingly common practice for American students, existing scholarship in this field has extended from measuring pure linguistic gains to studying the integration of cultural and linguistic impact on participants. It is argued that study abroad is one of the best ways for students to experience first-hand the interconnectedness of language and culture (Gorka & Niesenbaum, 2001). This process may be challenging, as Mezirow (2000) identifies as disorienting dilemma, but it is helpful to nurture learners’ multiple skills, including world mindedness, independence, tolerance for ambiguity, self-esteem, empathy and research skills (Barkin 2016). Drawing from multiple bodies of literature on sociocultural perspectives (Lantolf, 2000; Vygotsky, 1978), transformative learning (Mezirow, 2000) and study abroad, this qualitative case study investigates how a short-term immersion study abroad program in China has helped American students to develop their understanding of Chinese culture and inspired them to reflect on their own culture. Multiple data sources include semi-structured interviews, participants’ journals, reflection papers and on-line blogging. Through this, the researchers discover several preliminary themes, including (1) participants’ appreciation of learning partners; (2) participants’ appreciation for Chinese collectivist thinking; (3) participants’ development of critical perspectives on the target culture and home culture; and (4) participants’ motivation for language learning and future careers. This study is significant in three major aspects: (1) This case study examines the impact on both language and non-language learners. It seeks answers on how they learn through everyday verbal and non-verbal
interactions. (2) This case study is situated in a short term immersion program in China, a country that is increasingly popular among sojourners. (3) This study, instead of using quantitative data, utilizes multiple sets of data to reveal participants’ holistic growth in learning. The results will be illuminating to faculty on future development of study abroad programs.

**Migrants and Refugees in the Austrian School System**  
Seth Kreibich  
Faculty Mentor/Collaborator: Martina Lindseth  
Poster #: 162

Austria, like many countries, has recently seen an influx of migrants and refugees. As part of Austria’s integration plan, migrants and refugees are legally required to learn the German language. The purpose of this project was to research how migrants and refugees are being integrated into Austrian schools and society, specifically with regard to expectations and regulations concerning their German skills. We first analyzed relevant government documents at the federal, state, and local levels, preparing English translations and summarizing the main points. In order to gauge the subjective effects of these laws on schoolteachers, the student researcher made contact with a number of schools while in Austria. We then collaborated online to create and distribute an online survey to schools throughout the country. The findings indicate that the majority of schoolteachers felt positive about their school - which includes supports and opportunities to overcome language barriers. They also shared positive views of both local and immigrant students, with their opinions of immigrant children being slightly more positive than those of local students. The data provides insight into the functionality and effectiveness of Austrian immigration policy with regard to linguistic and cultural integration.

**Math and Computer Science**

**Computer Science**

**DBQA - A Visualized, Data-Oriented SQL Query Teaching Tool**  
Esther Gutzmer  
Faculty Mentor/Collaborator: Ryan Hardt  
Poster #: 113

While SQL has a relatively simple syntax with a small set of commands, it allows for complex query construction that is deceptively challenging. SQL is often the first declarative programming language learned by students, which requires a different analysis approach than that used to understand procedural or object-oriented programming paradigms. Our tool, “Database Query Analyzer” (DBQA), uses a step-by-step analysis approach to evaluate the effects that clauses and conditions in an SQL SELECT statement have on its result set. This approach mimics programming paradigms already familiar to most students in an introductory database course. Unlike similar tools, DBQA has support for subqueries, which have been shown to be among the most difficult queries for students to construct. We plan to test our theory that this approach will increase students’ ability to write and debug SQL queries, particularly those consisting of joins and subqueries, using a controlled experiment. DBQA currently has partial support for subqueries and set operations and full support for all other clauses (including JOINS) and conditions.
### Mathematics

**Algebras Associated with the Hasse Graphs of Polytopes**  
**Austin Holmes, Geoffrey Glover, Tennie Jacobson**  
Faculty Mentor/Collaborator: *Colleen Duffy*  
Poster #: 208

The main goal of our project is to determine the structures of the graded algebras that are associated to the Hasse graphs of polytopes. Previous work has determined the structure for many polytopes; this year we are studying the 600-cell, which is the four-dimensional analog to the icosahedron. The algebra is formed by looking at paths between distinct vertices in the graph. For each symmetry of the 600-cell, we consider the Hasse subgraph consisting of fixed $k$-faces of the 600-cell under the action of the symmetry. The number of directed paths between each pair of levels in the Hasse subgraph determines the generating function for the sub-algebra, which in turn gives us its graded dimension. Knowing these graded dimensions for each sub-algebra associated to each symmetry allows us to describe the algebra. We are primarily using Maple (which is a numeric and symbolic software) to count the number of fixed $k$-faces and their containments, and subsequently the number of paths, for each symmetry.

### Statistical Analysis of Adoption Patterns in Four US States

**Danielle Brushaber**  
Faculty Mentor/Collaborator: *Abra Brisbin*  
Poster #: 181

Caring for people, especially children, who do not have a home is a common value across religions and cultures. Adoption and foster care have provided stability to millions of children in the US alone. To identify factors which influence adoption rates, we analyzed data from the 2014 American Community Survey in four states: Wisconsin, Minnesota, Texas, and California. Previous research indicates that some ethnic groups have high rates of informal adoption, which may result in lower formal adoption rates among those groups. Unexpectedly, we found that Hispanic and black families adopt proportionally more than other families in California. However, in Texas, black families have a lower than expected adoption rate compared to families of other ethnicities. These findings may point to varying efforts in different states to formalize informal adoption. Another common perception is that adoption requires an exceptional income; our research supports this perception, with higher adoption rates among families with above-median incomes in all four states. Finally, we used spatial analyses and a permutation test to investigate whether neighboring regions influence each other’s adoption rates. This hypothesis was not supported by the data in Wisconsin. We will also discuss spatial and permutation analyses of other states.

### Analysis of Combining Musical Scale Vectors

**Emily Gullerud**  
Faculty Mentors/Collaborators: *James Walker, Gary Don*  
Poster #: 239

This interdisciplinary project uses mathematics to represent musically significant collections of notes such as scales, chords, and intervals as combinations of each other. These note collections were converted into one-dimensional vectors so that matrices could be used to solve the systems of linear equations which create the combinations, a method used in one of Sethares’ papers (“An algebra for periodic rhythms and scales.” Journal of Mathematics and Music, 5(3), 2011, pp. 149-169). In some cases, this method produces combinations which are too complex to have musical significance, so a new iterative method has been devised to create simpler combinations. All the mathematics used has been coded into MATLAB, resulting in combinations being quickly computed. In particular, we focused on the diatonic scale, interval of a major third, and the octatonic scale. Applications have been made to existing musical...
literature. We have found 15 examples of one type of note collection being used to evoke the structure of a different collection.

**An Application of Neural Networks to a Non-Deterministic Game of Imperfect Information**  
Nicholas Lydeen  
Faculty Mentor/Collaborator: Chris Ahrendt  
Poster #: 207

Neural networks have been successfully employed in the development of artificial intelligence agents designed to play deterministic games of perfect information. A relatively recent example is Google's AlphaGo, which plays Go on par with the world's most skilled players. AlphaGo was trained with a database of over 30 million board positions, drawing from 160,000 actual games. We investigated the application of neural networks to the game Lost Cities, a non-deterministic strategy game of imperfect information, without providing such "expert information" as known successful strategies or sample gameplay. We analyzed several training methodologies, comparing and contrasting the resulting agent's play against several metrics. These metrics include the agent's performance against an agent that plays randomly, an agent that selects its moves by Monte Carlo tree search, and other instances of the same agent. We also graphically analyzed the evolution of the neural network's weights as the agent played to gain insight into how the agent learns.

**Bayesian Inferential Statistic Implemented in R**  
Jack McQuestion  
Faculty Mentor/Collaborator: Christopher Davis  
Poster #: 237

Conventional frequentist statistics taught in undergraduate courses are obviously better than nothing, yet suffer from systematic failures that allow for easy p-hacking and consistent over-estimation of significance and effect sizes. Use of frequentist statistics is the strongest factor contributing to the replication crisis in the social sciences. Bayesian statistics, by contrast, have numerous advantages and can be tailored to any possible inferential problem. Many researchers and academics have advocated for Bayesianism, but only relatively recently have advances in computer technology allowed certain statistical methods to become practical. I wrote a script that allows one to carry out statistical inference using Bayesian statistics in R, An open-source programming language and software environment. The only assumption that the population parameters is an unknown, but fixed, Bernoulli distribution, though it can be generalized to categorical distributions and even multivariate numeric data. Methods are provided for constructing credibility intervals, establishing correlations, and comparing groups. Additional recommendations are given for data analysis and good scientific practice in general.

**The Colorability of Rational Tangles and Their Closures**  
Dawn Paukner, Molly Petersen, Jonah Amundsen  
Faculty Mentor/Collaborator: Carolyn Otto  
Poster #: 211

Our research team that consists Molly Petersen, Dawn Paukner, and Jonah Amundsen has been working on a research project called the Colorability of Rational Tangle and Their Closures. The colorability of a rational tangle is an invariant of the tangle; this invariant helps us distinguish between two tangles. We investigated the relationship between the colorability of the tangle and its rational number, which is a complete invariant of the tangle. We have proven the relationship between the tangles rational number and the tangles determinant; the tangles determinant is an indicator of the colorability. We also have
investigated the relationship between the colorability of the tangle and its closures using linear algebra. Our motivation for this project comes from enzymes used in DNA modifications.

**Investigating Association between BMI and Other Variables Using Skewed and Symmetric Skewed Regression Models**

**Kaolee Yang**

Faculty Mentor/Collaborator: *Mohammad Aziz*  
Poster #: 212

The purpose of this study is to model body mass index (BMI) for a given set of covariates by using skewed symmetric regression models. BMI serves as an important indicator of health and finding significant predictor of BMI drew researcher attention for decades due to the well-known fact that very high BMI leads to obesity. The distribution of BMI may be skewed, or bimodal in some studies while different age groups of individuals are considered. Due to the skew and bimodal nature of BMI data, we model BMI with skew-symmetric regression models for which error term assumes to follow skew-symmetric distribution. We also use traditional regression models for comparison. The models are fitted to UWEC BMI data, and a data obtained from the National Health and Nutrition Examination Survey (NHANES). The purpose is to identify potential variables that affect BMI. Our results indicate height and weight to be the most significant variables that affect BMI. Besides height and weight, some other variables that show significant relationship with BMI are age, alcohol, physical activity, sleep troubles, race, education, smoking etc.

**Involtutions and Orientation-Preserving Symmetries in the Hyperoctahedral Group**

**Rita Post, Jingtai Liu**

Faculty Mentor/Collaborator: *aBa Mbirika*  
Poster #: 209

We study a variety of involutions and orientation-preserving symmetries in the hyperoctahedral group, G(2,1,n). We examine the involutory elements and their corresponding conjugacy classes. We explore some combinatorial aspects of the analogue of the alternating subgroup A_n a subset of the symmetric group S_n in G(2,1,n)—namely, the orientation-preserving symmetries which we denote A(2,1,n). We present formulas for calculating the sizes of each involutory conjugacy class and for calculating the number of involutory conjugacy classes in the hyperoctahedral group for all n. We investigate the intersection of the elements of A(2,1,n) with the involutory elements for a given n in G(2,1,n) to determine the number of orientation-preserving symmetries of order 2 for a given n.

**Lunar Effects on University of Wisconsin - Eau Claire On-Campus Housing Incidents**

**Danielle Brushaber, Thao Tran**

Faculty Mentor/Collaborator: *Jessica Kraker*  
Poster #: 182

Empirical studies have hypothesized a lunar effect on human behavior, though scientific analyses have produced mixed results regarding associations between phases of the moon and criminal offenses. The purpose of this project is to examine patterns in incidents of student misconduct in UWEC residence halls across time, with particular investigation of possible lunar effects. On-campus housing incidents from August 2012 to December 2016 were analyzed using two statistical approaches: non-parametric tests and time-series analysis. Understanding the patterns of on-campus incidents over time (with the effect of the full moon and/or other recurring circumstances) will contribute meaningful insights for hall directors, resident assistants, and entities who support and protect students. This study is compared to existing literature discussing the lunar effect on human behavior.
**The Moduli Space of Non-Nilpotent Complex 2/3-Dimensional Associative Algebras**
Christopher Magyar, Lucas Buchanan, Alice Ching, Haotian Wu, Grant Keane
Faculty Mentor/Collaborator: Michael Penkava
Poster #: 180

We have been studying moduli spaces of complex associative algebras on various $Z_2$-graded vector spaces. A moduli space of algebras consists of equivalence classes of isomorphic algebras, and a $Z_2$-graded space has a decomposition into a direct sum of two subspaces, one called the even elements and the other the odd ones. There are 313 algebras in the space, of which 18 are families depending on a projective parameter. We have also studied how the algebras deform, and have classified them according to their deformation theory.

**RNA Secondary Structure and C&C Matchings**
Nicole Anderson, Mckenzie Scanlan
Faculty Mentor/Collaborator: Amanda Riehl
Poster #: 213

RNA forms bonds with itself and partially determines how the RNA functions. We investigate some models for this RNA secondary structure using a mathematical object called a matching. Since these secondary structure bonds happen in 3-dimensional space, some bonds are more likely than others based on how close two molecules are and which bonds are thermodynamically minimal. A number of different models have been created to approximate which matchings are likely to show up in RNA and which aren't. One family of models, called the largest hairpin family, allows unlimited stem-loops but restricts the number of pseudoknots in the RNA secondary structure. We investigated a largest hairpin model called C&C using graph theoretic tools and combinatorial analysis. By analyzing C&C matchings combined with earlier work on L&P matchings, we have revealed traits common in all largest hairpin matchings.

**A Statistical Analysis of the Effect of R on Student Learning in Probability**
Nicolas Larson
Faculty Mentor/Collaborator: Abra Brisbin
Poster #: 214

How can we help students learn math? One way is introducing technology into the classroom to help students better understand what they are learning. We tested the effect of a statistical computing program called R on students’ performance and confidence. We gathered data from 11 pairs of homework problems in a course on probability. One problem in each pair required the use of R. We used linear regression to test the effects of R on students’ confidence levels and on their scores, with and without effects of each homework assignment and of each student’s baseline performance. Results were inconclusive, suggesting a need for larger sample sizes. There was some indication that students grew more confident in their use of R as the semester progressed.
Mathematics and Art & Design

Integration of Mathematics and Visual Design
Casey Grosshauser, Alexander Graham
Faculty Mentors/Collaborators: Simei Tong, Li-Ying Bao  
Poster #: 210

This poster will present the joint work of mathematics and art design. The research team employed technology software into an artistic design. Mathematical concepts help make the artistic design more logical and interesting. The process of making quilts was definitely a rewarding experience. Overcoming the challenges was the best part of this research experience. Alexander Graham is majoring in Art & Design. He designed a 36in by 36in square with an overlapping pattern of squares that were all “Perfect Squares.” They tessellated into a pleasing manor to draw focus towards the center. The second quilt he designed was a three dimensional image of a group of flowing blocks with perspective and color. Casey A. Grosshauser is majoring in Actuarial Science. He designed a convergence pattern with three different colors in a Fibonacci sequence. The second quilt that he designed was based on the course Math 350, Financial Mathematics. There are four different graphs involving put and call options. Then using creative thinking skills he integrated these graphs into the quilt. The last quilt was collaboration work. The team designed a rotational, symmetrical, and convergent quilt using varying sizes of squares and circles with a pleasing blue and purple color palette.

Mathematical Symmetry in Visual Art Design
Roslyn Cashman, Austin Angell
Faculty Mentors/Collaborators: Simei Tong, Li-Ying Bao  
Poster #: 238

Our research project integrated aspects of the mathematical principle of symmetry, artistic imagination, and color theory to form three 3D quilts. Each student made an individual quilt prior to the final collaboration to become familiar with the techniques of sewing and creative designs. The designs were made using Adobe Illustrator to ensure perfect symmetry, accurate measurements and proper perspective. Roslyn Cashman created a quilt entitled Nested Cubes. Equilateral triangles were used to construct hexagons. Using color theory she selected and arranged fabrics to create the illusion of nested, 3D cubes. Austin Angell created a quilt entitled 3D Mobius Stars. Three pairs of 3D Mobius triangle and tetrahedron shapes were rotated 120 degrees to form a circular pattern. Using varying color schemes on each rotation creates the illusion of 3D lighting effects. The collaboration is entitled Frontier. The focal point consists of three overlapping four-point stars in primary colors of red, yellow, and blue. The variation of value and saturation form the illusion of three-dimensions. The background contains a green diamond underneath a blue circle symbolizing the never ending process of discovery on an unknown frontier.

Mathematics and Biology

Can Computers Weave a More Perfect Web?
Taren Leitzke, Kayla Billman, Sarah Reukema
Faculty Mentors/Collaborators: Christopher Davis, Carolyn Otto, Todd Wellnitz  
Poster #: 151

Our research goal was to design a rule-based computer model using genetic algorithms to create spider webs matching those found in nature. We chose to recreate the classic, 2-dimentional orb web, which is
typical of Araneus spiders commonly found in Wisconsin. Using Java programming language, we recreated a model described by Krink and Vollrath (1997), and then improved upon it by developing increasingly sophisticated simulations that incorporated web-building costs and prey-capture benefits. Different versions of the simulation program were created so that each version “wove” its webs following different rules. To provide data for comparison, a complimentary field project collected and measured actual spider webs. Having run over 150 web-building simulations, our next step is to look for discrepancies between the real life and model data. This will help us assess whether the web-building rules used by our models effectively mimicked spider webs found in nature. By enhancing our understanding of how real spider webs are built, our work might have value for creating artificial web structures for use in filter and fabric design, architectural forms, and other applications.

### Natural and Physical Sciences

#### Biology

*Arabidopsis thaliana* **Plants with Mutations in the LRB1 and 2 Genes Show Reduced Germination Inhibition by Salt**

**Quinn Steiner**

Faculty Mentors/Collaborators: *Derek Gingerich, Tali Lee*  
Poster #: 90

We have found that two genes in the model flowering plant *Arabidopsis thaliana*, Light-Response BTB 1 (LRB1) and 2 (LRB2), act as prominent negative regulators of the red light-response pathway in plants. They do so by regulating the levels of the phytochrome (phy) red/far-red photoreceptors. It is possible; however, that LRB1 and 2 also have additional roles in plant growth and development. In order to see if this is the case, last spring students in Dr. Tali Lee’s Biol 318 Plant Form and Function course conducted screens with lrb1 lrb2 mutants to see if the plants were altered in their responses to other environmental cues. It was discovered that the lrb1 lrb2 mutants are resistant to germination inhibition by the salt NaCl. Work in the Gingerich lab since has focused on confirming this effect as well as determining if it is simply the byproduct of the over-activation of the red-light pathway or if the LRB genes have roles in the germination process independent of their roles in red light signaling. To help answer this question, we have been conducting germination assays with lrb and phy mutants, on varying levels of NaCl. Data from these assays will be presented.

**Caught Again? Do Recapture Rates of Banded American Goldfinches Differ between the Sexes?**

**Jenna Barlow, Charity Harris, Terrance Shaurette**

Faculty Mentor/Collaborator: *Paula Kleintjes Neff*  
Poster #: 60

American Goldfinches are a year round Wisconsin resident. They are the most frequently captured and banded songbird at Beaver Creek Reserve (BCR), Fall Creek, WI. We analyzed bird banding data collected (2007-2016) by mist-net captures pooled from four locations at BCR. We are examining whether recapture rates differ between the sexes. Initial results suggest that males are caught twice as frequently as females, although they are recaptured at similar proportional rates over time. We are also examining whether recapture rates vary seasonally or yearly.
Caught and Banded: An Analysis of Recapture Frequencies of the Black-Capped Chickadee
Brandon Polzin, Mark Sutton, Rosey Jarvis, Michael Mauthe
Faculty Mentor/Collaborator: Paula Kleintjes Neff
Poster #: 59

Black-capped chickadees (BCCH) are year-round resident songbirds in North America and are commonly found at bird feeders. They are known for being comfortable around people and for their developed spatial memory. These factors may play an important role in the amount of times a BCCH is captured in a mist net and handled by humans. This research project utilizes bird banding data collected by Beaver Creek Nature Reserve (2007-2016), Fall Creek, WI, to answer the following questions: “Does the frequency of recapture change with each successive capture?” and “Does the time interval between successive captures change?” We expect to see a decreasing frequency of captures with each successive capture along with an increasing time interval between each capture, supporting the possibility that the BCCH learns from previous encounters. Our research will expand knowledge on the capacity of the BCCH to retain information about mist net locations and human handling.

Characterization of the BTB E3 Ubiquitin-Ligase Gene Families in Viridiplantae
Zachary Jacobson
Faculty Mentor/Collaborator: Derek Gingerich
Poster #: 91

Ubiquitylation, the attachment of ubiquitin to proteins marking them for degradation by proteasomes, is crucial for proper organism function. One family of complexes used are the BTB/Cullin 3/RBX E3 ubiquitin-protein ligases, which attach ubiquitin to target proteins. The BTB (Bric-a-Brac, Tramtrack, Broad Complex) proteins are the target-adapters that bind the proteins being ubiquitylated. The BTB gene families encode proteins within a wide range of eukaryotic organisms, and show great variability. We are interested when the particular BTB family composition seen in the higher plants may have arisen in evolution. To help answer this question we are identifying the complete BTB families in members of the Viridiplantae clade (land plants and their ancestors, the algae). Our analyses have shown while the size of the BTB families in land plant genomes vary significantly they all encode a similar set of BTB types. Interestingly, the algal genomes analyzed encode a distinctly different set of BTB types, with the possible exception of the charophyte Klebsormidium flaccidum. Charophytes are identified closely to the immediate ancestors of land plants, comparison of the Klebsormidium BTB family to other plant and algal BTB families may reveal changes of BTB types that may have occurred as plants colonized land.

Does Animal Scat Cause Earthworms to Aggregate?
Benjamin Schupp, Ashley Bell, Kali Draeger, Lauralynn Anderson, Madison Valek, Sarah Ward
Faculty Mentor/Collaborator: Todd Wellnitz
Poster #: 122

We hypothesized that fecal deposits represent an attractive food source for earthworms in nature, and consequently, worms would aggregate near animal scat. Earthworms consume primarily plant-derived organic matter, so we predicted that feces from deer and horses would be more attractive to earthworms than that from dogs. To test this, we conducted an experiment in a UWEC campus forest in which four scat treatments – deer, horse, dog, and feces-free controls -- were replicated across six plots. Each plot contained four subplots in which feces treatments were randomly assigned. Feces were added to and mixed in the soil for each treatment. Controls were disturbed in a similar manner. After 4-weeks, earthworms were extracted from subplots using mustard water, and then counted and identified in the lab. The data supported our hypothesis. Worm numbers showed deer > dog > controls, while the horse scat
treatment differed from neither deer nor dog. Earthworm richness exhibited a different pattern. Control and deer feces treatments averaged 1 species less than did the dog and horse treatments. These results suggest that animal fecal deposits influence the distribution of earthworms on the forest floor, with implications for fecal decomposition rates and localized nutrient recycling.

**Does Leaf Type and Shredder Identity Determine Leaf Breakdown Rates?**

Sarah Ward, Lauralynn Anderson, Madison Valek, Benjamin Schupp, Ashley Bell, Kali Draeger  
Faculty Mentor/Collaborator: Todd Wellnitz  
Poster #: 120

Leaves are a critical source of carbon and energy for stream organisms belonging to the “shredder” functional feeding guild. Two common macroinvertebrates shredders found in Wisconsin streams are amphipods and isopods. We conducted an experiment in which these two shredders were fed leaves from either elm, maple or oak trees. Our hypothesis was that leaf breakdown rates would differ among tree species because their palatability to shredders would vary. Amphipods and isopods were collected locally, placed into plastic cups containing stream water, and given cut leaf disks from one of the three species (9 treatments, including shredder-free controls, n=6). After 1 week, leaf remnants were collected, dried and weighed. The data supported our hypothesis. Across treatments, leaf breakdown rates did not differ among tree species, but shredders differed in their leaf consumption such that amphipods > isopods > controls. On a per-individual basis, amphipods consumed greater amounts of the oak and maple leaves, whereas isopods consumed an equivalent amount of elm leaves. These results show that shredders were more important than tree species for determining leaf breakdown rates. However, they also suggest that interactions between shredders and leaf type may be important for determining detrital processing rates in streams.

**Do Leaves from Native and Non-Native Trees Decompose at Different Rates in Streams?**

Sierra Kleist  
Faculty Mentor/Collaborator: Todd Wellnitz  
Poster #: 121

Little Niagara Creek commonly receives leaves from native and non-native trees. Decaying leaves are an important source of food and habitat for microorganisms and macroinvertebrates, two groups that play a prominent role in leaf breakdown. Bacteria and fungi decompose leaves while macroinvertebrates break the leaves apart as they feed on these microscopic organisms. To study the relative importance of leaf type, shredders, and microbial decomposition, we examined leaves from three native (elm, oak and maple) and two non-native trees (gingko and buckthorn). Five nylon mesh bags were filled with 10 g of dried leaves from each species. These bags were replicated four times and submerged in Little Niagara Creek for three weeks. After retrieval, leaf remnants were removed, associated macroinvertebrates were picked out, counted, and identified, and the leaf remnants were dried and reweighed to calculate mass lost. Leaf sugar content was also measured to determine leaf nutritional value. The data showed that the leaves from non-native buckthorn had a higher sugar content and decomposed faster, probably as a result of microbial action. By contrast, macroinvertebrates preferred native oak leaves that were largely intact and had a lower sugar content, suggesting they utilized the leaves as habitat rather than food.
**Identification of Brain Regions Activated with Arousal-Induced Clock Resetting in Female Mice**  
*Cera Langton, Savannah Herman*  
Faculty Mentor/Collaborator: Daniel Janik  
Poster #: 2

Circadian rhythms, controlled by the suprachiasmatic nucleus (SCN) of the brain, are important in many biological functions such as controlling sleep and patterns of rest and activity. Desynchronization of circadian rhythms with the external environment can result in sleep disorders and major depression. We use mice as a model for studying how circadian rhythms are synchronized with environmental cues. Transitioning mice into complete darkness in the middle of the day causes a 2.5 hour advance of their circadian clock. In this project, we are attempting to identify brain regions activated when mice undergo this type of shift to their clock. After transitioning mice to complete darkness, we processed their brains to visualize Fos protein, a marker of neuronal activity. We quantified Fos staining in various regions and compared the brains of animals who had their clocks shifted with the brains of controls who did not have their clocks shifted.

**Sustainable Ecological Restoration in the Galápagos Islands**  
*Danielle Mares, Valerie Gehn*  
Faculty Mentor/Collaborator: Wilson Taylor  
Poster #: 29

The Galápagos Islands are a volcanic archipelago located 600 miles off the Ecuadorian coast, and are home to a unique set of ecosystems and endemic species. Historically, they’ve had a very low human population, but recently have experienced an increase in tourism and related urbanization. This has directly led to the increase of introduced species to the islands—the single largest threat to the unique biodiversity of the Galápagos. Endemic and native plant species and animal species that depend on them are experiencing rapid declines throughout the islands due to direct effects of these invasive species. The Galápagos Verde 2050 project aims to restore the islands to their native and endemic states through conservation management practices and implementation of sustainable growing technologies in both natural and agricultural settings. This involves the analysis of endemic plant populations, seed collection and sowing, implementation of Groasis growing technology, and data collection and analysis. This project is being conducted in three stages, with the first stage encompassing 4 islands completed in December of 2016. The information amassed from this first phase will help improve the efficiency and success of the second phase as the project turns its attention to the next set of islands.

**International Research Fellowship with the Charles Darwin Research Station: Conservation and Management of Land Birds in the Galápagos Islands**  
*Mackenzie Flynn*  
Faculty Mentor/Collaborator: Wilson Taylor  
Poster #: 32

The Galápagos Islands are currently experiencing a massive population decline of several land bird species including the Galapagos Flycatcher and the Vermillion Flycatcher. One of the most imminent threats to these land birds is the presence of the invasive fly, *Philornis downsi*. The larvae of this parasite feed on the blood of recently hatched chicks and this leads to high levels of fledgling mortality. During the summer of 2016, analysis of videos taken from nest cameras was completed using BORIS computer software. These data were then sent to collaborators at the University of Minnesota for further pattern analysis and use in developing biological control methods for *P. downsi*.
Invasive Earthworm Distributions on Islands in the BWCA - Do Fires and Campsites Matter?
Jenna Barlow, Cory Dick, Brian Johnson, Terrance Shaurette, Troy Wesley, Wil Raasch
Faculty Mentor/Collaborator: Todd Wellnitz  Poster #: 63

This distribution and extent of invasive earthworms in the forest ecosystems of Minnesota’s Boundary Waters Canoe Area Wilderness (BWCA) is poorly known. Believed to have been introduced by anglers, invasive earthworms can alter the physical and chemical properties of soil and modify forest plant composition. To examine factors influencing invasive earthworm distribution and abundance, we sampled 38 islands across five connected lakes to assess the effects of campsites, forest fires, and biogeographic factors. Campsites represent point sources of invasion; fire disturbance is important for shaping the BWCA ecosystem; biogeographic factors (i.e., island size, distance from shore, and distance from entry point) have unknown potential for influencing worm abundance. We sampled three sites on each island. A structural equation model (SEM) showed that campsite presence had a strong, direct effect on earthworm numbers, whereas fire had indirect effects through its influence on soil organic matter and plant cover. In contrast, island biogeographic factors had negligible influence. Our data support the hypothesis that campsites serve as invasion points and fire limits earthworm populations by depleting soil organic matter and promoting understory plant growth. Future work will examine earthworm distribution and abundance in relation to burn history and distance away from campsites.

Nutrient and Light Limitation Effects on Algal Populations in Two Streams
Anna Scheunemann, Danielle Mares
Faculty Mentor/Collaborator: Todd Wellnitz  Poster #: 89

We examined how N and P, limiting nutrients commonly found in agricultural and urban runoff, affected stream algal populations in relation to light availability. Algal blooms are associated with high nutrient concentrations and can pose problems for freshwater ecosystems, the organisms they contain, and humans that benefit from them. We studied Little Niagara Creek and Lowes Creek, two streams draining urban and rural catchments, respectively. Two floats were constructed to hold vials filled with solutions containing either N, P, N+P or water (controls). Nutrient treatments were divided between open and shaded sections of the floats, which were left in the streams for two weeks. Algal biomass was then quantified as chlorophyll-a with a fluorimeter. Our results showed that light significantly affected algal biomass while nutrients did not. This outcome may have been due to the time of year the study was done (October and November). In late fall days are shorter and light levels are lower, and this may have made light the more important limiting factor. Alternatively, our nutrient-diffusing vials may have malfunctioned and failed to make nutrients accessible to algae. Further testing with different nutrient-diffusing substrates will be done this spring.

Patterns of Functional Diversity in Stream-Dwelling Fishes
Mackenzie Turner
Faculty Mentor/Collaborator: David Lonzarich  Poster #: 30

Within the discipline of stream fish ecology there has been a long and productive history of research that has explored questions concerning the origin and maintenance of diversity in stream ecosystems. Recent work in community ecology has promoted the value of a trait-based perspective to the study of fishes and fish assemblages, and coupled with new tools in statistical analysis, there exist opportunities for ecologists to revisit historical data sets for the purpose of generating increased understanding of these
ecological systems. In this study, we have undertaken an effort to measure a suite of 20 functional swimming and feeding traits from an archived collection of 15 common fishes from mountain streams of central Arkansas and to use these trait data in a re-examination of three extensive data sets - one on fish colonization, one on extinction/colonization dynamics and a third on fish-habitat associations. Our goal is to determine if an application of a trait-based approach to these data sets will provide new insights into our understanding of the factors contributing the dynamics and organization of fish assemblages in stream environments.

**Prevalence of Staphylococcus succinus and Staphylococcus equorum in Nasal Swab Isolates**

Mackenzie Flynn, Evan Moore, Lydia Shields
Faculty Mentor/Collaborator: Daniel Herman

*Staphylococcus equorum* and *Staphylococcus succinus* are bacterial species commonly associated with livestock and certain food products. Human infection as a result of these species is rarely reported and there are currently no reports citing these species as components of the normal human flora. During the summer of 2010, nasal swabs were taken from volunteers at various hospitals and communities in Ecuador. Bacteria isolated from these samples were initially characterized using cultural methods. Isolates that were mannitol fermenters and oxacillin sensitive were further characterized using multi-plex PCR and XapI restriction fragment length polymorphisms of the dnaJ gene. Approximately 17% of samples analyzed thus far contain either *S. succinus* or *S. equorum*. These preliminary data suggest that these species can at least be transient members of the human nasal flora and can possibly be established as a more stable component.

**Progress towards Identifying lrb1 lrb2 Enhancer Mutations in the Plant Arabidopsis thaliana by Next-Generation Genome Sequencing and Mapping**

Allison Welter
Faculty Mentor/Collaborator: Derek Gingerich

In the flowering plant *Arabidopsis thaliana*, the genes LRB1 and LRB2 (Light-Response BTB 1 and 2) encode proteins that function as target adaptors in BTB/Cullin 3 E3 ubiquitin-ligase complexes. These complexes target the red light receptor phytochromes to be degraded and plants containing mutations of both LRB1 and 2 are hypersensitive to red light. We used the lrb1 lrb2 mutants as the basis for a genetic screen to identify additional genes involved in light responses. lrb1 lrb2 plants were mutagenized with ethyl methanesulfonate (EMS), which typically introduces single-nucleotide changes, and we screened individuals for those that had increased sensitivity to red light compared to the lrb1 lrb2 parents. These screens identified a collection of enhancer mutations. Our current focus is to map and identify the EMS-induced mutations in these lines using a whole-genome sequencing and next-generation sequencing strategy. This approach involves crossing the enhancer mutants back to the lrb1 lrb2 parents, and then sequencing genomic DNA isolated from pools of F3 generation individuals that are homozygous for the enhancer mutations. As we analyzed the F1 and F2 generations we discovered that these mutations are genetically dominant. We are currently isolating F3 DNA and will be sending it for sequencing soon.
Scaling of Plant Functional Diversity across Stress Gradients
Lindsay Backhaus, Chelsie Bee, Kayla Budd, Briana Edwards, Zachary Eicher, Brooke Feddick, Charity Harris, Skylar Huite, Michael Mauthe, Alexandra Sueldo
Faculty Mentor/Collaborator: Evan Weiher
Poster #: 149

Scale has an incredible ability to influence biological patterns such as biodiversity and processes such as community assembly. Community assembly addresses how the environment filters and sorts species by their traits. Our goal was to better understand how scale-dependence influences plant functional diversity within and across habitats. We sampled plant traits in six vegetation types varying in soil moisture and light. Sample plots were nested with areas ranging from 12.5 by 12.5 cm to 8 by 8 m. We measured four functional traits encompassing size and leaf economics (speed of growth). We determined how functional trait diversity increased with area using a Monte Carlo simulation to assess differences from randomness. Functional diversity increased curvilinearly with area, with the dry plots having the most functional diversity compared to the other plots. In the two extremes of dry and wet, less light led to underdispersion and more light led to overdispersion at small scales. Overall, most of the sites had lower functional diversity than expected by chance at medium scales. This suggests trait expression may be strongly tracking fine-scale environmental variation.

Stress Increases Holeyness of Trait-Space Occupation in Plant Communities
Skylar Huite, Lindsay Backhaus, Chelsie Bee, Kayla Budd, Briana Edwards, Zachary Eicher, Brooke Feddick, Charity Harris, Michael Mauthe, Alexandra Sueldo
Faculty Mentor/Collaborator: Evan Weiher
Poster #: 150

Functional trait diversity (FD) is an important yet understudied aspect of biodiversity even though it can provide insights for understanding how local assemblages are delimited from regional species pools. The functional diversity of a community can be measured as the range of trait values (i.e., maximum – minimum) for a single trait. For two traits, the FD can be measured as the area occupied by the community using a convex hull. This means species inside the hull do not really contribute to this measure of diversity. For example, does removing the midfielders from a soccer team have no effect on the diversity of players? Blonder (2014) proposed that holes within hulls are missing species combinations and are important to quantify. We sampled plant traits in 8 by 8 m plots in six vegetation types varying in soil water content and light. We measured four functional traits encompassing size and leaf economics (speed of growth). We used Blonder’s hypervolume package in R to calculate "holeyness." We found that sites with higher stress (dry and wet sites) had more missing trait combinations within the convex hull. This suggests there may be divergent ecological selection in stressful habitats.

Up from the Tropics: Do Migratory Male Rose-Breasted Grosbeaks Arrive Earlier and Weigh Less than Females?
Hannah Morton, Sarah Ward, Ashley Bell
Faculty Mentor/Collaborator: Paula Kleintjes Neff
Poster #: 61

The Rose-breasted Grosbeak (RBGR) is a neotropical migratory songbird that breeds in North America. We hypothesize that male RBGR will arrive earlier than females in spring to establish territories on their breeding grounds. Given potential differences in arrival dates, we were also curious to look at weight differences between males and females. We analyzed 9 years (2008-2016) of bird-banding data for the RBGR collected by the Beaver Creek Reserve Citizen Science Center, Fall Creek, WI. Data were from...
songbird mist-net captures. Results from our initial data sorting and analyses suggest that more males than females comprised the first date of spring arrival and it typically occurred in early-mid May. Males also had an average smaller body mass (gm) than banded females. We suspect that females weigh more than males in the spring due to their preparation of the breeding and nesting season.

**Which Physicochemical Factors Predict Crayfish Abundance in Wisconsin Streams?**

**Nathan Sylte, Evan Ziperski**  
**Faculty Mentor/Collaborator: Todd Wellnitz**  
**Poster #: 119**

We sampled 11 streams in northwest Wisconsin to assess the importance of chemical and physical factors for determining crayfish presence and abundance. We hypothesized that stream calcium levels (chemical factor) would need to exceed 2.5 ppm for crayfish to be present because calcium is necessary for exoskeleton hardening following molting. We also hypothesized that substrate size (physical factor) would correlate with crayfish abundance because larger substrates provide better habitat and shelter. Other factors measured included pH, conductivity, turbidity, and stream flow, depth and width. Crayfish were found in seven of the streams sampled. Invasive rusty crayfish (*Orconectes rusticus*) were extremely abundant in two streams, and native species of virile (*O. virilis*) and northern clearwater (*O. propinquus*) crayfish were found in five other streams. Factor effects on crayfish density were examined using multiple regression and principle components analysis. We found that while crayfish numbers had a strong positive relationship to substrate size, calcium levels had negligible influence. Steam flow and width also showed positive relationships to crayfish density, but no measured parameter effectively predicted whether or not crayfish would be present in a stream. Our data suggest that physical factors better predicted crayfish densities in streams than did chemical factors.

**Winter Weight Gain or Breeding Activity Weight Loss: How Does Dark-Eyed Junco Weight Seasonally Differ?**

**Hannah Wirth, Morgan Wilde, Thomas Gustafson**  
**Faculty Mentor/Collaborator: Paula Kleintjes Neff**  
**Poster #: 62**

Dark-eyed Juncos (slate-colored subspecies) are boreal migrants that overwinter in regions of the Midwest, including Wisconsin. In the spring, birds migrate to more northern breeding grounds. The purpose of our research is to determine whether there is a significant weight difference between pre-breeding (March-May) and post-breeding (September-November) Juncos banded at Beaver Creek Reserve (BCR), Fall Creek, WI. We used data collected from the BCR Bird Banding Program (2008-2016). Our initial analyses indicate that average weight is greater in the pre-breeding season (19.88-22.23g) than the post-breeding season (18.36-20.15g). Only in 2013 did weight significantly differ. Weight gain in the spring may be due to preparation for the breeding season as well as from access to bird feeders or variability in regional weather.

**Zebrafish, C. elegans and Human Polycystic Kidney Disease: Identifying Potential Disease Biomarkers through Comparative Analysis**

**Samantha Meyer**  
**Faculty Mentor/Collaborator: Jamie Lyman Gingerich**  
**Poster #: 93**

The focus of this project is to identify the downstream effects of mutations in the causative genes of polycystic kidney disease. Currently there is no cure for the disease, but this research could aid in the understanding of symptom progression and early identification of the disease. This project brought
together two large genetic datasets, one from *C. elegans* and the other from zebrafish, to identify genes potentially involved in human disease progression. We mined, refined, and compared the datasets, asking different questions each time to compile a diverse set of information on the genes in question. In conjunction with these analyses, zebrafish orthologs of *C. elegans* genes which affect the localization of the PKD-2 protein were identified. Throughout all of these analyses careful note was taken of genes with functions pertaining to the kidneys or cilia. At the end of this phase of the project, a list of possible genes linked to symptom progression will be compiled. The next step is to investigate these genes through manipulation of the genes themselves in the model organisms: we will ask when and where these genes are expressed to develop a clearer understanding of their true function and relationship to polycystic kidney disease.

**Biology and Mathematics**

*Web Structure of the Orb-Weaving Spider, Araneus*

Taren Leitzke, Kayla Billman, Sarah Reukema  
Faculty Mentors/Collaborators: Todd Wellnitz, Christopher Davis, Carolyn Otto  
Poster #: 152

The goal of this project was to gather data on Araneus spider webs to help improve web building computer simulations for our associated project, “Can Computers Weave a More Perfect Web?”. Araneus webs of different sizes were located around the UWEC campus, lightly sprayed with paint, and then collected by gently pressing them against pieces of cardboard sprayed with glue. The mounted webs were scanned, converted to pdf files, printed off, and then measured. Data were collected on web frame size, spacing between web stands, the number of prey caught and several other metrics. Our results confirmed that larger webs caught more prey, but the overall differences in structural design did not appear to change as webs size increased. Additional analyses will be performed to determine how web structural features scale with size, and comparisons will be made to computer-generated webs to assess their similarity to actual webs.

**Chemistry**

*Atmospheric Measurements Using an Unmanned Aerial System (UAS): Five Hole Probe as a Wind Profiler*

Jason Rosas Ramirez, Jacob Johnson  
Faculty Mentor/Collaborator: Patricia Cleary  
Poster #: 148

The overall goal of this project is to add sensors to an unmanned aerial vehicle to measure atmospheric composition and properties. One such sensor is a 5-hole probe, capable of determining a 3-dimensional air velocity as the vehicle flies through it. Ultimately this device will be used to profile wind vectors at the Lake Michigan shoreline. These vectors, along with other readings, will help us understand gradients in ozone mixing ratio in the atmosphere near to the lake. This research focuses on the engineering and testing of a 5-hole probe. Once calibrated, the probe will be mounted on a UAS with capabilities to stream the data live to our computers.
**Atmospheric Measurements Using an Unmanned Aerial System (UAS): Onboard Sensor Development and Integration**  
Kyle Geib, Mario Sanchez, Alexander Stout  
Faculty Mentor/Collaborator: Patricia Cleary  
Poster #: 154

With technological advances in unmanned vehicles ramping up, research that used to cost a fortune is becoming relatively cheap and less time consuming. This project is aimed toward incorporating atmospheric sensors into a UAS as a viable and inexpensive method for monitoring atmospheric properties and composition. The sensors will log temperature, humidity, air velocity, and ozone to better understand the mesoscale meteorological phenomenon of the lake breeze front. Currently we are in the stage of integrating the sensors with an on-board Raspberry Pi microcontroller into a Pixhawk flight controller for live-feed data, along with 3D printing housings for the onboard electrical components and sensor mounting hardware.

**A Biographical Compendium of Organic Name Reactions**  
Rachael Dieringer  
Faculty Mentor/Collaborator: David Lewis  
Poster #: 20

Name reactions are a mainstay of organic chemistry, and serve as a useful short-hand in discussions among organic chemists. These discussions almost always focus on the reaction itself, and seldom include any significant consideration of the chemist(s) who discovered or developed the reactions. We have begun the development of a biographical compilation of organic reactions, where the chemists are an important focus of the work. We will report on the progress to date, including the discussion of the Michael addition reaction.

**Characterization of Ambient Particulate Matter Sampled at an Active Sand Mine Facility in Northwest Wisconsin**  
Callie Fischer, Rachel Mooney, Julie Zhang  
Faculty Mentor/Collaborator: Patricia Cleary  
Poster #: 153

Concern has arisen about silica levels in ambient particles near frac sand mines in Northwestern Wisconsin. Airborne particles from mining and processing activity may release respirable silica into the air, which in large quantities, can have adverse health effects on the local population and the workers. To assess these levels of silica, we adopted an X-ray diffraction (XRD) and scanning electron microscopy/energy-dispersive X-ray spectroscopy (SEM-EDS) analysis to test real air samples. Calibrations were constructed for the XRD analysis (following NIOSH Method 7500) with silica standards containing 10μg - 500μg respirable silica on filter media with detection limits of 10-44 μg. SEM-EDS methods incorporated identifying geologic composition of particles using elemental analysis as compared to crushed rock samples representative of the sandstone formation from which the mining occurred, such as clay, hematite and silica. Real air samples were collected at a frac sand site using a personal cascade impactor. Filter substrates were pre-weighed and post-weighed to determine the total dry mass of particles sampled and preliminary XRD results show as much as 10% of the mass can be attributed to crystalline silica in the samples. Problems, interferences, comparison with the SEM results, and evaluation of filter types will be discussed.
**Chiral Auxiliaries Based on Camphor**  
Michael Kennedy, Andrew Dahl  
Faculty Mentor/Collaborator: David Lewis  
Poster #: 146

Chiral auxiliaries based on camphor have been used for at least three decades, especially for Diels-Alder reactions (e.g., Oppolzer's camphorsultam), and there are now a wide range of these derivatives that have been used. Interestingly, the 3-endo-benzylisobornyl system has been relatively little used as either a chiral auxiliary or a chiral organocatalyst. We will report the outcomes of several reactions where the benzylisobornyl derivative functions as a chiral electrophile, and we will report on progress towards chiral organocatalysts based on this structural motif.

**Computational Docking of Uric Acid and Allopurinol Derivatives that Can Bind to Xanthine Oxidase**  
Lysengkeng Her  
Faculty Mentor/Collaborator: Thao Yang  
Poster #: 116

Xanthine Oxidase (XOD) is an enzyme that catalyzes the oxidation of hypoxanthine to xanthine, then to Uric Acid, the final waste product of purine. When the activity of XOD is accelerated the level of uric acid in a person’s blood is increased and high level of it can lead to a buildup of urate crystals in a person’s joints, leading to the cause of gout disease. The goal of this project is to use computer to design allopurinol and urate derivatives that will bind to XOD. The program Autodock Vina is used to perform dockings to determine whether these compounds can bind to XOD. We either replaced or added different functional groups such as fluorine or carboxylic acids on the six-membered and five membered rings of urate and allopurinol. The structures of docked ligands were then compared to those of the original urate and allopurinol to determine if they have similar interactions, RMSD values, affinity and positions. Our results showed that urate with carboxylic acid at C#8 and allopurinol with fluorine at C#2 and C#6 could be potential inhibitors because they have higher affinity.

**An Exploration of Alpha-Cyanocinnamate Esters as a Replacement for DEAD in the Mitsunobu Reaction**  
Trey Olson  
Faculty Mentor/Collaborator: David Lewis  
Poster #: 155

The Mitsunobu reaction is a reaction that permits the replacement of an alcohol hydroxyl group by a nucleophile, with inversion of configuration at the alcohol center. The reaction requires triphenylphosphine and diethyl azodicarboxylate, whose acronym, DEAD, is curiously appropriate: it is highly toxic, and is explosive when pure. We are exploring the possibility of converting alcohols directly to nitriles without the need for DEAD, or the need for cyanide, by using alpha-cyanocinnamate esters as a replacement for both these toxic reagents. Our progress to date will be presented.

**Fine-Tuning the Activity of Escherichia coli Prolyl-tRNA Synthetase through Alternation in the Flexibility of a Distant Non-Catalytic Loop**  
An Hodac  
Faculty Mentor/Collaborator: Sanchita Hati  
Poster #: 184

Aminoacyl-tRNA synthetases (AARSs) are enzymes that catalyze the covalent attachment of amino acids to their cognate transfer-RNA (tRNA). This reaction is known as the aminoacylation of tRNA and is crucial for protein synthesis in all living organisms. These essential enzymes are large proteins, comprised of multiple domains. It is yet to be fully understood why these enzymes are considerably large, when only
a small number of residues of an AARS are directly involved in catalysis. An important finding has been made in our research group that coupled dynamics between different structural elements of these enzymes are responsible for facilitating enzymatic rate enhancement. We are currently exploring if the activity of an enzyme could be modulated by changing the dynamics of a distant structural element. In particular, we are studying the impact of a highly flexible loop, which is distantly located within the editing domain of *Escherichia coli* prolyl-tRNA synthetase (Ec ProRS; residues 258 to 268), on the catalytic function. We have generated several single-point mutants to increase or decrease the flexibility of this highly flexible loop, and examine the impact of those mutations on the catalytic efficiency of Ec ProRS. In particular, a non-radioactive malachite green assay is being used to determine the kinetic parameters of wild-type and mutant ProRSs. We will present the preliminary data of our kinetic study.

**Integrating Atmospheric Sensors into Unmanned Aerial Systems: Integrating data Streams**

Aaron Nelson, Alexander Stout  
Faculty Mentor/Collaborator: Patricia Cleary

Analyzing atmospheric conditions in situ using manned airplanes has historically been effective yet expensive and limiting. With the growing usage of UAS, this project is aimed at incorporating atmospheric sensors into a UAS as a viable, inexpensive and responsive method for atmospheric monitoring. Our group’s goal is to record serial data from a compact ozone monitor connected to a Raspberry Pi.

**Investigating Catalytically Important Residues in Escherichia coli Prolyl-tRNA Synthetase through Site-Directed Mutagenesis.**  
Murphi Weinzetl, Louis Losbanos, Huakun Hu, Lauren Adams  
Faculty Mentor/Collaborator: Sanchita Hati

Prolyl-tRNA synthetase (ProRS) is a modular enzyme, which is responsible for catalyzing the covalent attachment of the amino acid proline to its cognate tRNA. This reaction is essential for protein biosynthesis in all living organisms. It has been established that the chemical properties of amino acid residues in the protein structure influence its catalytic function. In the present study, we have employed site-directed mutagenesis to probe the role of four residues in *E. coli* ProRS (Ec ProRS) on the overall catalytic function. Specifically, we examined the impact of changes in amino acid properties on the interactions between the enzyme (Ec ProRS) and the substrates, proline and ATP. The results of our study can be used to experimentally validate the findings of a quantum mechanical/molecular mechanical simulation of the prolyl adenylate formation, and has potential applications towards the design of a drug that selectively inhibits Ec ProRS. The preliminary results of our study will be presented.

**Monitoring Organelle-Specific Responses to Amphotericin B in Mammalian Cells and Candida albicans Biofilms**

Claudia Tourville  
Faculty Mentor/Collaborator: Scott Bailey-Hartsel

*Candida albicans* is the most common fungus to cause infection in clinical settings. The species is unique in its ability to form a highly resistant biofilm that is difficult to eradicate from the body with antifungal drugs. Confocal laser microscopy using organelle-specific fluorescent probes provides an internal view of *Candida albicans* along the stages of development and drug response. We have developed a series of our own naphthalimide-based fluorescent probes targeted to mitochondria, lysosomes, and the Golgi
apparatus to monitor organelle vitality in real time. Using our probes, we have investigated the various formulations of the antifungal drug Amphotericin B (AmB) and its effect on specific organelles in both model human cells and Candida albicans yeast and hyphal cells in vitro. Thus far, we have found that Fungizone, the micellar formulation of AmB, leads to depolarization of mitochondria in some human cell lines while having little effect on mitochondria in Candida albicans biofilms. Comparable doses of Abelcet and Ambisome, liposomal formulations of AmB, have less of an impact on mitochondrial integrity in human cells. This intracellular perspective of cell health will open doors for the optimization of antifungal drugs through pinpointing their effective mechanisms against fungi while minimizing cellular casualties.

**A Novel and Robust Series of Organelle Fluorescent Probes**

Gabrielle Rigden, Claudia Tourville  
Faculty Mentor/Collaborator: Scott Bailey-Hartsel  
Poster #: 176

We have developed and tested a series of organelle-specific fluorescent probes based on the aminonaphthalimide fluorophore. The three probes presented here redistribute according to transmembrane voltage, pH or high cholesterol lipid domains. We have successfully used them to image mitochondria, lysosome/acidic endosomes and Golgi apparatus in multiple live mammalian cell lines as well as fungi including Candida biofilms by confocal microscopy. Compared to some of the most popular commercial probes, our probes possess several advantages: 1) they utilize the increasingly available but little used 405 nm laser for excitation yet due to a large Stokes shift can be visualized with green filter sets, 2) they equilibrate rapidly (seconds to minutes) with target organelles and respond rapidly to changing conditions such as mitochondrial depolarization, 3) they are extremely chemically stable and photostable allowing long-term monitoring of live cell organelles and 3D confocal imaging as well as having a long shelf life, 4) they have low toxicity toward mammalian and fungal cells and, 5) they have high quantum yields with little self quenching allowing for quantitative and qualitative imaging in complete culture media with minimal background noise. These probes have the potential to be very useful in long-term microscopic cell biology studies.

**Progress towards the Synthesis of Fluorescent Tröger's Bases with a Chiral Bridge**

Anna Giebink, Leah Martinez  
Faculty Mentor/Collaborator: David Lewis  
Poster #: 156

Tröger's base is a chiral V-shaped molecule formed by the condensation of two primary aromatic amines with formaldehyde under acid catalysis. The molecule possesses a C2 axis of symmetry, and thus also possesses a chiral endo cavity. These dibenzodiazocines are chiral molecules, but they racemize under acidic conditions: they lack configurational stability. Nevertheless, suitably substituted Tröger's bases have been used successfully in the formation of MOFs. In 2005, we published the first report of the synthesis of a Tröger's base (3) based on the highly fluorescent 4-amino-1,8-naphtahlimide nucleus, and investigated the effect of solvent on its fluorescence. By bridging of the dibenzodiazepine, we can lock the ring in a single enantiomeric form. To this end, we are working with bis-phenol derivatives (e.g., BPA and BINOL) in an effort to lock the ring in a single conformation, and thus provide a facile route to chiral cavitands that may have uses for chiral separations, etc. The fluorescent groups in the molecule will provide a simple method for monitoring complexation between the host and guest. Our progress to date will be reported.
Spectroscopic and Computational Studies of Organic Molecules in Electronic Excited States

Michael McDonnell
Faculty Mentor/Collaborator: Stephen Drucker
External Mentor/Collaborator: Ashley Mooneyham

Over the past decade, the computational chemistry community has made steady progress in developing methods for characterizing molecules in electronic excited states. We are contributing to this effort by obtaining benchmark experimental information on excited states. We are using cavity ringdown spectroscopy or resonant-enhanced photoionization spectroscopy to determine vibrational frequencies of the excited-state organic molecules. The experimentally determined frequencies provide a rigorous test of computed results. In the present work, we have determined frequencies for the lowest excited states of small molecules such as 2-cyclohexenone or gamma-pyrene. We report the experimental frequencies along with corresponding predictions from state-of-the art computational techniques.

Structural and Energetic Properties of H₃N-MX₃R Complex: Effect of the Halogen

Anna Ley, Muriel Metko, Robert Huber
Faculty Mentor/Collaborator: James Phillips

The general goal of this research is to explore the structural and energetic properties of molecular complexes, which refers to any association of two otherwise stable molecules. In this particular study, we are concerned with the effects of changing the halogen in complexes of the form: NH₃-MX₃-R (M= Si, Ge; X= Cl, F; R= C₆H₅, CH₃). Our interest in these complexes stems from the potential for applications in nanotechnology and in the design of piezoelectric materials. The properties of these systems were explored using quantum chemical computations; computer simulations of electron distribution and bonding. From these models, we determine equatorial structures, binding energies, and vibrational frequencies. Overall, with R=C₆H₅, the F-containing complexes have significantly stronger bonds than compounds with X=Cl. The binding energy for NH₃-SiF₃-C₆H₅ is 4.6 kcal/mol, while that for NH₃-SiCl₃-C₆H₅ is 3.1 kcal/mol. The binding energy for NH₃-GeF₃-C₆H₅ is 9.3 kcal/mol, while that for NH₃-GeCl₃-C₆H₅ is 4.4 kcal/mol. In addition, comparisons to the analogous R=CH₃ compounds will be made to determine if the same trends hold, and will be rationalized on the basis of how the halogen atoms impact the charge distribution and other key properties of methyl MX₃R compounds.

Structural and Energetic Properties of H₃N-MX₃-R Molecular Complexes: Exploring the Effects of the Metal (M) Atom

Benjamin Wahl, Mark Ostroot, Katelyn Weeks
Faculty Mentor/Collaborator: James Phillips

This project is concerned with structure and bonding in molecular complexes of the form H₃N–MX₃-R, where: M=Si, Ge; X=F, Cl; and R=CH₃ or C₆H₅. In general terms, a molecular complex is any association of two otherwise stable molecules. In this particular project, the goal is to survey these complexes and determine the effect of switching the metal center between Si and Ge. Broader interest in these systems stems from their potential to undergo major structural changes in different chemical environments (e.g., gas-phase vs. solid-state), and in turn, they may be useful for certain nanoscale, electro-mechanical applications. In this study, we used computer simulations of the electron distribution and bonding to predict equilibrium structures, bond energies, and vibrational frequencies. For each possible complex, there are multiple geometrical isomers, and prior to making direct comparisons, the first issue is identifying the most stable form (lowest energy) among these possible structures.
Specifically, for H$_3$N–GeF$_3$CH$_3$, the Ge-N bond energy is 8.0 kcal/mol, while for H$_3$N–SiF$_3$CH$_3$, value is only 4.6 kcal/mol. This illustrates that the Ge-containing systems exhibit stronger bonds. We will also explore analogous trends among the X=Cl and R=C$_6$H$_5$ systems, and identify the underlying physical factors that manifest such differences.

**Structural and Energetic Properties of Pyridine - HCl Complexes via Computations and IR Spectroscopy**

Camilla Soares  
Faculty Mentor/Collaborator: James Phillips  
Poster #: 118

We have been investigating the properties of the 1:1 H-bonded complexes of hydrogen chloride (HCl) with pyridine (C$_5$H$_5$N) and its fluorine-substituted analogs; e.g., fluoropyridine (C$_5$H$_4$FN), difluoropyridine (C$_5$H$_3$F$_2$N), trifluoropyridine (C$_5$H$_2$F$_3$N). We are seeking systems for which the H-bonding interaction and extent of proton-transfer are enhanced by inert, low-dielectric media (solid neon, argon, or nitrogen). The interactions in these complexes range from strong H-bonds to partial H+ transfer. We have used quantum-chemical models to obtain equilibrium gas-phase structures, frequencies, binding energies, charge distributions, and, in addition, we scan the potential energy along the H-bonding/proton transfer reaction coordinate. We observed that the addition of fluorine atoms to the pyridine ring systematically weakens the complex binding energy. However, the 2,6-difluoropyridine complex does not fall within the pattern along with the other substituted pyridines, it shows itself to be even weaker than the 3,4,5-trifluoropyridine complex. We are trying to determine if this effect is due to the position of the fluorine atoms on the pyridine ring, steric repulsion between the HCl and the forward-facing F’s, or both. We are also collecting infrared spectra in solid neon at 6K for fluoropyridine-HCl complexes, and these recent results will further validate the conclusions implied by the computational data.

**Structural Properties of H$_3$N–MX$_3$R Molecular Complexes: Effects of Organic Substituents**

Brittany Zehner, Patrick Treacy  
Faculty Mentor/Collaborator: James Phillips  
Poster #: 123

Our research concerns the structural and energetic properties of molecular complexes (two otherwise stable molecules associating). Specifically, we are concerned with complexes of the form: NH$_3$-MX$_3$-R, where M = Si or Ge; X = F or Cl; and R= CH$_3$ or C$_6$H$_5$. This presentation focuses on how changes in the “R” group effect structural properties. These compounds are interesting because they may be prone to structural changes in different chemical environments, which could lead to nanotechnology applications. These systems were modeled using computer simulations of electron distributions and bonding to determine equilibrium structures, binding energies, and vibrational frequencies for a series of H$_3$N–MX$_3$-R complexes. We found that the optimum structure of the CH$_3$-containing systems usually has the “R” group and NH$_3$ bonded on opposite sides (axial) of the M atom, whereas the optimum structures of the C$_6$H$_5$-containing systems have the “R” group (equatorial) and NH$_3$ (axial) adjacent to one another. Results for the Ge-Cl systems are as follows: The Ge-N distance and binding energy are 2.23 Å and -5.8 kcal/mol for NH$_3$-GeCl$_4$; 2.21 Å and -1.4 kcal/mol for NH$_3$-GeCl$_3$-CH$_3$; and 2.95 Å and -4.4 kcal/mol for NH$_3$-GeCl$_3$-C$_6$H$_5$. Comparisons and trends across Si and F systems will also be presented.
Structure Analysis and Proton Assignment of Mucin Derivative Peptides with Unnatural Amino Acids on the Backbone by NMR Spectroscopy
Anneka Johnson
Faculty Mentor/Collaborator: Thao Yang

The purpose of this project was to acquire two-dimensional proton NMR data for two synthesized mutant mucin peptides, make assignments for all the hydrogen atoms on the peptides, and analyze for any unique structure present. Mucin peptides are considered to have potential applications in the area of cancer vaccine according to many studies on their biological activity. Two short mucin peptide derivatives based on the native sequence Gly-Val-Thr-Ser-Ala-Pro-Asp were synthesized with the Pro residue substituted by cyclohexylcarboxylic acid (cyHCA) and 4-aminobenzoate (4-aBz). Two-dimensional proton NMR data were used to make assignments of all the hydrogen atoms on the peptides and to verify that the synthesized peptides contained the intended sequences. Hydrogen atoms on the peptides that are in close spatial proximity were analyzed for unique structural features of the peptides. The NMR data collected for each peptide correlate with the expected data based on the known structure of the mucin peptide.

Synthesis and Purification of Biocompatible Nanoparticles for Protein Dynamic Studies
Ashley Lato
Faculty Mentor/Collaborator: Jennifer Dahl

Nanoparticles have emerged as important tools in biomedicine, with numerous clinical applications such as imaging contrast agents, drug and gene delivery systems, and hyperthermic cancer treatments. However, thorough investigation of their impacts on biomolecular systems remains underexplored. Developing a functional knowledge of these interactions can be used to design biocompatible nanoparticles for various medicinal applications. The primary interest of this project has been to synthesize nanoparticles and study their impacts on the structure and function of an important family of enzymes known as aminoacyl-tRNA synthetases, which are responsible for attaching amino acids to a conjugate tRNA molecule. Gold and silver nanoparticles, with ranging differences in core size and functionalization groups, were synthesized and purified using a variety of methods. Two biocompatible ligands were utilized, including citrate and 2-[2-(2-Mercaptoethoxy)ethoxy]ethanol, which was synthesized and characterized prior to use. These nanoparticles were used to examine their impact on the conformation and function of E. coli prolyl-tRNA synthetase using intrinsic fluorescence.

Synthesis of an Oligoethylene Glycol Solubilized Crankshaft Lactone Molecular Switch
Eva Charlesworth-Seiler, Yunuen Torres
Faculty Mentor/Collaborator: Bart Dahl

Large planar conjugated systems exhibit extraordinary capacity for conductivity, fluorescence, and absorption of UV and visible light. Our previous work has proved terphenyl lactone systems are capable of electronic character augmentation by breaking lactone tethers to afford nonplanar structures, thus disrupting conjugation. Increasing the number of aryl rings in excess of three rings results in a diminishing and convergent effect on desired property enhancement. Molecular switches are essential to emerging studies of drug delivery and molecular electronics and have recent applications in polymer adhesive chemistry. Terphenyl lactones remain uncharted in the literature with our group’s preliminary study being one of only a few examples. There is a distinct opportunity to hone in on structural conditions that optimize useful properties of compounds containing the terphenyl lactone subunit. The goals of this
research are to (1) synthesize new moieties marked by improved solubility in organic solvent (2) confirm stoichiometric conditions for reversible switching between open and closed states with pH and redox as the stimuli (3) characterize the unique UV-Vis or fluorescence signals associated with each state, and determine number of effective switching cycles the molecules can tolerate.

**Synthesis of Cyclic Antigenic MUC1 Mimotopes**  
**Andrew Lynch**  
Faculty Mentor/Collaborator: Thao Yang  
Poster #: 115

The immune system responds to antigens via specific sequences called epitopes. The antibody binding amino acid epitope PDTRP within the variable tandem repeat (VNTR) domain of the Mucin1 (MUC1) transmembrane epithelial glycoprotein has been found to be a tumor-associated antigen, capable of inducing an immune response. After the epithelial cell undergoes an epithelial mesenchymal transition (EMT), transitioning into a replicating tumor cell, the MUC1 glycoprotein becomes hypoglycosylated thus exposing the underlying VNTR domain to the extracellular environment and becoming immunologically active. We have synthesized a truncated cyclic mimotope (Aza-Pro-Asp-Thr-Pra-Lys) of the VNTR domain via solid-phase peptide synthesis and copper-catalyzed alkyne-azole cycloaddition (CuAAC) and isolated it via HPLC. The mimotope structure was characterized by 2D 1H NMR via TOCSY and ROESY experiments. Although the cyclization appeared to be a success the synthesized mimotope was not found to bind to the mAb SM3 at any of its hydrogens as no saturation transfer effects were detected via STD NMR.

**Synthesis of Mucin Peptides and Peptide-Antibody Interactions**  
**Ryan Swenson**  
Faculty Mentor/Collaborator: Thao Yang  
Poster #: 186

The MUC-1 mucin is a heavily glycosylated transmembrane protein found on the apical surface of epithelial cells with a short cytoplasmic end and a longer extracellular domain consisting of multiple 20-amino acid tandem repeats. The known roles of mucin protein include cell to cell interactions, protection of the cell, and lubrication of the cell’s surface. In tumor cells the protein has alteration of its carbohydrate chains, thus exposing the core protein to the immune system, appearing as a foreign entity. This study is focused on synthesis of mucin peptides that have binding properties to the monoclonal antibody produced against the mucin from tumor cells. We synthesized three mucin epitopes based on the sequence Gly-Val-Thr-Ser-Ala-Pro-Asp (GVTSA), with the Pro residue substituted by cyclohexylalanine, 4-amino-benzoic acid, and phenylglycine. Synthesis of the peptides was accomplished using the solid phase peptide synthesis technique. The preliminary antibody-binding study of GVTSA-4aBz-D epitope indicates that there are interactions at the methyl groups of alanine and valine, as well as at the aromatic ring of 4-aminobenzoate, as well as at the glycine H and Serine H.

**Use of Geometrical Docking Algorithm to Explore Species Specific Differences in Prolyl-tRNA Synthetases**  
**Cole Theisen, Clorice Reinhardt**  
Faculty Mentor/Collaborator: Sudeep Bhattacharyay  
Poster #: 87

Prolyl-tRNA synthetases belong to a class of enzymes that play pivotal roles in protein synthesis. These enzymes are responsible for attaching the amino acid proline to the 3’ end of the prolyl-tRNA. The structures and domain architectures of these enzymes differ considerably between human and their pathogenic analogs. Identifying the differences of recognition elements present in the two active sites can lead to selective inhibitors based on structure. In the present study, computer-aided docking and
simulations have been carried out on several substrate (proline) and inhibitor (halofuginone) analogs. Students of Biophysical Chemistry Fall 2016 and the core research team adapted automated docking protocols to this system. A quantum/classical treatment was employed to accurately determine the binding affinities of these molecules. Understanding of the specific differences in the binding of these two groups in the human form can serve in our understanding of the species specific differences. Preliminary results show excellent agreement with experimental structures, showing promise for this goal. In the future, we aim to accurately model and predict the effects of novel ligand binding in both pathogenic and mammalian forms, aiding the development of novel antibacterials.

**When Push Comes to Shove: Limitations of Hydrogen Bonded Liquid Crystal/Inhibitor Networks**

Charles Lindberg, Matthew Dietlin  
Faculty Mentor/Collaborator: Kurt Wiegel  
Poster #: 177

A liquid crystal is a state of matter simultaneously displaying properties of both a liquid and a solid. A common misconception is that states where liquid crystals exist are quite fragile and small. This project aims to push these states to gain a greater understanding of the limitations of liquid crystal complexes. Two bisacid donors, tetraethyleneglycoxy-bis-4-benzoic acid (4EOBBA) or tetraethyleneglycoxy-bis-4-naphthoic acid (4EOBNA), are combined with two different acceptors, 4,4-bipyridyl (bipy) or 1,2-di(4-pyridyl)ethylene (2RP) by way of hydrogen bonding. These combinations are then crosslinked with one of three possible inhibitors: 2,2-dimethyl-1,3-di-(4-pyridyloxy)propane (2PD), 1,1,1-tris(4-pyridloxy)methylene) ethane (3PD), or tetrakis(4-pyridyloxymethylene) (4PD). These hydrogen-bonded liquid crystal networks are studied as a function of temperature using differential scanning calorimetry (DSC). These studies are then compared against one another to determine how changes in acceptor and inhibitor affect the observed mesophases. The networks are also studied optically through thermal polarizing light microscopy which allows for direct observation of the physical changes that the networks undergo. By learning how incorporating inhibitors into hydrogen bonded liquid crystal complexes directly affects the networks produced, there is the potential to better understand how to fine tune networks of this sort for future application in the electro-optical display industry.

**Geography and Anthropology**

**Assessing the Factors Influencing Water Use in Austin, Texas**

Jesse Friend  
Faculty Mentors/Collaborators: Cyril Wilson, Garry Running  
Poster #: 191

Water plays an important role in the domestic, agricultural and industrial domain and therefore its supply and quality are crucial to maintain. Water supply can be influenced by a number of factors with potential implications for its quality and availability. The goal of this project is to examine the spatial patterns of water use in Austin, TX and gauge the factors influencing its use. Key demographic variables are regressed on water use data in a bid to give insight on the factors affecting the spatial and temporal patterns of water use in the study area. Demographic variables utilized include median household income, educational attainment, size of household, average parcel size, and micro-climate data. Furthermore, this study predicted the midterm future water use for the City of Austin by 2025. This project is important as climate change will continue to modify our world, making sustainable resource use much more crucial to a nation. Understanding the factors of water use will provide functional knowledge to adjust policies and practices of people around the country. This project’s results help determine what accounts for water use...
in Austin. Individuals and policy makers can use this information to adapt their future water use to more sustainable practices.

**Discovering a Holocaust Era Escape Tunnel: GPR investigation at Ponar, Lithuania**

Jackelyn Seamans, Thomas Wavrin, James Erickson, Alexander Kleinschmidt

Faculty Mentor/Collaborator: Harry Jol

Poster #: 173

Over 100,000 individuals were killed in Ponar Forest, Lithuania from 1941-1944. Eighty Jewish prisoners forced to burn the bodies of the victims were held in the forest for roughly a year. In an attempt to escape, they dug a 30-meter tunnel over the course of 70 days. Eleven people were able to survive the escape to tell the tragic story. The objective of the research is to locate the proposed tunnel and bring scientific validation to the survivors’ stories using ground penetrating radar (GPR) survey. GPR is a noninvasive geophysical technique to image the subsurface using high frequency electromagnetic (EM) pulses. The pulses are sent into the ground from a transmitting antenna and are then reflected to the surface and received by a second antenna. Based on survivor testimonies and prior research conducted at the site, a 10x20 meter grid was laid out for investigation. Data was collected along 40 parallel lines spaced 0.25 meters apart at a frequency of 225 MHz using a pulseEKKO 1000 GPR system. Results of the processed data showed irregular subsurface stratigraphy located 3-4 meters beneath the surface. The interpreted anomalies are determined to be the tunnel based on the location and dimensions.

**Geoarchaeological Investigations of Glacial Lake Agassiz and Holocene Alluvial Deposits within the Buffalo River Valley, Northwestern Minnesota**

Kira Kuehl, Elizabeth Fedewa

Faculty Mentor/Collaborator: Garry Running

Poster #: 190

Geoarchaeological investigations conducted in the Minnesota State University – Moorhead’s (MSUM) Buffalo River Regional Science Center (BRRSC) in northwest Minnesota. The BRRSC is located approximately 15 miles east of Moorhead, MN, within the Buffalo River Valley where it incised into ice-contact, glaciodeltaic, and offshore glaciolacustrine deposits along the eastern shore of Glacial Lake Agassiz. Archaeologists have determined the study area is a significant loci of prehistoric occupation throughout mid-Holocene to the present due to its association with a tight mosaic of vegetation communities (and resources preferred by humans). Our contribution to MSUM’s research is to delineate surficial deposits within which in situ cultural material may be preserved. Aerial photographs are interpreted using GIS methods to map Buffalo River channel migration since 1939. The channel has actively migrated since initial incision ceased in the early Holocene and much of the valley is composed of historic floodplain deposits. Prehistoric deposits in the valley are restricted to valley margins and adjacent bluffs. Remnants of low terraces, some buried by eolian deposits are locally preserved along valley margins. We recommend archaeologists at MSUM focus their efforts to locate in situ evidence of human occupation in the areas we have identified as prehistoric deposits.

**Ground Penetrating Radar as a Method for Archeological Investigation: Rhodes, Greece**

Jackelyn Seamans, Alexander Kleinschmidt

Faculty Mentor/Collaborator: Harry Jol

Poster #: 219

Rhodes, Greece is widely known for the Colossus of Rhodes, one of the Seven Wonders of the Ancient World. A portion of the island, The Medieval Old Town of the City of Rhodes, was declared a World
Heritage Site due to its preserved historic sites. Ground penetrating radar (GPR) was conducted at several sites throughout the Old Town using a pulseEKKO 1000 Sensors and Software system. We will focus on the value of GPR as a noninvasive method used in the archaeological investigation at the Palace of the Grand Master of the Knights of Rhodes. Throughout the palace grounds, 3 survey grids where collected. The investigation sought to locate remnants of a castle wall created during Byzantine rule and locate a portion of the Colossus, which is hypothesized to have stood on the palace grounds. Over 100 GPR transects were collected with an antenna frequency of 225 MHz and step size of 0.05 meters. Processing of the data using various GPR software programs resulted in 2D profiles and 3D images. Analysis of the results show significant subsurface anomalies interpreted as historic remains, including the Byzantine wall. The results from the investigation can be used to facilitate future excavation.

**A Ground Penetrating Radar Investigation of Archaeological Sites in Varniai Regional Park, Northwesetern Lithuania**

James Erickson, Jackelyn Seamans, Thomas Wavrin, Alexander Kleinschmidt

Faculty Mentor/Collaborator: Harry Jol

The Varniai Regional Park, located in Northwestern Lithuania, is considered a hub of Mesolithic and Neolithic Baltic culture and contains many sites of importance to Lithuanian history. In July of 2016, non-invasive archaeological investigations were conducted at two different sites in the Varniai Regional Park by means of ground penetrating radar (GPR). The two sites share a similar research goal. In prehistoric times, people settled at or near lake shorelines leaving cultural remains behind. As lake levels changed many of these shorelines became buried under a layer of peat. Due to difficulties in conducting archaeological excavations in this peaty environment, knowing the location of an ancient shoreline is important. Four GPR transects of varying lengths were collected with Sensors and Software PusleEKKO 100 and PusleEKKO 1000 GPR systems at 100, 200, and 225MHz with step sizes of 0.5, 0.05, and 0.05 meters respectively. Topographic data collected with a TopCon laser leveler was used to geometrically correct the GPR data. The resulting transects reveal the truncation of continuous horizontal layers by dipping reflections which are interpreted as ancient buried shorelines. GPR data collected from these two sites have proven useful in identifying desired locations for future archaeological excavations.

**Ground Penetrating Radar Provides Evidence for the Previously Unrecognized Danaher Channel near Seney, MI, USA**

Madeline Hynek, Jackelyn Seamans, Alexander Kleinschmidt

Faculty Mentor/Collaborator: Harry Jol

It is common belief that glacial meltwater from Lake Superior flowed to the Atlantic Ocean through a northeasterly channel before the St. Mary’s channel existed. However, recent geomorphological evaluations of Upper Michigan suggest that a Holocene-era channel (Danaher Channel) cut through Upper Michigan, which provided a path for the meltwater from Lake Superior to Lake Michigan. Ground penetrating radar (GPR) data (800 meters in length) were collected roughly 11 kilometers southeast of Seney, MI, to provide subsurface evidence for this theory. GPR is a survey method that utilizes antennae that transmit electromagnetic (EM) energy into the ground, which reflect off materials of different dielectric properties. The reflected EM waves return to the antennae and create an image of the subsurface. A Sensors and Software pulseEkko100 GPR system was used to collect two transects with step sizes of 0.5 meters and an antennae frequency of 100MHz. Using the EKKOproject software program, line views of the transects were processed by adding wiggle traces and using Dewow+AGC gain to precisely image the stratigraphic properties of the facies. Semi-continuous layers truncated by sub-
horizontal layers provide evidence for the Danaher Channel. Further GPR lines are proposed to more accurately determine the path of this channel.

**Identifying the Great Synagogue of Vilna in Vilnius, Lithuania**

**Thomas Wavrin**  
Faculty Mentor/Collaborator: **Harry Jol**

Since 1957 the remains of the Great Synagogue of Vilna in Vilnius, Lithuania has been hidden under an elementary school. An international team of scientists are using ground penetrating radar (GPR) to identify the buried remains of the synagogue and then excavate the most promising locations. GPR is a non-invasive survey technology which sends electromagnetic waves into the subsurface and records the reflected waves. A pulseEKKO 1000 GPR unit with 225 MHz antennae was utilized to collect grid datasets. The presentation will focus on two grids, #7 (32 x 5 m) and #8 (33 x 5 m), in which transects with a step size of 0.05 m were collected 0.25 m apart. Following data analysis, Grid #8 has a linear feature which is interpreted as a pipe above the synagogue’s destruction layer as well as a several proposed archaeological features in the eastern corner. Grid #7 has a variety of anomalies located throughout the grid. The research results will aid in directing future archaeological work at the former site of the Great Synagogue of Vilna.

**Interpretation of the Duluth-Superior Barrier System: Analysis through Models and Ground Penetrating Radar Data**

**Richard Mataitis**  
Faculty Mentor/Collaborator: **Harry Jol**

Barrier Island geomorphology is a complicated subject due to the various coastal environments where barriers form, and variations in sediment supply and sea level. The Duluth-Superior Barrier System (DSBS), home to the Duluth Seaway Port, has received little investigation from scientists. Past UW-Eau Claire research students collected ground penetrating radar (GPR) data from two spits that compose the system. After a literature review that compiled models of formation and stratigraphy of previously studied marine and fresh water barrier systems, the study presents the interpretation of the DSBS through processing and analyzing previously collected GPR field data. Interpreting the stratigraphy to develop a geomorphic chronology of formation was influenced by the literature review. GPR systems record the return of electromagnetic energy reflected from the subsurface lithology and structure. These returns were stored as raw data and then processed using EKKO Project software to display the stratigraphy as 2-D and fence diagrams. Results of the study aid in better understanding the processes of formation, Holocene lake level fluctuations, and an understanding of geomorphic processes occurring in the modern system. Research results pertaining to current geomorphic processes provide conservation groups with information to aid in habitat restoration of the area.

**Locating Jacob Gens: A Subsurface Geophysical Investigation in Rasu Prison, Vilnius, Lithuania**

**James Erickson, Jackelyn Seamans, Thomas Wavrin, Alexander Kleinschmidt**  
Faculty Mentor/Collaborator: **Harry Jol**

Jacob Gens, a Lithuanian Jewish army officer who held senior leadership positions in the Vilnius Ghetto was shot by the Nazis and buried with his journals within the courtyard of Rasu Prison, Vilnius, Lithuania. The objective of the project was to try to non-invasively locate the burial site of Jacob Gens. To search below the grassed prison yard we used a Sensors and Software pulseEkko1000 ground penetrating radar (GPR) system. To provide adequate depth of penetration, vertical and horizontal
resolution, an antennae frequency of 225 MHz was utilized with a step size of 0.05 m along grid transects. The transects were collected 0.25 m apart with 43 lines in the x-direction and 63 lines in the y-direction, resulting in a 13 x 16 m grid. Using EkkoProject and Voxler software programs the collected transects were collated and processed to provide 2D and 3D views of the datasets. Using radar stratigraphic principles and burial site dimensions of 2 m x 1 m, a possible location has been identified and proposed for future excavation.

**Medvėgalis: A GPR Study of the Medieval Fort in Lithuania**  
*Luke Burds, James Erickson, Jackelyn Seamans, Thomas Wavrin, Alexander Kleinschmidt*  
Faculty Mentor/Collaborator: Harry Jol  
Poster #: 172

Located on the western border of the Baltic state of Lithuania, Medvėgalis was one of the strongest and most important Middle Age hillforts in the region. First mentioned in written text in 1316, Medvėgalis served as a strategic defense point against invading Crusaders until its destruction by the Teutonic Knights in 1329. Due to Lithuania being the last European country to be Christianized, the hillfort is a significant historical and cultural symbol for Lithuanians. In July of 2016, ground penetrating radar (GPR) surveys were conducted at the fort’s location with the purpose of non-invasively locating areas for future archaeological investigation. Two transects and a 10x7 meter grid were collected using a pulseEKKO 1000 system with 225 MHz antennae, and a step size of 0.05 meters. Topographic data was gathered and geometrically corrected with a TopCon laser leveler. Using GFP Edit, EKKO_Project and Voxler visualization software, the data was processed resulting in 2D profiles and 3D images of the subsurface, which highlighted areas of strong radar reflections and anomalies where the remains of Medvėgalis are thought to be preserved. The findings will provide a better understanding of the fort’s location, and assist archaeologists in locating areas for future excavation.

**Soils and Land Use at the Henning’s Lonesome Apple Tree Ridge Site, Eau Claire County, Wisconsin**  
*Kayla Coonen*  
Faculty Mentor/Collaborator: Garry Running  
Poster #: 171

The purpose of this poster is to present the results of research designed to provide land use recommendations based on observed soil characteristics. University of Wisconsin-Eau Claire geography students investigated the study area, about ten acres within the exurban fringe located near the town of Bracket, WI. The study area is characterized by a steep north facing bedrock controlled slope where sandstone bedrock is overlain by terminal late-Pleistocene loess. Pedestrian reconnaissance revealed that slope steepness is the most important soil forming factor to consider. Four soil pits were excavated on a transect along the slope from slope shoulder to the foot slope position. Soil profiles exposed in those pits were described using the standard USDA NRCS methods. Soils in the study area are mapped as Seaton Silt Loam, 12 to 18 percent slopes. Soil profiles observed exhibit A-E-Bt-C-2C horizonation. Downslope movement occurred before, during, and after loess deposition. Reworked loess is thickest, and soil development (including e-horizon thickness, structural grade, clay skin development, mottingling and gleying) are strongest in lower slope positions. The soils are fertile but are associated with limitations such as erosion. Therefore, mitigating soil erosion must be prioritized whatever land use decisions are made.
Spatial and Contextual Analysis of Post-Independence Regional Migration in Ghana
Stephanie Frempong-Longdon
Faculty Mentors/Collaborators: Cyril Wilson, Garry Running

Regional migration is a common phenomenon in developing countries, where push-pull factors of migration favor rural-urban flows. The purpose of this study was to produce a spatial and contextual analysis of regional migration in Ghana following its independence from Britain in 1957. Using census data from the Ghana Statistical Survey, the demographic variables of gender, age, education level, employment, and marital status were quantitatively analyzed. This analysis was done to provide insight into Ghana’s regional migration dynamic between 1960 and 2010. Moreover, multiple regression models were developed to explore potential reasons for migration. Researching this topic is significant because it helps further the understanding of why migration is happening, as well as who is participating in the regional migration. Implications from this study can provide insight that could be beneficial for future regional and national planning.

Subsurface Imaging of the Manistique Embayment, USA: Past Shorelines of Lake Michigan
Madeline Hynek, Jackelyn Seamans, Alexander Kleinschmidt
Faculty Mentor/Collaborator: Harry Jol

Lake Michigan has experienced water level fluctuations since its formation 14,000 years ago. These fluctuations have formed a set of visible sand ridges parallel with the current Lake Michigan shoreline and can be seen along the Manistique Embayment located in Michigan’s Upper Peninsula. The most prominent water level fluctuation occurred during the mid-Holocene period when the lake level was at its highest (~4 meters) and is known as the Nipissing phase. The purpose of this research is to determine how the Nipissing high affected the shoreline of Lake Michigan. Using ground penetrating radar (GPR), a noninvasive geophysical technique used to image the subsurface, a 1,100-meter-long transect of the embayment was collected. The GPR system used was a pulseEKKO 1000 with an antennae frequency of 100 MHz. Data was collected using a step size of 0.25m and an antennae separation of 1m. Using a Topcon laser level, the topography of the GPR line was collected. The raw data was processed using Sensor and Software’s EKKOpro. The results of the GPR transect show evidence of coastal processes including progradation and aggradation associated with beach ridge formation and will contribute to refining the present paleohydrograph of Lake Michigan.

Topo-Bathy LiDAR Analysis of Coastline Change on the Southern Tip of Cape Cod, Massachusetts
Scott Nesbit
Faculty Mentor/Collaborator: Cyril Wilson

Coastal erosion and morphologic changes are affecting coastlines around the globe. Coastal regions need to understand the way in which their landscapes change to prepare for floods due to sea-level rise or large scale storms. The investigation examined approximately the southern nine miles of Cape Cod for morphological changes along the coastline. The area contains Monomoy Island which is home to the Monomoy National Wildlife Refuge. Monomoy refuge makes up 8 of the approximate 9-mile study area and is 7,604 acres in size. LiDAR derived elevation models were created from Topo-bathy LiDAR collected by NOAA in 2007 and 2010. ArcMap 10.4.1 software was utilized to calculate elevation change between the two years. The research determined the weighted average of elevation change throughout the
study area. Additionally, the research determined the percent of each elevation change in the study area. These results will help guide coastal planners to areas of concern to help develop a plan to protect or prepare for future adverse changes along the coastline.

Geology

Chemical Diffusion in Watermelon Tourmaline: Parallel versus Perpendicular to C-Axis
Kyle Tollefson
Faculty Mentor/Collaborator: Phillip Ihinger

The chemical composition of tourmaline can provide unique insights into the thermal evolution of their growth environment, including that of pegmatites (in igneous systems) and hydrothermal veins (in metamorphic systems). With its wide open channels that run parallel to the crystallographic c-axis, the tourmaline lattice structure can accommodate a wide range of contaminant species. It is well known that multiple absorption bands in the infrared spectrum can be characterized to document the uptake of dozens of individual hydroxyl-bearing contaminant species within single tourmaline crystals. In a companion abstract (this volume), we show that concentration gradients in several of these contaminant species can be used to document diffusion during post-crystallization thermal evolution. The diffusion of these species may be the cause of the color variation in these samples. Here, we examine a single crystal of watermelon tourmaline with prominent color variations both perpendicular and parallel to the c-axis. We compare the gradients in chemical contaminants as measured using high-resolution micro-infrared spectroscopy both parallel and perpendicular to the c-axis to determine if the color variation is related to observed abundances in hydroxyl species.

Comparison of Hydrothermal Alteration Zones Associated with the Flambeau and Eisenbrey Massive Sulfide Deposits, Rusk County, WI
Chase Friedemann, Eli Fredrickson
Faculty Mentor/Collaborator: Robert Lodge

The Flambeau and Eisenbrey deposits are Precambrian Cu-Zn-Pb-Au-Ag massive sulfide ore bodies found in Rusk County, WI. Sulfide mineralization at these deposits is associated with distinct metamorphosed hydrothermal alteration zones that can provide information about the depositional and hydrothermal histories of the region. Samples from drill core from these deposits were geochemically and petrographically characterized by using X-ray fluorescence and transmitted light petrography, respectively. Mass balance calculations will also be conducted in order to provide insights to the physical and chemical properties of the hydrothermal fluid of these alteration zones. The Flambeau alteration zone is characterized by varying amounts of biotite ± chlorite ± andalusite. The Eisenbrey alteration zone is characterized by varying amounts of quartz + biotite ± chlorite ± anthophyllite ± cordierite ± pyrite. The alteration zones differ in their mineral assemblages which is partly due to the composition of the protolith and the composition of the hydrothermal fluids. The Flambeau is characterized by an andesite protolith with chlorite-sericite alteration whereas the Eisenbrey is characterized by a dacite protolith with chlorite-pyrite alteration.
**Competition of Diffusion Pathways in High-Temperature Metamorphic Quartz**

**William Fitzpatrick, Eric Brinza**

Faculty Mentor/Collaborator: Phillip Ihinger

Poster #: 158

We present spectroscopic analyses that characterize the distribution and abundance of hydroxyl-bearing impurities within a single quartz crystal grown in hydrothermal fluid. We focus on a gemmy quartz crystal collected in a vein from the high-temperature Lepontine Zone of the Swiss Alps. We utilize high-resolution (200µm spot size) infrared spectroscopic analyses conducted on traverses across thin (~750µm) wafers cut perpendicular to the c-axis of the crystal. IR-spectra record characteristic peaks associated with HOH, LiOH and AlOH contaminant species. Species concentrations vary vertically and horizontally through the crystal both as a function of uptake during growth and diffusion following growth. We show that all concentration profiles reveal relative diffusion rates with LiOH > HOH > AlOH, and that diffusion toward terminus faces > diffusion toward the base >> diffusion toward prism faces. That is, we show that competing migratory pathways exist within hydrothermal quartz crystals, and that each pathway, as well as their aggregate, can provide valuable information for discerning the post-crystallization thermal histories of their host crystal. Our goal is to determine how the cumulative effects of the separate diffusion pathways interact to produce the observed impurity gradients within the crystal.

**Compilation of Historic Mineral Exploration Data Pertaining to the “Lost” Crandon Cu-Zn Deposit, Forest County, WI: Rediscovering Wisconsin’s Largest and Most Controversial Massive Sulfide Deposit**

**Lucy Horst**

Faculty Mentor/Collaborator: Robert Lodge

Poster #: 130

The objective of this research is to collect and digitize lithologic, geochemical, and photographic data found within rare, historic mining reports, memos, articles, and core samples from the proposed Crandon Cu-Zn mine in Forest County, WI. This data aids in rediscovering the geology of the largest volcanogenic massive sulfide deposit in the state of Wisconsin. After failed mine permitting attempts, the deposit was sold to local native tribes that destroyed nearly all of the documentation and drill core obtained during mineral exploration in the 1970s and 1980s. A few of these precious ‘lost’ documents and samples have been discovered at the Wisconsin Geologic and Natural History Survey and the University of Minnesota-Duluth. Geochemistry was obtained through the use of the portable XRF from core samples at the University of Minnesota-Duluth. This digital library will facilitate growth in the research project as well as provide a centralized location to digitally archive future Crandon mine materials. It also provides a modern framework for future 3D modelling of the deposit and mine, essentially rediscovering the largest and most controversial volcanogenic massive sulfide deposit in the state of Wisconsin.

**Evolution of the Manantiales Basin: Miocene Orogenic Patterns in the South-Central Andes**

**Adam Wiest, Carly Mueller**

Faculty Mentor/Collaborator: J. Brian Mahoney

Poster #: 161

The Manantiales basin is a retroarc foreland basin succession flanked on the west by the Cordillera Principal and on the east by the Cordillera Frontal. The basin has been interpreted as a Miocene foreland basin developed in response to Miocene deformation in the east-vergent La Ramada fold and thrust belt. Six geochronologic analyses demonstrates that the base of the Manantiales basin succession is a previously unrecognized Eocene sequence with a maximum depositional age of 38.7 ± 0.2 Ma. The Chinches Formation consists of a lower volcanic succession overlain by a thick coarse-grained clastic
sequence that records progressive uplift of the western orogenic highland. The initiation of the Miocene succession is constrained by a 16.8 ± 0.2 Ma U/Pb age lapilli tuff within the lower volcanic unit, which is coeval with subsidence in the Santa María, Alto Tunuyán, and Cachueta basins to the south. Ongoing thermochronologic (U-Th)/He analyses indicate exhumation initiated at 6-9 Ma, reflecting rapid erosion of the succession during eastward propagation of the La Ramada fold and thrust belt. These data combined with recent geologic mapping, stratigraphic and structural studies provide critical constraints on the development of the Manantiales basin and orogenic history of the south-central Andes.

**Lateral Stratigraphic Variations in the Volcanic Lithofacies of the Eisenbrey Zn-Cu-Pb VMS Deposit, Rusk County WI**

Nathaniel Jackson  
Faculty Mentor/Collaborator: Robert Lodge  
Poster #: 110

The Eisenbrey VMS deposit near Ladysmith, WI is one of many metalliferous deposits that are hosted in the Precambrian rocks in Wisconsin that has gone largely unexplored. Last year our economic geologic research team was able to log and sample drill core, perform geochemical and petrographic analyses, and compile data with the Wisconsin Geological and Natural History Survey (WGNHS) on all of the exposed surface rock, and 3 of the 29 original exploration drill holes. Currently, with ORSP funding and external funds from the WGNHS we have been given the opportunity to sample and produce graphic logs on a prioritized list of the remaining 26 original exploration drill holes. As a product, we hope to develop a regional synthesis by acquiring data on the lateral variation of the metamorphic suite present at the Eisenbrey Deposit. In the almost 20 years since these rocks have been researched, our knowledge of VMS deposits, Precambrian geology, and lithogeochemistry has vastly improved. In addition, improvements in analytical capabilities (e.g. ICP-MS, SEM) have improved our ability to determine the chemistry of these ancient rocks and to interpret their significance to volcanic and tectonic histories.

**Metal Content of Soot from Rural and Urban Air Samples Central Valley of California**  
Samantha Kleich  
Faculty Mentor/Collaborator: Robert Hooper  
Poster #: 159

Cancer clusters in the Central Valley of California have been linked to metal exposure. One suspected pathway for metal exposure is through air particulates and soot makes up a large portion of air particulates in many samples (> 50% during winter samples). Soot is a byproduct of incomplete combustion of any carbonaceous material but primary sources include diesel engines, agriculture (including forest fires), burning of waste materials and transportation. Using the Transmission Electron Microscope (TEM) we are analyzing soot collected by the California Air Resources Board from three different environments; upwind, downwind and within the Central Valley. Upwind soot is fairly uniform in composition, with very low metal contents but soot from urban settings shows both structural and chemical variability and metal contents up to 4810 ppm of Pb, 250ppm of Se and 1450ppm of As. In this study we examine soot from these different environments to evaluate both potential sources for soot and also the possible health effects. In the future, we will be looking at changes in soot composition over time to determine if changing government regulations of fuel contents has resulted in changes in the level of harmful contaminants in soot.
**Metal Sequestration during Aggregation Based Crystal Growth**

Charles Plaziak  
Faculty Mentor/Collaborator: Robert Hooper  
Poster #: 129

Siliceous Ferrihydrite (nominally siliceous-Fe(OH)\textsubscript{3}) is a ubiquitous nanoparticle (NP) phase in natural environments and commonly contains large concentrations of other metals of environmental concern including Pb, Zn, As, Cr, and Ni. Ferrihydrite NP grow into more robust and crystalline Fe-oxyhydroxides through a process of aggregation based crystal growth whereby the ~3nm NP physically rotate and bond to produce phases with increasing degrees of crystallinity which we measure as the crystallinity index (CI). These polycrystalline aggregate clusters further mature to produce long-range crystallographic alignments with a bladed habit. We have created a new CI based on our interpretation of electron diffraction, and direct lattice imaging of crystal structure. This project is focused on determining how associated metals of environmental concern (especially Pb) behaves during aggregation based crystal growth as a function of increasing CI. Initial results indicate no significant decrease in any metal concentrations associated with aggregation based NP growth. Future research will determine if the results are statistically significant.

**Mineralogy and Geochemistry of Garnet in Rhyolite, Black Hills, South Dakota**

Rachel Lair  
Faculty Mentor/Collaborator: Robert Hooper  
Poster #: 141

In western South Dakota are several occurrences of rhyolites containing abundant garnets. Garnets in igneous rocks are usually inherited from melting of a garnet bearing protolith and therefore, carry little information about the actual origin of the rocks. However, in rare cases, some rhyolites actually contain igneous garnet phenocryst which have the potential to be indicators of the provenance of these igneous rock. Igneous garnets can be used to determine the temperature and depth of crystallization, and also the conditions under which the rock further equilibrated on its journey to the surface. This study is looking at the mineralogy of the garnet bearing rhyolites to determine the origin of the garnets and other associated minerals. Thin-sections are being examined using SEM/EDS. Initial results suggest the garnets are indeed igneous phenocrysts; they are free of inclusions of metamorphic minerals, and are associated with ferro-knebelite (Mn-olivine), quartz, fluorine-rich biotite, anorthoclase, plagioclase (~An 30) and Thorium-rich monazites. Continued study of this suite of rocks should allow us to determine more about the igneous history of these rhyolite intrusions.

**Ore Petrography and Compositional Comparison of the Flambeau and Eisenbrey Massive Sulfide Deposits**

Kaelyn Blotz, Will Howard  
Faculty Mentor/Collaborator: Robert Lodge  
Poster #: 112

This study compares the mineralogical and textural variations throughout the ore stratigraphy in the Precambrian Flambeau and Eisenbrey Cu-Zn-Au massive sulfide deposits, located in Rusk County, Wisconsin. These are both examples of volcanogenic massive sulfides (VMS), which are polymetallic mineral deposits that are exploited and mined for their base and precious metals. Mining of the supergene-enriched part of the Flambeau deposit occurred between 1992 and 1997, while the Eisenbrey deposit has not been mined. Using drill core samples that were stored at the Wisconsin Geological and Natural History Survey core repository, we were able to quantify the abundances of different sulfide minerals in different stratigraphic levels of the ore zones and characterize mineral textures and grain boundary interactions using reflected light petrographic and scanning electron microscope techniques.
Despite the close proximity of the Flambeau and Eisenbrey, they each have unique ore mineralogy and stratigraphy. Certain trace minerals form under specific hydrothermal fluid conditions; therefore, observing these mineralogical variations and textures within the ore bodies can provide important information regarding the volcanic and ore-forming environments in which these VMS deposits formed.

**Potential for Komatiite-Hosted Nickel-Copper Mineralization in the Eastern Part of the Shebandowan Greenstone Belt, Ontario, Canada**

Maile Olson  
Faculty Mentor/Collaborator: Robert Lodge  
Poster #: 131

Our research focuses on geochemical and textural evidence of interactions between Archean komatiites and silicic sedimentary rocks near Thunder Bay, Ontario, and exploring the potential for Nickel-Copper-Platinum Group Element (Ni-Cu-PGE) deposits in this region. In addition, petrographic and geochemical study of these rocks can improve our understanding of Archean tectonic processes. When ultramafic magmas assimilate sulfur-bearing crustal rocks, they can form Ni-Cu-PGE deposits which were mined in other komatiite deposits in the Shebandowan belt. Komatiites are exclusively formed during the Archean when early Earth was hot enough to produce large volumes of mantle-derived magmas. This increases the potential for magma-sediment interaction that have produced other Ni-Cu-PGE deposits elsewhere in the greenstone belt. Detailed field mapping of bedrock exposures, transmitted-light petrography, and whole rock geochemical analyses were used on samples collected. Textural evidence can be used as a good indicator of komatiite-sediment interaction since original textures have largely been preserved due to minimal deformation and metamorphism. Preliminary results of textural and petrographic analyses provide indication of komatiite-sediment intermingling.

**Preliminary Characterization of Native American Glass Beads Using IR Spectroscopy**

Jackelyn Anderson, Kyle Tollefson  
Faculty Mentor/Collaborator: Phillip Ihinger  
Poster #: 157

We present preliminary results on the nature of dissolved water in glass beads related to Native American connections with early European traders and explorers. Our study involves the first investigation of these glass artifacts using infrared spectroscopy in order to examine water content and water speciation in the glass structure. The water content is a direct measure of the integrity of the glass (determining how long before it devitrifies), and the speciation can be used to determine how quickly the glass cooled as it was formed. Both of these measurements can potentially be used to help determine how and when the bead was manufactured. We present measurements on a series of authentic Native American beads, including samples recovered from archaeological sites and private collections. In future studies, we will compare compositions of authentic artifacts to those manufactured at different European locations in order to deduce the sources of the Native American beads. Additionally, our results can shed light on the aging and production processes of these beads, including the valuable deep blue (Padre) beads.

**Prospecting through TEM Analysis of Metallic Nanoparticles in Groundwater**

William Fitzpatrick  
Faculty Mentor/Collaborator: Robert Hooper  
Poster #: 140

With the search for new deposits of metallic resources pushing prospecting into increasingly poorly exposed areas, this project aims to test an experimental prospecting technique developed in China to discover potential zones of mineralization in areas where host units may have little to no outcrop. Potential detection of metallic ore bodies is achieved through TEM analysis of nanoparticles within
groundwater samples collected in an area of interest, with their characteristics providing evidence for the existence of an ore body located at depth. To verify this method, groundwater samples have been collected from two areas with known metallic deposits, the Eagle Mine in the Upper Peninsula of Michigan and the Kingston Mining district in New Mexico. Initial results have shown a positive correlation of metals in nano-particle chemistry from areas of mineralization. In samples from the Eagle Mine, metallic components of nanoparticles include Cr up to 10,000ppm, Zn up to 22,000ppm and Co up to 620ppm while analyses of nanoparticles within Kingston groundwater reveal a large component of Zn from 5-13%. If this method continues to show promise, it could be used in a future project to provide evidence for or against existence of an ore body in a targeted location, possibly in combination with other prospecting methods such as hydrogeochemistry.

Provenance of the Paleocene-Eocene Oyster Bay Formation, British Columbia
Jane Williams
Faculty Mentor/Collaborator: J. Brian Mahoney

The Oyster Bay Formation is a recessive, thin-bedded, fine-grained succession that disconformably overlies the Upper Cretaceous Nanaimo Group in isolated exposures along the eastern coast of Vancouver Island, British Columbia. The Formation consists of thin-bedded siltstone and sandy siltstone intercalated with lesser medium bedded feldspathic sandstone. Large calcareous concretions occur at three distinct stratigraphic intervals, and contain permineralized fossil plants, gastropods, decapods, corals, echinoderms, bivalves, and foraminifera. These fossils, coupled with fossilized crab burrows, suggest a shallow marine depositional setting. Paleontology and palynology suggest a Paleocene to Eocene age. Petrographically, the unit contains primarily of fine-grained micaceous feldspathic arenite to wacke, dominated by very angular clasts of plagioclase, quartz, biotite, and potassium feldspar. Locally, fossil fragments of brachiopod shells and bryozoans, organic material, and volcanic lithic fragments are evident. Detrital zircon provenance analysis suggests the Formation is dominated by Jurassic to Cretaceous detritus derived from the Coast Plutonic Complex to the east. This detrital zircon signature is strikingly similar to the subjacent Nanaimo Group, suggesting derivation of sediment due to erosion of the underlying strata. However, the unit is dominated by fine-grained, very angular mineral fragments indicative of a first-cycle, texturally immature sediment, not a second cycle sediment.

Geology and Materials Science & Engineering

Mobility of Trace Metals in Western Wisconsin Sediments Determined by Microwave Assisted Sequential Extraction Procedure
Carly Mueller, Melissa Hackenmueller, Adam Wiest,
Faculty Mentors/Collaborators: J. Brian Mahoney, Laurel Mc Ellistrem

The rapid expansion of industrial silica sand mining in western Wisconsin has generated increased concern about the potential impacts to surface water and groundwater conditions. One concern is that exposure of sediments during the mining process may liberate trace metals that will contaminate regional surface water and groundwater. This project utilizes a sequential extraction technique to mimic the natural conditions to quantitatively determine the true mobility of trace metals in the natural environment. The sequential extraction technique uses a five stage iterated process that include; 1) exchangeable soluble metals (MgCl2 @pH 7.0); 2) carbonate and organic bound (Na-Acetate buffer @pH5.0); 3) hydroxide bound (hydroxylamine hydrochloride); 4) sulfides and organic matter (H2O2 @pH2.0); 5) residual fractions (HCl/HNO3). The resulting data quantifies the concentration of each element held in the
exchangeable, carbonate, hydroxide, organic and mineral fractions of the original sediment. Sequential extraction is critical to understanding how trace metals found in the Eau Claire and Lone Rock formations within western Wisconsin may mobilize to the surface water and groundwater.

**Wisconsin’s Water: Establishing an Environmental Trace Metal Baseline for Responsible and Reasonable Regulation**
Adam Wiest, Derek Lindquist, Carly Mueller, Melissa Hackenmueller
Faculty Mentors/Collaborators: J. Brian Mahoney, Stephen Sellwood, Laurel McEllistrem

The dramatic expansion of industrial silica sand mining in western Wisconsin has generated immense public concern about the potential environmental impacts to surface water and groundwater conditions. The Wisconsin Department of Natural Resources has proposed water quality regulation on silica sand operations that the industry considers onerous. This investigation will establish the first comprehensive baseline documenting background variations of ~25 trace metals in Wisconsin’s natural waters. This study will constrain the mobility and concentration of trace metals that occur naturally in geologic formations via the chemical analysis of ~60 surface water, 20 municipal groundwater, and combined whole rock geochemistry and sequential extraction techniques. Preliminary results show limited trace metal mobility between geologic formations and surface water and groundwater, suggested by metal concentration values (e.g. arsenic, lead, chromium, zinc) measured orders of magnitude below federal drinking water standards. Our future analysis integrating these data with site-specific analyses of surface water and groundwater at mine sites will quantify the potential contaminants generated during the mining process. These data are vital to the development of reasonable and responsible environmental safeguards that will facilitate economic growth and sustainable development of the silica sand industry, while safeguarding water resources and public health in western Wisconsin.

**Geology and Watershed Institute and Housing and Res Life**

**Sustainability Behaviors of University Students: An Analysis of On-Campus Waste Disposal Habits**
Betty Walter, Anna Brickheimer, Ashley Thompson, Katrina Kawak, Richard Mataitis, Samantha Kleich, Lauren Graves, Tabitha Schafer
Faculty Mentors/Collaborators: Scott Clark, Karen Mumford, Kate Hartsel

A 2015-16 on-campus survey showed that UW-Eau Claire students are interested in sustainability, yet the compost and recycling bins in Davies Student Center are poorly utilized. The goal of our research is to help the university become more sustainable by encouraging students to improve their waste-disposal habits. To that end, we audited the use of the compost, recycling, and landfill bins at Davies Center during the fall 2016 semester. The audit consisted of sorting and counting individual items collected from bins during the lunch hour on three successive Tuesdays in November. Our results showed that only 75% of plastic bottles and 50% of aluminum cans are recycled. Most (over 83%) other recyclable plastic containers are improperly placed in the landfill bin; as is over 84% of food waste. Most compostable plates (78%) and clamshell to-go containers (57%) are also put into the landfill bin. A key issue is the combining of various wastes into single containers that are disposed of in the landfill bin. As we work towards our goal of a sustainably minded campus, our findings have been used to redesign the recycling bins and they form the basis of a marketing campaign that is educating the university community.
Materials Science & Engineering

 Computacional Study of the Surface Stability of Li₃AlN₂ and AlN₂ as Cathode Materials for Lithium Ion Batteries

 Kenneth Ellingsen  
 Faculty Mentor/Collaborator: Ying Ma  
 Poster #: 84

 While lithium ion batteries are the most widely used energy storage devices in consumer electronics, one limitation that decades of development has failed to overcome is their maximum capacity. Recently, Li₃AlN₂ and AlN₂ have been identified as promising high capacity cathode materials. However, while initial experimental data shows unprecedented high capacities, the capacity rapidly decreases upon multiple charge/discharge cycles. This project seeks to analyze the surface structures of Li₃AlN₂ and AlN₂ through computational studies in order to determine the role of surface distortions on the electrochemical instability that leads to capacity fading. Surface energies of various low index surfaces will be calculated and the structural distortions will be analyzed. Novel strategies, including the use of carbon and aluminum coatings, to minimize surface distortion will be tested. The results of this project will yield a deeper understanding of these materials and a possible improvement in their energy storage capabilities.

 Effects of Overpressure Conditions on the Porosity of Bi-2212 Superconducting Wires

 Grant Hawkins, Alexandra Putney  
 Faculty Mentors/Collaborators: Matthew Jewell, Christopher Hopp  
 Poster #: 85

 Bi₂Sr₂CaCu₂O₈, commonly abbreviated as Bi-2212, is a promising high-temperature superconducting material, the usability of which is limited by its brittle nature. The purpose of this project is to use image analysis software to determine the effects that various overpressure processing conditions used during heat treatment have on the porosity of Bi-2212 superconducting wires. The microscopic-scale properties of materials (such as porosity), often offer key clues as to their macroscopic properties. Therefore, through the study of the porosity of Bi-2212 wire samples, we can develop a better understanding of the brittle nature of the material. This project applies image thresholding technologies in ImageJ and Adobe Photoshop software in order to determine both the absolute porosity area within a sample image, and the porosity as a percentage of filament sub-bundle size. So far, the data supports the idea that as the degree of overpressure used during heat treatment increases, both the total porosity area and the porosity percentage decrease. Further research will examine the role of other microstructural defects, such as parasitic secondary phases, and will investigate an anomaly that is present in the 10 bar samples. We expect this work to help Bi-2212 wire manufacturers and magnet builders to fabricate more robust, strain-tolerant conductors and magnet systems.

 Examining the Viscosity of PEG-PDMAEMA as a Function of Temperature and pH

 Tessa Plautz, Brianna Shoulak, Ayla Hammill, Robert Huber  
 Faculty Mentor/Collaborator: Elizabeth Glogowski  
 Poster #: 127

 “Smart polymers”, a subset of polymers, change properties in response to varying stimuli like temperature and pH. Smart polymers have a wide range of uses from biomedical to environmental applications. There are different types of smart polymers, such as diblock copolymers, which are two separate polymers bonded together covalently. For our polymer system, of the two blocks, one is reversibly hydrophilic and hydrophilic making the copolymer have smart properties. The smart diblock copolymer poly(ethylene...
glycol)-block-poly(2-(dimethylamino)ethyl methacrylate) (PEG-PDMAEMA) was synthesized by Atom Transfer Radical Polymerization (ATRP). The diblock copolymers were characterized with a rheometer to determine viscosity, or the deformation of a liquid in response to an applied stress. Smart polymer viscosity is expected to substantially increase when approaching its cloud point temperature. Different ratios of the smart polymer solutions were tested to understand how the viscosities differ as a function of shear rate under different temperatures and pH. Knowing how viscosity of PEG-PDMAEMA responds to changes in temperature and pH, the polymer can then be adjusted to a specific environment so it can be used in different applications such as enhanced oil recovery.

**Filament Damage in Bi$_2$Sr$_2$CaCu$_2$O$_{8-\delta}$ (Bi-2212) Superconducting Wires Exposed by External Etching**

*Jordan Egner-Schnitzler, Alexandra Putney*

Faculty Mentors/Collaborators: *Matthew Jewell, Christopher Hopp*  

Poster #: 95

Recent increases in the critical current density of Bi$_2$Sr$_2$CaCu$_2$O$_{8-\delta}$ (Bi-2212) composite wires have driven interest in superconducting magnet applications for this material. However, the round wire is comprised of brittle filaments in a soft silver matrix, leaving the wire susceptible to filament damage during operation. In this study, Bi-2212 wires were exposed to a chemical etch and then imaged to analyze filament damage. The damage effects were characterized as a function of geometry (flat, concave, and convex wire surfaces), mechanical test condition (tensile or compressive applied strain), and heat treatment condition (1 bar to 100 bar over-pressure processing). Scanning electron microscopy (SEM) was utilized to analyze the filament damage in each sample after the sample had undergone an external chemical etch process. In general, convex surfaces had large amounts and various types of damage compared to the concave surfaces. New results collected will compare damage effects relevant to mechanical conditions. This new understanding will allow for better modeling of the wire’s mechanical performance and influence coil design choices.

**Post-Delamination Structural Investigation of REBCO Superconducting Tape**

*Tanner Olson, Kasey Berger*

Faculty Mentors/Collaborators: *Matthew Jewell, Christopher Hopp*  

Poster #: 86

Rare-earth cuprate-based (REBCO) superconductors are a family of high-field, high-temperature superconductors fabricated in a tape geometry. The tape structure is composed of a nickel-based Hastelloy substrate base, with oxide buffer layers and a superconducting film. The composite is finished with a silver cap layer and a Cu stabilizing layer. One limitation of REBCO tapes in superconducting magnets is the possibility of transverse delamination within the tape; however, the microstructural features that control this delamination behavior are not fully understood. For this study we have developed sample preparation methods (and subsequent imaging by SEM and laser confocal microscopy) to quantify the damage modes present in delaminated samples. Specifically, we investigated the morphology of the delaminated surface and the retained layers on the tape to ascertain the nature of the crack initiation and propagation. Ultimately, a more thorough understanding of the delamination behavior of this material may lead to improvements in future processing to minimize this effect.
The Role of Sample Preparation Techniques in Assessing Mechanical Damage in YBCO Superconducting Tapes  
Kasey Berger, Tanner Olson  
Faculty Mentors/Collaborators: Matthew Jewell, Christopher Hopp  
Poster #: 96

Yttrium Barium Copper Oxide, or YBCO, is a high temperature superconductor that, in a magnet, can produce magnetic fields greater than 25 Tesla. It has a tape-like geometry rather than a wire form. Copper and silver encase the tape, and a nickel-based substrate is used for strength. The actual superconductor, as well as a set of buffer layers that help align the crystal structure orientation within the superconducting layer, sit between the copper and silver casing and the substrate. High amounts of internal stress can cause these layers to delaminate, hindering the electrical properties of the tape. The aim of this research is to understand how various sample preparation techniques (including slitting and metallographic polishing) impact the delamination tendencies of YBCO. By revealing the superconducting layer through a sequence of etchants, damage can be introduced in a controlled way and analyzed by scanning electron microscopy and laser confocal microscopy. Analysis has shown crack propagation depth prompted by shearing (from the slitting process) to be consistent. It has also been observed that the copper and silver casing play some role in crack propagation tendencies. This will continue to be explored through further research along with a chemical etching replacement to conventional edge-shearing methods.

Synthesis, Characterization, and Interfacial Tension Testing of PEG-b-PDMAEMA  
Elizabeth Laskowski, Megan Hottmann, Kendra Berry  
Faculty Mentor/Collaborator: Elizabeth Glogowski  
Poster #: 128

“Smart” polymers change properties in response to an external stimulus and have a wide range of applications from tissue engineering to optical data storage. The smart polymer poly(2-dimethylaminoethyl methacrylate) (PDMAEMA) changes solubility in response to both pH and temperature. When covalently bonded with poly(ethylene glycol) (PEG) to form a diblock copolymer, the PEG-b-PDMAEMA structure can be changed to control the “smart” polymer properties. PEG-b-PDMAEMA was synthesized using Atom Transfer Radical Polymerization to control polymer block ratios. Polymer structure was confirmed using Nuclear Magnetic Resonance Spectroscopy and Gel Permeation Chromatography. The cloud point, or the temperature at which the smart polymer switches solubility in water, was measured using UV-Vis Spectroscopy. To further understand the change in properties, Pendant Drop Tensiometry was performed to measure the interfacial tension between aqueous polymer solutions and toluene. The PEG-b-PDMAEMA diblocks with controlled molecular weights were tested at different pH, buffer concentrations, polymer concentrations, and temperatures. It is necessary to test interfacial activity of polymers in a broad range of conditions to determine the potential of PEG-b-PDMAEMA diblock copolymers for use in applications such as enhanced oil recovery and wastewater treatment.

Synthesis of Smart Polymer-Grafted Silica and Confocal Microscopy  
Nathan Pinter, Maria Brandel  
Faculty Mentor/Collaborator: Elizabeth Glogowski  
Poster #: 114

Smart polymers are long chains of repeating subunits that have altering characteristics when exposed to a change in external stimuli such as temperature and pH. Colloids are small, non-dissolved particles suspended in a liquid; their properties depend on size and chemical composition. The goal of this project is to synthesize and characterize smart polymer-grafted colloidal silica particles in order to better understand and tune the smart characteristics and properties. Possible applications include 3-D printing and enhanced
Poster Presentations: Natural and Physical Science

**Physics and Astronomy**

*Comparing the Properties of a Semiconductor Diode Laser to a HeNe Laser in the Optics Lab Context*

Luke Jarocki  
Faculty Mentor/Collaborator: Nathan Miller  
Poster #: 134

In this project, we compare the properties of Helium-Neon (HeNe) lasers and semiconducting diode lasers. HeNe lasers have traditionally been used in the educational optics laboratory, but we wanted to explore how well the less-expensive semiconductor diode lasers would work in this context. We begin with a review of the theoretical properties of lasers and the specific laser emission mechanisms of the two lasers under study. To determine if the alternative type of laser would be suitable, we performed the existing optics labs with the diode laser to see if it would give comparable results to the HeNe. The diode laser output wavelength was between 610-660 nanometers, which is similar to the HeNe’s wavelength of 632.8 nm. We explored the wavelength stability, beam intensity, and intensity distribution of the two lasers. We conclude with a discussion of the utility of the diode lasers in the educational laboratory.

*Investigation of a Ninth Planet*

Alexander Kukay  
Faculty Mentor/Collaborator: Paul Thomas  
Poster #: 233

A number of Trans Neptunian Objects (TNOs) within the Kuiper Belt exhibit unusual orbital characteristics that remain unexplained by the current model of the solar system. The orbits of these objects are highly inclined and eccentric, which suggests an external gravitational influence. A possible explanation for this phenomenon is perturbation by a larger, anti--aligned planet that remains to be directly detected. Evidence of this interaction can be gathered by analyzing long term progressions of orbital characteristics of these smaller bodies through computational simulations. Orbital characteristics of this undetected theoretical body can be determined by using different initial conditions and calculating interactions between the proposed planet and the population of TNOs. We present preliminary modeling results which suggest configurations that are most probable and confine the possible location in space for such a planet.

*Numerical Modeling of Bipolarons and Electron-Hole Pairs in Organic Magnetoconductance*

Michael McDonnell  
Faculty Mentor/Collaborator: Paul Thomas  
Poster #: 234

Carbon-based, organic semiconducting devices are a relatively new form of semiconducting material that have several key advantages over their conventional silicon-based counterparts. Notably, organic
semiconductors can be used in the construction of flexible LED displays and thin-film transistors which, in some characteristics, outperform silicon-based transistors. Under certain experimental parameters, like an external magnetic field, the behavior of organic semiconductors remains difficult to predict. We present early results of a numerical simulation model of the motion of electron and holes (electron vacancies) in the conduction band of an organic semiconductor immersed in an external magnetic field of varying strength. This work is in support of the experimental research of Dr. James Rybicki, and will be tested by comparison with his laboratory results. In addition, the model will be used to determine the temperature dependence of this magnetic field response, before the experimental work is performed.

**Research and Development of a Polycarbonate Solar Water Heater**

Hunter Hermes, Brendan Kwick, Sawyer Buck, Li Jin
Faculty Mentor/Collaborator: Kim Pierson
Poster #: 137

This project will evaluate the performance of a new flat plate solar water heater panel design. Our design utilizes low cost materials while being theoretically three times more efficient than current solar water heater systems. Flat plate solar water heaters are usually attached to the roof of a building and sunlight heats water that is then pumped into a building to use for domestic hot water. Given the unique performance characteristics of our panel design, we are proposing a new application for heating building air that involves the use of a ground source heat pump system. Our solar water panel would replace the ground loop that is normally used in these systems. Rather than gathering thermal energy from the ground, the solar water panel gathers energy directly from the sun. Our application and panel design looks to provide large volumes of warm water which reduces energy loss compared to standard systems which produce smaller volumes of hot water. The focus of this project is to minimize construction cost and maximize efficiency in hopes to make renewable energy more obtainable for the average consumer.

**Role of Bipolaron Mechanism and Electron-hole Pair Formation in Organic Magnetoresistance**

Luogen Xu
Faculty Mentor/Collaborator: James Rybicki
Poster #: 135

As personal electronic devices become smaller in size, organic electronic devices become more appealing due to their mechanical flexibility, ease of fabrication, ability to make them thinner and more light-weight than conventional devices. With this growing interest comes the need to understand the operational physics of these devices. One of the unanswered questions is the mechanism behind the large room temperature magnetococonductance these devices display. As a magnetic field is introduced into the region of the organic device, the amount of current flowing through the organic layer changes, indicating a change in the material’s conductance. In this research project, a mathematical model was created to describe this phenomenon. It postulates that the magnetococonductance is related to two distinct processes: the formation of bipolarons and the formation electron-hole pair. This research will focus on how the spin of the charge carriers is impacted by the introduction of a magnetic fields and ultimately leads to a change in the amount of current flowing through the device.

**Self-Navigating Field Programmable Gate Array Robot**

Marissa Zaleski, Rebecca Tollakson
Faculty Mentor/Collaborator: Kim Pierson
Poster #: 136

The purpose of this research is to design a self-navigating robot that can perform at a higher speed than the current configuration. We accomplished this by using a new kind of computer chip called a field programmable gate array (FPGA). The advantage of the FPGA is faster operation because the computer
control code runs on hardware gates within the FPGA instead of as lines of code on a central processing unit in a regular computer. In addition the control algorithm can be designed to operate as a large number of parallel independent loops which further increases the speed of operation. We also incorporated a new distance sensor design, which allows the sensor to scan twice as fast as the current configuration. All these enhancements allow the robot to drive at maximum speed through an obstacle filled environment.

Watershed Institute

Campus Greenhouse Gas Emissions Inventory
Ryan Frank, Lauren Graves, Megan McHenry, Nicholas Reitano
Faculty Mentors/Collaborators: Karen Mumford, James Boulter

Since signing the American College and University President’s Climate Commitment in 2007, the University of Wisconsin Eau Claire has completed five Greenhouse Gas Emission (GGE) inventories. All inventories were completed by students enrolled in an Honors course entitled Tracking the Campus Carbon Footprint. This student-centered approach is unique because students contribute critical leadership in the development of all GGE inventories and policies to reduced campus emissions. For all five GHG inventories, students collected and reviewed data from a variety of sources, such as electricity and natural gas receipts, natural gas and coal usage by the university heating plant, mileage for domestic and international travel and survey data about travel from home to campus. Greenhouse gas emissions were then calculated for four major sectors: electricity, heating plant, waste, and transportation. Inventory results indicate that heating plant and electricity emissions have declined due to fuel switching from coal to natural gas. Transportation-related emissions have increased primarily due to increased travel for domestic and international immersion experiences. By presenting both current and historic data, we highlight measurable reductions by sector and areas where additional efforts are needed. This presentation concludes with recommendations to inform the development of a Campus Climate Action Plan.

Energy Use and Greenhouse Gas Emissions among University of Wisconsin System Campus Buildings
Saffron O’Brien, Breanna Coerber, Andrea Hunger, Sierra Joswick, Rory Smuhl
Faculty Mentor/Collaborator: Karen Mumford

Portfolio Manager, an energy assessment tool developed by the United States Environmental Protection Agency, was used to assess energy use and carbon emissions in university buildings within the University of Wisconsin System. Little information is available on the variability of usage among specific buildings across the campuses. During the summer of 2016, energy use data were collected for 105 buildings across five system campuses: Eau Claire, Lacrosse, Oshkosh, River Falls, and Whitewater. Electrical, natural gas, and steam usage data were analyzed for a 12-month period from July 2014 to June 2015 across academic buildings (n=52), residence halls (n=48), and student centers (n=5). Using Portfolio Manager, we generated energy use intensity (EUI) and greenhouse gas emissions (GHG) values for each building. Kruskall-Wallis one-way analysis of variance (ANOVA) was used to assess whether significant differences occurred among energy and emissions measures based on campus location, year of construction, and building type. Although there were no significant differences among buildings by campus, there were significant differences based on building type and year of construction. These results suggest that similar interventions across all campuses may be effective for improving energy efficiency tailored to building type and era of construction.
Perceptions of Walkability in an Eau Claire Neighborhood
Logan Bergevin, Josie Myers
Faculty Mentor/Collaborator: Karen Mumford
Poster #: 8

Residents who live in walkable neighborhoods are more likely to engage in higher levels of walking, report lower safety concerns, and experience higher levels of social engagement compared to those living in less walkable neighborhoods (Mason et al., 2013; Talen and Koschinsky, 2014). Although objective measures of the physical characteristics of walkable neighborhoods are important (e.g. street connectivity, walkable destinations, building density etc.), resident perceptions of neighborhood settings are equally important. These perceptions highlight the feelings and experiences of residents have in their neighborhoods. In fall 2016, we conducted household surveys in a neighborhood in Eau Claire, WI to explore resident perceptions of neighborhood walkability and safety. We used the shortened version of the Neighborhood Environment Walkability Scale (NEWS) instrument, a well-validated walkability perceptions survey. Of the 110 residents that we contacted, over 58% participated in the survey. Preliminary results suggest that residents perceive their neighborhood to be relatively walkable. Most residents felt they lived within walking distance to a number of destinations and that their neighborhood maintained sidewalks and other physical features that supported walking. Findings from this study will assist in the identification of strategies to improve walkability and health and inform efforts to support healthy neighborhood developments.

Social Sciences

Accounting and Finance
Incidence of Corporate Fraud and Its Influence on Shaping Economic Policy and Government Spending
Anika Reinighaus
Faculty Mentor/Collaborator: DeeAnne Peterson-Meyer
Poster #: 97

The purpose of this study is to determine whether corporate fraud has a direct effect on United States economic policy and government spending. Looking at the big picture (2000 – 2015) and choosing specific, isolated events to analyze will help determine the causes of certain changes in economic policy and government spending over the relevant range. Understanding this relationship is key in determining whether economic policies geared towards fraud prevention are effective in (a) retroactively compensating for a major economic change caused by fraudulent activities, (b) detecting incidents of fraud, and (c) preventing potential future fraud.

Communication and Journalism

"Autonomy is the Name of the Game:" Montessori Methods [AND] Socioemotional Development
Jenna Jandrt
Faculty Mentor/Collaborator: Nicole Schultz
Poster #: 57
Current literature regarding Montessori methods surrounds academic success in a variety of disciplines, but little suggests that students attending a Montessori school develop differently in regards to socioemotional development. The purpose of this research is to investigate in which ways Montessori schools are uniquely designed and implemented in an intentional way to foster socioemotional development of students. The five philosophical tenets of socioemotional development that this particular research explored are conflict reconciliation, autonomy, leadership, diversity, and empathy. The implications of this research are applicable to parents with young children, teachers, policy makers, and professionals working in academic settings in that it may have strong potential to position them to better understand pedagogical practices that best serve a child's socioemotional development. Data was collected through interviews with Montessori teachers surrounding the five tenets. Convenience sampling was used and data was analyzed using thematic analysis and grounded theory. Results are contextualized utilizing the Ecological Systems Theory modified by Urie Bronfenbrenner in 1977. This particular theory claims that in order to understand the individual, one must examine the environment in which the individual functions including the home, workplace, community, and culture.

**Boys Can Cry: The Influence of Parenting Style on Role Congruity and Emotional Intelligence**

Caitlin Miller  
Faculty Mentor/Collaborator: Kristine Knutson  
Poster #: 69

In discussing emotion and gender roles, anger is discussed as one of the only socially acceptable emotions for men to display (Wood, 1995). Knowing this, the current study aims to understand how perceived parenting style received (i.e., emotion coaching (EC), or emotion dismissing (ED)) mediates conformity to role congruity in a sample of undergraduate students from the University of Wisconsin-Eau Claire. The study utilizes Emotion Regulation Theory (Cupach & Olson, 2006), Role Congruity Theory (Motro & Ellis, 2017) and Emotional Intelligence (EI) (Williams, Daley, Burnside, & Hammond-Rowley, 2009). The researchers expect that males will report lower levels of EC parenting than females. Furthermore, parenting style will mediate sex and conformity to role congruity inasmuch that ED parenting will lead to higher role conformity for males and lower role conformity for females, whereas EC parenting will lead to higher role conformity for males and lower role conformity for females. This study may benefit the communication literature because it could offer insights into how gender plays a role in parenting styles utilized, as well as the lasting effects that parenting styles may have on individuals as they move into early adulthood in terms of gender roles and emotional intelligence.

**Clicks vs. Facts: The Media’s Role in Political Information and How Emotional and Behavioral Political Involvement Are Associated with Perceived Bias**

Allison Wilson, Danielle Koenig, Katelyn Perry, Matthew Zavoral, Madeline Shaw, Jillian Manion  
Faculty Mentor/Collaborator: Martha Fay  
Poster #: 65

There is a direct relationship between consumer trust in media and level of involvement with an issue (Vallone, Ross & Lepper, 1985); research has shown that people who are involved in a group or issue are highly knowledgeable on the topic and will therefore scrutinize information that disagrees with their opinion (Gunther, 1992). Political issues in particular may evoke intense emotion and lead to this kind of close scrutinization. Intense emotion may impact a person's willingness to seek further information on an issue and/or their latitude of acceptance, rejection, and non-commitment of a particular media account. This effect may be exacerbated by findings showing that political party affiliation is associated with perception of media bias, with those on the left discrediting right-leaning media and vice versa (Kaye &
Johnson, 2016). Social judgment theory (Sherif & Hovland, 1961) suggests that one’s beliefs are aligned with viewpoint polarization and may impact perception of media bias. Further, this study will examine whether perceptions of media bias and credibility moderate the relationship between behavioral and emotional involvement. Students at a Midwestern liberal arts college were surveyed to determine whether their level of involvement with political issues is associated with information seeking and viewpoint polarization.

**Coding Brands on Twitter: How are Message Choice and Interactivity Associated with Consumers’ Brand Loyalty?**  
Bethany Vinson, Katie Ahrens, Megan Cousineau, Anne Olson, Kathleen Ahrens  
Faculty Mentor/Collaborator: Martha Fay  
Poster #: 54

Prior research shows that companies who exhibit perceptions of expense (putting time and effort into communicating with their consumers), and high levels of caring (about consumers’ well-being) through the use of dialogue with consumers on Twitter, fulfill the needs and desires of their consumers; this in turn, increases brand loyalty, brand attitudes, and purchase intention among consumers (Collander, Dahlen, & Modig, 2015). While use of social media to connect with consumers has been studied, little is known about the content of those messages and how it correlates with brand loyalty. Our research aims to identify how brands use Twitter to create and strengthen brand loyalty through the use of interactivity and strategic messages. In order to do this, we will analyze what types of language and communication stimulate brand loyalty on Twitter. This study codes tweets of two competitive brands over a two-week period, using categories based on three variables typically associated with employee identification: needing, belonging, and mattering (Masterson & Stamper, 2003). Results of the study should increase understanding of the role that message choice may have in building consumer brand loyalty and will test this framework in a different context.

**Family Influence on Medical Decision Making**  
Ashley Boley, Mikala Hayes, Taylor Hoffman  
Faculty Mentor/Collaborator: Kristine Knutson  
Poster #: 52

Our study aims to investigate family influence on college-aged individuals’ medical decision making. We believe that the way someone was raised can affect the decisions they make even when they are no longer in the same household as the family members who previously influenced these decisions. This study is important because for many college students, this is the first time in their lives they have the responsibility to make important decisions on their own; the choices made can set the tone for the degree of autonomy individuals will have in future decision making. In addition, we also wanted to further investigate factors that can influence these decisions (e.g. quality of relations with family members, how often an individual is in communication with their family, etc). Based on personal experiences, combined with review of previous literature, we hypothesize that college-aged individuals will make the same or similar decisions as the ones that were made in the household they were raised in. To collect anonymous data, we constructed and distributed an online survey to our target demographic and asked them questions about their beliefs and behaviors in regard to specific medical decisions (e.g., flu shot, annual check-ups, etc.).

**First Generation College Students and Familial Communication**  
Sydney Tupy, Katherine Forsha, Stephanie Kuski, Samantha Theodore  
Faculty Mentor/Collaborator: Kristine Knutson  
Poster #: 68
The purpose of this study is to investigate first generation college students’ (FGCS’) perceptions of family communication before and during the transition to college. The study surveyed first-generation undergraduates, identifying key family communication styles as well as how students adapt to their college environment. Using relational dialectics as the framework for this research, we examined how situational experiences amongst FGCS’ vary, how their experiences become an integral component in their daily lives and how this eventually transfers to their family communication dynamic. This study highlights the interactions of FGCS’ with their families as they compartmentalize their learned styles of academic communication. Students at the University of Wisconsin-Eau Claire were surveyed through snowball sampling, which examined their relationship satisfaction with their family, tensions in communication style with family, the socioeconomic status of students’ family, how relationships affect academic performance and if students perceive a difference in communication style prior to postsecondary education compared to after.

**Hmong Women in Higher Education: Analyzing Empowerment, Patriarchy and Family, and Student-Teacher Interaction**  
Barbara Vue, Pang Kou Yang, Vajfue Lee  
Faculty Mentor/Collaborator: Martha Fay  
Poster #: 66

Despite the increase in women entering higher education world-wide, there is still a low representation of women in the “higher level” of education (Chanana, 2012). In particular, student women of color within academia are confronted with obstacles that other women are not. This may impact their performance in college (Marbley, 2011); for example, Hmong women have been shown to lag behind other Asian women in educational and economic attainment (Yang, 2014). One factor shown to enhance student success and empowerment is student-teacher interactions. However, there are no studies showing connections between empowerment of Hmong women and their interactions with teachers. This is especially important because Hmong women have been heavily discouraged by cultural and gender norms, yet they continue to strive to complete a higher education (Moua, 2002) enabling empowerment through independence and social status. Gender and cultural norms stem from patriarchy, which is defined as male dominance within a system (Ngampornchai, 2003). Through focus groups with Hmong women at a Midwestern university, we will examine empowerment in higher education, emphasizing teacher-student interactions and family roles in the Hmong patriarchal culture.

**The Role of Family Communication and Young Adult Decision-Making: Who Influences Whom?**  
Elizabeth Miniatt, Mikayla Stone, Sarah Engstrom, Elizabeth Jungquist, Krista Von Feldt  
Faculty Mentors/Collaborators: Martha Fay, Kristine Knutson  
Poster #: 53

Family communication has long been associated with young adult decision-making (Bakir, Rose, & Shoham, 2006). Baumbach, Forward, & Hart (2006) found that frequent, open, honest communication between parents and children is a significant predictor of parental influence on young adult decision making. Sullivan & Sullivan (1980) found that when children leave home there is an increase in open communication between parents and children. However, what is not known is how these relationships may change as young adults spend more time away from their parents. This study examines the association between family communication and young adult decision making with regard to when particular decisions are made and personal ideologies solidified. Research into the social learning and intergenerational transmission theories assume that the direction of influence is parent to child (Bakir, Rose, & Shoham, 2006; Badescu, Hooghe & Quintelier, 2007), and much of the research reflects this;
using a questionnaire with college students at various levels, this study will also examine whether young adults influence their parents through their communication about ideologies as they spend more time away from home.

**Student Leaders’ Source of Social Support and Its Association with Their Identification in a University Setting**
Michelle Miller, Katelyn Larson, Nicole Anderson, Meghan Hosely, Michaela Mandel, Erin Bosman
Faculty Mentor/Collaborator: Martha Fay
Poster #: 55

Basing our research on Social Identity Theory, (Ashforth and Mael, 1989) which states that people tend to classify themselves and each others into various social categories such as organizational membership, etc. Through previous studies, work-based social support has been shown to result in a stronger organizational identification (Wiesenfeld, 2001). Social support (SS) studies have tended to focus on subordinate support as received from their supervisors (Czech & Forward, 2010). In addition, organizational identification studies have primarily focused on the organization as the primary source of employee identification. As a result, other sources of social support and organizational identification are under studied. For example, students employed as leaders of university residence halls (Resident Assistants) may represent a population for whom these studies do not apply. Resident Assistants (RAs) identify simultaneously as students, employees, supervisors and administrators, and are likely to receive social support from a variety of vertical and horizontal relationships, which may alter the usual source of organizational identification. This qualitative research study examines how various sources of social support may be associated with sources of identification other than the employing organization. Using interviews with RAs at a Midwestern University, this study examines the frequency and type of SS received from various sources and its association of this support on their source of identification.

**Supervisor Nonverbal Behavior and Employee Satisfaction and Motivation**
Sarah Girard, Jessica Elley, Joshua McHenry, Jack Delahunt
Faculty Mentor/Collaborator: Martha Fay
Poster #: 67

Communication researchers have established that when leaders use positive nonverbal behaviors, it increases followers’ perceptions of the leader’s competence (Teven, 2007; 2010). Studies show that leaders are perceived to be more transformational if they are open, which is displayed through extroversion, approachability, trust, and reciprocity and interpersonal interactions (Norton, 1978). While these variables seem intuitively related to nonverbal communication, studies have not explicitly examined supervisors’ nonverbal behaviors and follower perceptions of their own motivation and satisfaction. Using a Qualtrics survey of college students, this study asked participants to answer questions about how nonverbal interactions with their supervisors influence the employee. Results should provide insight on employees’ motivation and satisfaction based on their supervisor’s nonverbal behavior, and can be used to inform supervisors in ways to improve their employees’ performance.

**Economics**

**Designing and Implementing a Successful Elementary School Vegetable Snack Program**
Jared Fogarty, Isabel Chmielewska, Shinhoo Park
Faculty Mentor/Collaborator: Eric Jamelske
Poster #: 99
Poor nutrition among American children, including low fruit/vegetable intake have contributed to rising rates of childhood obesity persisting into adulthood. Thus, increasing children’s fruit/vegetable intake has become an important focus among practitioners, policymakers and researchers. Additionally, prior research indicates children eat more fruits than vegetables making increased vegetable consumption a priority. We partnered with one local elementary school to implement a vegetable snack program. This presentation outlines our motivation and describes the planning/study design and objectives/procedures for measurement/analysis. Study participants include students (N=218) and teachers (N=12) in grades K-3. Children were served grape tomatoes, baby carrots and green pepper strips eight times each over 24 days. Pre and post weights were recorded to calculate individual consumption for each child on each snack day. One classroom from each grade was assigned to a unique intervention condition (no encouragement, encouragement and encouragement plus) for the first six servings of each vegetable. All classrooms were assigned to the no encouragement condition for the final two servings of each vegetable. From past experiences we know that planning and setting up the design and outlining roles, duties and responsibilities of all participants is extremely important to generating meaningful data for analysis.

Examining the Impact of Repeated Exposure and Encouragement on Consumption of Vegetables in an Elementary School Vegetable Snack Program

Joshua Bodnar, Kjirstin Martell, Matthew Pergolski
Faculty Mentor/Collaborator: Eric Jamelske
Poster #: 98

Despite evidence that increased fruit/vegetable consumption reduces the risk of many chronic diseases, low consumption among children persists. Given the health and social consequences/costs of children’s low fruit/vegetable intake, it is important to identify successful means of increasing children’s consumption. This is especially true for vegetables because of their low sugar and caloric content. We partnered with one local elementary school to implement a vegetable snack program. Students (N=218) and teachers (N=12) in grades K-3 were served grape tomatoes, baby carrots and green pepper strips eight times each over 24 days. One classroom from each grade was assigned to a unique intervention condition (no encouragement, encouragement and encouragement plus) for the first six servings of each vegetable. No encouragement was given for the final two servings of each vegetable. This presentation provides both graphical and statistical comparisons of vegetable consumption across intervention conditions. Results indicate consistent and significantly higher consumption of all three vegetables for encouragement plus and encouragement classrooms compared to no encouragement. Additionally, we find suggestive evidence of sustained higher consumption after all encouragement activities ended, especially for students in the encouragement plus condition. Lastly, Tomatoes and peppers were significantly less popular than carrots among all groups.

Gender Discrimination in the Labor Market

Levi Soborowicz
Faculty Mentor/Collaborator: David Schaffer
Poster #: 3

Explaining and proving the causes behind the gender wage gap in the United States labor market. We consider several alternative explanations, the first being the time flexibility hypothesis by Claudia Goldin, which asserts that women voluntarily choose jobs with lower pay, but more time flexibility, because of their home care responsibilities. If producers can create ways for part time work to be as productive per hour as full time work then the wage gap would disappear. Alternatively the wage gap could be explained by various forms of gender discrimination, the two most discussed involve either women being paid less for the same job as men, or women being crowded into “women’s occupations” that pay less. We used
large data sets from the U.S. Census Bureau for the years 2003 to 2015 in order to examine these alternative ideas. Our results via quantile regression analysis and use of principle components suggest that the time flexibility hypothesis does not explain more than a small part of the gender wage gap.

**The Impact of Assimilation and Acculturation on the Economic Progress of Hmong Americans**

Jennifer Lacroix, Yer Lor  
Faculty Mentor/Collaborator: Wayne Carroll  
Poster #: 83

Hmong refugees first arrived in the US forty years ago and since then, Hmong Americans have had significant economic progress, marked by increases in incomes, educational attainment, occupational status, ownership of homes and businesses, and numerous other measures. However, disaggregated data shows that “Hmong Americans are less likely than the average American to have a household income over $50,000, be employed, or be a college graduate” (Vaghul & Eldagan, 2016). Though assimilation and acculturation occurs and impacts economic progress of Hmong Americans, aggregated data of Asian American and Pacific Islander can be putting people at risk to being underserved. This project uses a huge database, including detailed Census data on 37,000 Hmong Americans from 1990 to 2014, to describe the changing distribution of economic characteristics of Hmong Americans over time, between generations, and between men and women. Our results document the considerable economic progress of first-generation Hmong Americans, as well as obstacles that slowed their progress, such as low levels of English fluency, education, and job skills. We also describe the more rapid progress of the “1.5” generation, who arrived in the U.S. as children, and succeeding generations who have been born in the U.S. We highlight evidence showing that many Hmong Americans are holding on to traditions, such as the use of the Hmong language in the home.

**The Impact of Water Clarity on Home Prices in Northwest Wisconsin**

Irene Ng  
Faculty Mentor/Collaborator: Thomas Kemp  
Poster #: 81

This study estimates the property value gains associated with improvements in water clarity on 20 Northern Wisconsin lakes. Using a two stage hedonic model applied to Wisconsin DNR water studies and sales data on over 300 homes obtained from Zillow.com we estimate that a 3 foot improvement in water clarity would produce a 9 - 16% improvement in the market price of an average property on lakes with the lowest clarity. On Lake Chetac (The focus of the study) we estimate a an additional 3 feet of water clarity would bring a 10 – 11% improvement in the value of the average property adjacent to the lake. This translates to an increase market value to $269,400 from $243,477 on the average property and an additional $10.4 million in total property valuation.

**Using Regression Analysis to Analyze Individual and Group Consumption Effects from an Elementary School Vegetable Snack Program**

Selena Scheller, Levi Soborowicz  
Faculty Mentor/Collaborator: Eric Jamelske  
Poster #: 82

Increasing children’s fruit/vegetable consumption is an important focus among practitioners, policymakers and researchers. Understanding what factors may influence children to consume more fruits/vegetables is very important. This is especially true for vegetables as children tend to eat more fruits than vegetables and vegetables are low in sugar/caloric content. Students (N=218) and teachers (N=12) in grades K-3 in one local elementary school were served grape tomatoes, baby carrots and green pepper strips eight times each over 24 days through a vegetable snack program. One classroom from each grade
was assigned to a unique intervention condition (no encouragement, encouragement and encouragement plus) for the first six servings of each vegetable. No encouragement was given for the final two servings of each vegetable. This presentation uses regression analysis to examine group/individual influences on vegetable consumption. Findings from graphical/statistical comparisons are robust to the more rigorous regression analysis. We find consumption for the first serving of all three vegetables was significantly influenced by encouragement condition. Moreover, we also find evidence that consumption for the first serving of all three vegetables was the primary determinant of consumption for later servings. Boys also tended to eat less vegetables compared to girls, especially tomatoes.

Economics, Watershed Institute, and Communication and Journalism

**Developing a Scoring and Group Classification System of Acceptance/Knowledge of Climate Change Realities for Citizens in the United States, China, and Vietnam**

Hunter Hermes, Ryan Hammer, Austin Holmes
Faculty Mentors/Collaborators: Eric Jamelske, James Boulter, Won Jang  Poster #: 100

With mounting scientific evidence regarding the realities of climate change including causes and consequences, the international/global importance of this issue cannot be overstated. Significant research has assessed public climate change views in developed countries including the United States and Europe. However, much less is known about public climate change views in developing countries. Surveys were conducted of American (4,927), Chinese (2,629) and Vietnamese (1,496) citizens in 2015-16 to provide comparisons of how citizens in developed/developing countries view climate change. We develop a scoring/group classification system based on responses to survey questions. This process yields an easily understandable metric for comparing acceptance/knowledge of basic climate change realities across citizens in these three countries. Overall, our results show significantly greater acceptance/knowledge of climate change realities for citizens in Vietnam and China compared to the United States. Vietnamese citizens have the highest knowledge/acceptance scores largely driven by higher concern and greater understanding of the scientific consensus on anthropogenic climate change. Additionally, we find significantly more variation in American climate change acceptance/knowledge compared to both Chinese and Vietnamese citizens. Lastly, political ideology in the United States is also related to acceptance/knowledge scores with conservatives having lower scores.

**Further Insights into Public Views on Climate Change in China and the United States: Evidence from a Topic Prevalence Analysis of Open-Ended Survey Question Responses**

Dylan Wilson, Tung Nguyen, Anastasia Rauland
Faculty Mentors/Collaborators: Eric Jamelske, James Boulter, Won Jang  Poster #: 101

Given the scientific consensus on climate change causes/consequences, global action to address this issue is paramount. China and the United States, as the world’s largest economies and greenhouse gas polluters, share prominent roles in the development/implementation of future international climate change mitigation strategies. However, public views regarding climate change are diverse/complex and can be uninformed/misinformed. To better understand climate change views in these two important countries we use survey data collected in the United States (N= 4,927) and China (N= 2,629) in 2015 analyzing responses to the question “what comes to mind when you hear the words ‘climate change’?” Our results show that both Chinese and American respondents frequently mention ice/glacier melt, sea rise, hot/warm, temperature, weather, pollution, natural, carbon dioxide and greenhouse gas/effect. Chinese
respondents were more likely to mention vehicles and industry, while Americans mentioned fossil fuels more. Additionally, US respondents had significant mentions of science and politics compared to no mentions in China. Neither country mentioned media/news with any frequency. Lastly, comments regarding if climate change is real/happening were only present among Americans. Further examination of the US data reveals that “naysayer” and “alarmist” comments were correspondingly isolated among respondents with low/high climate change acceptance/knowledge score respectively.

**Using Climate Change Acceptance/Knowledge Scores and Group Classifications to Assess Public Support for an International Climate Treaty and Willingness-to-Pay for Climate Change Mitigation in the United States, China, and Vietnam**

Ashley Pike, Kayla Coonen, Cora Cornett
Faculty Mentors/Collaborators: Eric Jamelske, James Boulter, Won Jang
Poster #: 80

Climate change is the most important environmental/societal issue facing our world today. Because of the global causes/consequences of climate change, international cooperation is essential in developing, implementing and financing successful mitigation policy action. Moreover, public support for action around the world will likely be a significant determining factor regarding if/when climate change mitigation policies will be enacted. Using survey data collected in the United States (4,927), China (2,629) and Vietnam (1,496) in 2015-16 we assess public support for an international climate treaty. Our results show significantly more support in Vietnam and China compared to the United States. Moreover, support for a treaty in all three countries declines significantly if it is known that either the United States and/or China will not sign/participate in the treaty. We also examine public willingness-to-pay costs associated with climate action. Our results show a significantly greater willingness-to-pay among Vietnamese and Chinese compared to Americans. We also find that acceptance/knowledge of climate change realities is positively correlated with support for an international treaty and willingness-to-pay mitigation costs in all three countries. Additionally, political ideology is a significant factor in the United States with conservatives showing less support for an international treaty and lower willingness-to-pay mitigation costs.

**Geography and Anthropology**

**How the 2nd Congressional District of Minnesota Was Won in the 2016 General Election**

Samuel Loftsgaarden
Faculty Mentor/Collaborator: Ryan Weichelt
Poster #: 170

The purpose of this research projects seeks to find the constituents and other outside factors that made the 2016 race for the 2nd Congressional District of Minnesota the closest contest in recent memory. This district was chosen for a variety of reasons. It was the first time since 2002 that incumbent John Kline (Republican) would not be running. The race was also impacted by independent Paula Overby, a transgender woman running on a progressive platform. Statistics were compiled using the U.S. Census and the Secretary of State for Minnesota’s respective websites. Demographic information was then compared with prior election results reaching back to 2012. ESRI ArcMap was used to map the data. Despite polling data suggesting a Democratic win, the Republicans retained the seat. However, the margin of victory was only 1.8% in contrast to the 2014 race’s 17.1% Republican victory. Results should
suggest that an increasingly diverse and educated 2nd District could create another opportunity for a progressive Democratic candidate to finally flip the district from red to blue in 2018.

**Is Tolerant Good Enough? Eau Claire and the Practice of Welcomingness**
**Carissa Dowden**
Faculty Mentor/Collaborator: **Paul Kaldjian**

Immigrants are a vital part of community success, and many groups, such as Welcoming America, are advocates of inclusive communities. This, along with growing attention to immigrant-friendly cities, lead to the question of whether or not Eau Claire should be considered a “welcoming” city. Our research team invited city council, school board and other community leaders in Eau Claire to an interview. Fourteen individuals accepted and were asked five questions about their perspectives and experiences on Eau Claire’s welcomingness. These results were compiled and analyzed. We found that a majority (67%) think Eau Claire is welcoming “to some extent,” suggesting city leaders are aware of problems, but are unsure how to tackle them. In addition, there were noticeably differing opinions as to what was a problem, suggesting a lack of consensus. Being welcoming is intentional and won’t happen by itself, so we recommend Eau Claire engages with organizations around the country like WelcomingAmerica.org, and draws from the experiences of other communities to create more opportunities for inclusivity.

**Libraries and Censorship: The Accessibility to Information in Wisconsin Public Library Systems**
**Seth Anderson-Lind, Annalyn Alt, Derek Fritz, Austin Kassner, Karin Knapp, Clare McCarty, Hillary Smith, Blake Wacholz**
Faculty Mentor/Collaborator: **Paul Kaldjian**

The purpose of this project is to look for spatial variations in the access to information using public library databases in the state of Wisconsin. Books with diverse content are often banned or challenged; the American Library Association (ALA) has been keeping track of bans or challenges against texts since 1990 as they pursue free access of knowledge. Wisconsin has close to 400 public libraries organized into 16 public library systems. We will cross-reference a selection of ALA’s commonly challenged books containing diverse content with Wisconsin library databases to see how such books are made available to the public. Once the information is gathered, we will organize the data spatially, such as in a map, in the search for patterns that suggest censorship. This research would shed light on the issue of censorship as well as allow for reflection within Wisconsin on statewide stances with information and knowledge being accessible to all.

**Memorializing a Massacre: Placemaking and Accessibility at the Sand Creek Massacre National Historic Site**
**Allison Lenzmeier**
Faculty Mentor/Collaborator: **Ezra Zeitler**

On the dawn of November 29, 1864, Colorado volunteer soldiers attacked a peaceful Cheyenne and Arapaho encampment at Sand Creek, resulting in nearly 200 deaths. The Sand Creek Massacre is memorialized by the Sand Creek Massacre National Historic Site under the jurisdiction of the National Park Service. Drawing on work on memorials and commemoration in cultural geography (Alderman 2000, Carlson and John 2015), this research investigates how the Sand Creek Massacre has been remembered in the landscape of eastern Colorado. Through a case study of the memorialization process resulting in the establishment of the Sand Creek Massacre National Historic Site in 2007, the concepts of
placemaking and accessibility are used to frame the contentious negotiations between Indigenous and non-Indigenous stakeholders involved in the development of the federally-operated site and the resonance of the Sand Creek Massacre in public memory.

**Non-Resident Land Ownership in Northern Wisconsin: An Analysis of Sun Belt Resident Property Values and Their Second Home Values in the Northwoods**

Hannah Wirth
Faculty Mentor/Collaborator: Ezra Zeitler
Poster #: 221

Northern Wisconsin’s lakes and forests have been important tourism amenities for many decades, and while many visitors camp or rent accommodation during their visit, thousands own second homes (i.e. cabins). Many of these property owners reside in the Northwoods during Wisconsin’s warm summer months but list their primary residence in the Sun Belt, where they spend the rest of the year. As little is available in academic literature about the geographies of second home ownership in Wisconsin, the purpose of this study is to analyze the values of the primary residences of Sun Belt residents with their seasonal residences in northern Wisconsin in order to determine the value of an owner’s Northwoods property in proportion to the value of their primary residence. To address this research question, parcel data sets were obtained from the Wisconsin State Cartographer’s Office and county assessors websites in the Sun Belt and analyzed with a geographic information system (GIS). Results reveal the complex histories of land tenure and strong identities that non-residents have for the Northwoods.

**Rural Outmigration and Community Sustainability**

Katelyn Zuelsdorff
Faculty Mentor/Collaborator: Paul Kaldjian
Poster #: 187

The rising departure of young people from rural places is a growing concern for many regions across the nation. Without their community participation, rural America will continue to struggle. The goal of this research is to provide a voice to young people to find out which of them are leaving, why they are leaving, and what can be done to attract them back. A survey was given to all students at UWEC from Buffalo and Trempealeau Counties, WI to learn from their experiences. The response rate was over 40%. A comparison of county demographics showed that Buffalo and Trempealeau County vary in many factors such as poverty level and population. Despite the differences, about two-thirds of respondents plan not to return to their home counties. Survey respondents gave a wide range of reasons for leaving, including a lack of specific jobs and activity development, and offered suggestions for retaining and attracting young people. Rural places might take these suggestions into consideration if they want to prevent their further loss of their young population.

**Management and Marketing**

**Employee Workplace Behaviors and Attitudes**

Megan Tragiai
Faculty Mentors/Collaborators: Rebecca Wyland, Gabi Eissa
Poster #: 236

The purpose of this research is to examine the relationship between employee workplace attitudes and behaviors by further investigating the role of organizational commitment and job satisfaction on job performance. This study is especially interesting because it follows a period of high turnover and budget cuts in a university setting, which addresses research gaps. Data will be collected from approximately 30 participants within a university college, in a one-step anonymous survey process. Participants include
both full time and part time faculty and staff within a university college. The results of our study will be analyzed through correlational and multi-regression analyses. Implications for both theory and practice as well as study limitations will be discussed.

Management and Marketing and Business Communication

**Autism in the Workplace: An Investigation of Germany and the United States**  
Johannah Erffmeyer, Melanie Bauer, Garrett Doubleday  
Faculty Mentors/Collaborators: Nancy Hanson-Rasmussen, Paula Lentz  
Poster #: 235

This IFP research project investigates initiatives that target hiring individuals with Autism Spectrum Disorder (ASD) in Germany. Organizations are beginning to realize some of the strengths that people with ASD can bring to the workforce (example, attention to detail). Germany is the leader in vocational programs of people with ASD and personal meetings with professionals provided insight to the success of their programs. Via in person interviews, Johannah Erffmeyer, Melanie Bauer, and Garrett Doubleday investigated the initiatives and the perceptions of employees and employers of a variety of companies in both the US and Germany to gain an understanding the potential of individuals with ASD as successful members in the workforce. Our results indicate a great deal of personal support yet concerns regarding implementation. This project was unique because we were able to explore the perceptions of German and United States managers, employees, and agencies and their perspectives on whether initiatives in training and hiring individuals with autism can be a competitive advantage. Therefore, our research questions are: what benefits and challenges are realized by training and hiring workers diagnosed with autism and are initiatives in training and hiring individuals on the autism spectrum a competitive advantage for employers?

Political Science

**Continued Development of a Taxonomy of Clergy Sexual Grooming: Results from One Benedictine Abbey**  
Allison Mignon, Alexander Langer  
Faculty Mentor/Collaborator: Jason Spraitz  
Poster #: 25

This research focuses on sexual grooming behaviors used by clergy accused of sexual abuse of minors. Sexual grooming comprises a series of strategies that would-be abusers use to create trust with their victims, thus building a relationship in order to lower inhibitions and eventually victimize their targets. For this study, we conducted a retrospective content analysis of publicly available files of monks from one Benedictine Abbey in Minnesota who have been credibly accused of sexual abuse of minors. The files of 18 monks were read and all instances of grooming were identified. Findings of our analysis suggest that accused monks from this abbey used any of eight specific grooming tactics in order to build relationships with their victims and eventually abuse them; these findings support similar research that was conducted last year examining priests in one Illinois diocese. This further supports the creation of a taxonomy of clergy sexual grooming. In addition, we discuss the direction future research should take in assessing and further developing this new taxonomy.
**Does Environmental Design Matter? Fear of Crime and Victimization Reduction on College Campuses**  
Haley Alger  
Faculty Mentor/Collaborator: Ming-Li Hsieh  
Poster #: 35

Given that several active shooters events have occurred on campus in recent years, campus security has became a great concern within higher education institutions. To maintain and provide a safe learning environment for faculty and students is one of the primary responsibilities of schools. The doctrine of Crime Prevention Through Environmental Design has been applied to improve quality of life and fear of crime and incident reduction. Hence, this study aims to explore the relationship between students’ perception of safety and exterior site features on college campuses. Through a systematic literate review approach, this study found that students who perceived positive environmental design such as bright lighting at night, visibility of assistance phone systems and emergency blue call boxes, CCTV installation and police presence would feel safe. However, when in areas with negative physical characteristics including lack of prospects, refuge and escape, these spots provoked perceptions of fear and students would feel vulnerable of exposure to risk of victimization. The study concluded that higher education institutions might be able to stop fear, lower victimization, reduce blind spots of hiding offenders and prevent incidents through proactive environmental designs.

**Do You Feel Safe? Fear of Crime and Victimization on College Campuses**  
Angelina Mort  
Faculty Mentor/Collaborator: Ming-Li Hsieh  
Poster #: 36

Over the past twenty years, there has been a substantial increase in school shootings and violent attacks on campuses across the United States. Widespread media coverage underlines the concern for campus safety with respect to fear of crime and victimization. Hence, this study aims to explore students’ perceptions of campus safety and identify factors that may affect their attitudes toward the issues in this regard. The systematic review of current literature on this topic focuses on features such as demographics and past experiences that may impact students' fear of crime. Results indicated that demographic characteristics, such as gender, age, race, and weapon possession are associated with students' perceived fear of crime. Moreover, those students who experienced direct or vicarious victimization perceived a higher risk of victimization and expressed higher levels of feeling unsafe. Interestingly, students' perception regarding campus safety and the degree of risk of being victimized was also affected by major or area of study.

**Gender and Caste in India: Marginalization of Dalit Women**  
Aimee Gillespie  
Faculty Mentor/Collaborator: Stephen Hill  
Poster #: 28

This presentation is based on a seminar course I attended in New Delhi in January 2017, facilitated by the Miranda House College and the Indian Institute of Dalit Studies (IIDS). It aims to examine the social hierarchy of caste in India, and the role it plays in the oppression of Dalit women. Dalit people belong to India’s lowest caste, characterized by extreme poverty and social exclusion. While the caste system has been officially outlawed, it remains an omnipresent force in Indian society. Indian Dalit women face acute discrimination and marginalization due to the intersection of their caste and gender identities. According to IIDS, women belonging to this caste live under 5 P’s: Patriarchy, Productive resource access inadequacy, Poverty, Promotion advancement insufficiency, and Powerlessness. With these forces
in mind, this presentation will examine issues specific to Dalit women in the areas of violence, caste conflict, access to education, and reproductive health.

**The Imperial Presidency**  
**Richard Dean**  
Faculty Mentor/Collaborator: *Stephen Hill*  
Poster #: 34

This study examines the expansion of Executive war powers during the Obama Administration. Through an analysis of the Administration’s use of force decisions, including those on drone strikes, Yemen and Libya, it will assess whether President Obama further enhanced the ‘Imperial Presidency’. It will conclude with a discussion of the implications of the Obama Administration’s actions on the powers of the new Trump Administration.

**Prevalence Rates of Politically Charged Bullying among College Students following the Election of 2016**  
**Madison Bacon**  
Faculty Mentor/Collaborator: *Justin Patchin*  
Poster #: 27

The polarization of United States politics gained significant attention during the 2016 election cycle. Technological advancements have allowed people a new medium to express their political frustrations; however, the academic research on politically charged cyberbullying is scarce. The purpose of this project was to evaluate the prevalence of and motivations behind traditional and cyberbullying among students at the University of Wisconsin - Eau Claire in the months following the 2016 election of Donald Trump. Data for this study was collected from the responses of a random sample of college students to an online questionnaire focusing on both traditional and cyberbullying. Respondents who indicated they had been victims of either traditional or cyberbullying were additionally asked if they were targeted specifically for their race, gender identity, sexual orientation, or political ideology. We hypothesize that politically charged bullying will exist throughout the political spectrum, however we cannot yet predict to what extent. It is our hope that this project may inspire further research on the topic of politically charged bullying during this particularly divided period of American history.

**Textbooks and .22’s: Support for Carrying Concealed Weapons on College Campuses**  
**Brady Seidlitz**  
Faculty Mentor/Collaborator: *Ming-Li Hsieh*  
Poster #: 26

Given the recent proliferation of firearm related violence on American campuses, many states have responded to this issue by passing new legislations about carrying concealed firearms. For example, in Wisconsin individuals with a valid concealed weapon permit are allowed to carry firearms on campus and in Texas they’re also allowed to carry in campus buildings. This study aims to discuss a debate over whether or not states should allow individuals to carry concealed weapons on campus and/or in university buildings. To explore this question, the current study examines students and faculty attitudes toward carrying weapons on campus through a systematic literature review approach. Findings discovered that overall both students and faculty members were strongly opposed to allowing concealed weapons on campus across states. They expressed an increased sense of fear and feeling unsafe while attending schools where legislators pass laws permitting students and faculty to carry concealed weapons on campus.
Psychology

Age of Onset as a Risk Factor in Non-Suicidal Self-Injury
Nensi Xhunga, Krista Carter, Sophia Hipke, Katherine Dussl, Brady Gustafson, Bram Faledas, Jacob Ottersen
Faculty Mentor/Collaborator: Jennifer Muehlenkamp Poster #: 46

Non-suicidal self-injury (NSSI) is most likely to emerge during early adolescence, although some report a later age of onset. An earlier age of onset may reflect lower protective factors and lead to increased severity, but few studies have examined this possibility. The current study tested the hypothesis that participants who began NSSI prior to, or at, age 14 would report more severe NSSI and fewer protective factors than those who began NSSI at age 15 or older. Participants included 518 college students with a history of NSSI who were recruited to complete an online survey assessing NSSI, subjective happiness, resilience, and life satisfaction. Independent sample t-tests comparing the younger and older age of onset groups showed significant differences on the number of NSSI methods (t = 4.94, p < .01) and lifetime frequency (t = 4.53, p < .01). Post-hoc analyses were conducted among participants reporting current NSSI (n = 179). Similar results were observed, with an additional difference between groups on life satisfaction (t = 2.77, p < .01). These findings support research suggesting an earlier age of onset is associated with more severe NSSI, and add to the literature suggesting that lower life satisfaction may be related to earlier age of onset.

Assessing In-Kennel Behavior of Dogs as a Predictor of Length of Shelter Stay
Adam Moline, Allyson Salzer, Eric Markham, Kylie Legate, Sarah Hudson, Janel Balsavich, Hannah Marose, Jacqueline Gaerber, Madison Bacon
Faculty Mentor/Collaborator: Carla Lagorio Poster #: 79

Approximately 1.2 million dogs admitted into animal shelters are euthanized annually. Many animal welfare organizations have been advocating for the use of behavior modification programs to not only improve canine behavior while living at the shelter but ideally to increase adoptability and long-term placement potential. However, few studies have investigated what types of behavioral traits or skills to best focus on for improved chances of adoption. The current study records in-kennel behaviors of adoptable dogs as they are greeted by new people, in an attempt to correlate this with length of stay at the shelter. Dogs are observed weekly during their shelter stay and researchers code for up to 40 behaviors they could exhibit. Researchers will examine whether in-kennel behaviors change over time, and whether any particular behaviors correlate with length of shelter stay. Based on the findings, we will ideally be able to devise more targeted training plans to reduce undesirable behaviors and increase behaviors found to be desirable to potential adopters through positive-based training methods.

Assessing the Reliability of Several Brief Delay Discounting Procedures in Rodents
Janel Balsavich, Eric Markham, Allyson Salzer
Faculty Mentor/Collaborator: Carla Lagorio Poster #: 41

Delay discounting describes how the value of a commodity is affected by how quickly it is delivered, and is measured by examining how long an individual will wait for a larger but more delayed outcome. Given its correlation with clinical impulsivity, it is a process that has been widely studied over the past 30 years. One main concern is that collecting discounting data with previously developed approaches is time-consuming. The current research compares the reliability of several delay discounting methods, including
a commonly utilized one-month program and two methodological variants developed out of our lab that have potential to generate discounting curves in one or two weeks. Groups of rats were exposed to the three procedures in counterbalanced order, and points of subjective equality were calculated to assess indifference points between one food pellet available immediately and two, four, or eight pellets delivered after different delays. Results indicate that our novel procedures produced systematic data across the manipulations, providing support that these new methods may produce better and more rapid discounting curves than other commonly used procedures. This can be important for researchers studying how impulsivity is related to time-sensitive variables such as periods of adolescence or pharmacological manipulations.

**Discrimination Depicting Disrespect**

Nicholas Walkowiak, Austin Van Cleave  
Faculty Mentor/Collaborator: Blaine Peden  

This poster describes whether students and staff on the University of Wisconsin-Eau Claire campus show subtle discrimination toward the LGBTQIA+ community. We systematically observed campus community members passing by either The Bridge, an LGBTQIA+ resource center, or the Math Lab. We measured glancing and avoiding behavior with subtle discrimination defined by differential prolonged glancing and veering away from the lounge. Glancing was coded three ways: (a) Looking straight ahead, (b) quickly glancing toward the center, or (c) prolonged staring into the resource center. We defined active avoidance three ways: (a) continuing their normal walking past, (b) drifting away, or (c) veering away from the resource center. Our results showed disproportionately prolonged glancing toward the Bridge compared to the Math Lab resource center. There was also disproportional drifting and veering away from the Bridge, but not the Math Center. We conclude that the University of Wisconsin-Eau Claire staff and students shows subtle discrimination toward the minority community that identifies with the LGBTQIA+ label. This is a behavioral counterpart to the campus climate survey, and our findings are consistent with the results from the survey.

**Discriminative Stimulus Effects of Naltrexone and Haloperidol in Rats with Chronic, Intermittent Access to Sucrose Solutions**

Morgan Marek, Adam Moline, Damin Hadorn-Papke, Jenna Vogelsang, Matthew Cyra, Michelle Wallner, Justin Todd, Simon Moe, Rachel Eichstadt, Kimberly James, Luke Altendorf  
Faculty Mentor/Collaborator: David Jewett  

Daily, but limited, access to sugar results in “binging” in rats. The excessive sugar intake has been reported to increase dopamine and endorphin function in the brain. We wondered if sucrose access altered the discriminative stimulus effects of haloperidol and naltrexone. Rats were given 12-hr access to sucrose solutions and given daily injections. One group received alternating injections of naltrexone – an endorphin antagonist – or saline; the other group was given alternating injections of haloperidol – a dopamine antagonist – and a vehicle solution. Training occurred in two-choice operant chambers with condition-appropriate lever presses reinforced with sugar pellets, and continued until subjects exhibited 80% or more condition-appropriate responses for 8/10 consecutive sessions. Naltrexone (3.2 mg/kg) was established as a discriminative stimulus in most subjects (~72 sessions). Haloperidol (0.056mg/kg) was established as a discriminative stimulus in 4 of 4 subjects with chronic, intermittent sucrose access (~49 sessions) and 5 of 6 subjects with 24hr water access (~82 sessions). Subjects who failed to acquire the discrimination by showed no discriminative behavior by ~120 sessions. We found slower acquisition rates than rates O’Donnell found (1989), subjects without sucrose consumption acquired the haloperidol.
discrimination in 45 sessions. Consistent with O’Donnell, haloperidol significantly reduced rates of lever pressing.

**Doesn’t She Feel the Same? Discrepant Levels of Attraction Between Opposite-Sex Friends**

Laiken Peterson, Ronald Lockington, Rachel Griffiths, Jacob Harriman  
Faculty Mentor/Collaborator: April Bleske-Rechek  
Poster #: 16

In studies of heterosexual adults’ opposite-sex friendships, men report more attraction to their opposite sex friends than women do. The current study aims to determine whether men and women are aware of their friend’s discrepant level of romantic attraction toward them. As part of a broader study of male-female dyads, researchers observed 98 male-female pairs sitting in a lounging area, and recorded their independent judgments of the dyad’s relationship status and each dyad member’s level of romantic attraction to the other person. Then, researchers approached the dyad and interviewed each member about their actual relationship status, romantic attraction to their partner, and perception of their partner’s romantic attraction to them. Of the dyads, 53 were just friends. On average, men reported more attraction toward their female friend than the women did toward them. Within dyads, men’s and women’s attraction levels were not correlated. Neither men nor women seem to be aware of the discrepancy in their attraction levels; men perceived their female friends to be more attracted to them than the women actually were, and women perceived their male friends to be less attracted to them than the men actually were. We discuss directions for future research involving non-heterosexual dyads.

**Do Researchers in Psychology Practice What They Preach? Unjustified Cause-and-Effect Language in Peer-Reviewed Journal Articles**

Jenna Maly, Michaela Gunseor  
Faculty Mentor/Collaborator: April Bleske-Rechek  
Poster #: 17

People conflate correlation with causation. The bias has been described as a mindware gap (Stanovich, 2009) that “leads us astray practically every day” (Dobelli, 2013, p. 110). One culprit might be widespread use of unjustified cause-and-effect language in the media (Resnick, 2016), but even researchers have been criticized for using inappropriate causal statements in their journal articles and press releases (Robinson et al., 2007; Sumner, 2014; Woloshin et al., 2009). Indeed, when we reviewed posters presented at the 2015 convention of the Association for Psychological Science (APS), over half of the poster submissions that contained cause-and-effect language were unjustified in their use (Bleske-Rechek et al., under review). However, APS does not have a rigorous poster review process. Therefore, in the current study, we are investigating the use of unjustified cause-and-effect language in peer-reviewed, published journal articles. We selected seven psychology journals, from different sub-disciplines, with medium impact factors (e.g., Journal of Youth and Adolescence, Social Psychology Quarterly). We have established inter-rater reliability for incidence of cause-and-effect language and status of that language as justified or unjustified (Kappas = .88-1.0). We are currently coding 210 articles and will present our findings on the percent of articles that contain unjustified cause-and-effect language.

**Drink that Joe: When is a Good Time for Coffee?**

Rebekah Damitz, Christopher Acton, Emily Schulz  
Faculty Mentor/Collaborator: Blaine Peden  
Poster #: 109

This naturalistic observation study determined whether (a) working individuals frequent coffee shops more than others, and (b) if time of day influences who frequents coffee shops. Our participants were a convenience sample of individuals who entered two selected coffee shops during specified time frames.
Demographic information was collected on estimated age (four to sixty-two years of age) and sex (male or female). Working individuals were identified by a work uniform, name tag, or professional clothing (e.g., dress slacks, blazers, buttoned/collared shirts/blouses, or a dress). The study found a significant relationship between appearance and time of day with a small effect size. There was no significant relationship between sex and frequency with a medium effect size. These results can be generalized to the surrounding population in the Eau Claire area. Implications for this study include a necessity for future research into the relationship between sex, coffee consumption, and professional dress, topics little researched.

**Athletics Influence on Eating Disorders in the College Demographic**

Kelsey Kronholm, Madeline Mitchell, Jillian Homa, Whitney Wendorf, Alexes Hennen

Faculty Mentor/Collaborator: Jarrod Hines

Poster #: 73

The current study examined the role of social pressures on college athletes’ degree of conformity to norms related to body type and the thin-as-beautiful aesthetic. We analyzed behaviors associated with disordered eating as well as external factors that may influence one’s self-image. One hundred fifty-two collegiate athletes (aged 18 to 27 years; 116 females, 36 males) completed an anonymous online survey consisting of questions related to their self-esteem, commitment to a sport, and the degree of influence that their coaching staff and teammates have on their overall performance, beliefs, and eating behaviors. Results indicated that one-third of the participants are dissatisfied with their bodies, particularly the size of their stomach and thighs. In the collegiate environment, peer groups and extracurriculars may be associated with hidden predictors of eating disorders. Our results indicate external and internal pressures to the athletes shown by the fact that 45% of responders chose to agree with the statement “other people have expected excellence out of me.” Raising awareness that eating disorders are prevalent within athletics is beneficial for the athletes involved, peers, and particularly the coaches who may not realize their athletes may be affected.

**Effects of the Environment and Deprivation Condition in Aged Rats Trained to Discriminate between 22- and 2-hr Food Deprivation**

Jenna Vogelsang, Matthew Cyra, Michelle Wallner, Rachel Eichstadt, Simon Moe, Justin Todd

Faculty Mentor/Collaborator: David Jewett

Poster #: 74

We wondered if the effects of pre-test food consumption or exposure to the environment where food consumption occurred would have any effect on 2 and 22 hr hunger discrimination. We trained rats (aged 2-2.5 years old) to discriminate via a choice paradigm, and rats acquired the discrimination (mean acquisition 71 sessions). Following a pretest session where rats emitted condition-appropriate responding (left lever presses after 22 hr deprivation, right lever presses after 2 hr deprivation), rats were placed in a cage for 2-20 minutes with or without food. Rats were tested again where responses on either lever were reinforced during the 30 minute session. Under 22 hr deprivation conditions, responses following the 2-20-minute exposure periods (with or without food) was similar (food consumption and access to the cage resulted in a decrease in deprivation-appropriate responding.) Under 2 hr deprivation, responding was consistently appropriate independent of condition, indicating the reduction in 22-hr responding is not due to a general deficit performance. Results suggest discrimination test performance in the food deprivation paradigm may be affected by experimental history and other learned factors.
**Electrophysiology of Error Processing: Motivational and Affective Correlates**
Ronald Lockington, Sarah Loew, Simon Moe, A'lea Yonker, Samuel Becker, Lucas Brandt, Kelsey Rolefson
Faculty Mentor/Collaborator: David Leland  
Poster #: 76

Trait anxiety is positively correlated with amplitude of the error-related negativity (ERN), a brain electrical response to errors (Hajcak & Foti, 2008). In a separate study, we conducted a survey showing positive correlations between measures of anxiety, fear of failure, depression, and clinical perfectionism. The current study uses electroencephalography to investigate the relationship between these measures and amplitude of the ERN, as well as the error positivity (Pe), during a flanker task. In the flanker task, participants make responses indicating the direction of a central curly brace in a series of five curly braces. So far, our preliminary results replicate classic findings for both brain responses in that they were larger following incorrect behavioral responses than correct responses. Our goal is to determine how motivational and/or affective factors relate to the electrophysiology of error processing.

**Evaluating the Effects of a Six-Session Book Study on Educators’ Mindfulness Practices**
Michelle Stanek
Faculty Mentor/Collaborator: Marie Crothers  
Poster #: 13

Mindfulness-based practices have become increasingly visible in schools in recent years. Research shows that mindfulness interventions may benefit students (e.g., Schonert et al., 2015). Little research has been conducted regarding educators’ experiences with, and perceptions of mindfulness, before implementation, though it is possible that these factors may partially predict the success of interventions. This pilot study explored a possible way to increase educators’ own, personal mindfulness practices, as well as to increase their perceptions of the acceptability of mindfulness strategies, through the format of a book study. The participants were elementary educators who volunteered to participate in the study group. Eight participants completed the pretest, and seven completed the posttest. Educators’ perceptions of their own mindfulness were assessed at pretest and posttest (using the Teacher Mindfulness in the Classroom Scale, the Toronto Mindfulness Scale, and the Five Facet Mindfulness Questionnaire). Perceived acceptability and effectiveness of a mindfulness intervention for a hypothetical student with behavioral concerns were also measured at pretest and posttest (using the Behavior Intervention Rating Scale). Analyses showed that educators’ ratings of the acceptability and effectiveness of the hypothetical mindfulness-based intervention increased, while their personal, self-reported mindfulness scores did not change significantly.

**Exploring College Students’ Perceptions of Overparenting and Levels of Self-Compassion**
Casey Hoffman, Danielle Rockwell, Nicholas Peterson, Samuel Schwiebert
Faculty Mentor/Collaborator: Mary Beth Leibham  
Poster #: 133

The purpose of this study is to expand our Spring 2016 study in which we explored the links among self-compassion, anxiety, perfectionism, and achievement goals by including overparenting as a potential correlate of these variables. Overparenting is the term used to refer to developmentally inappropriate levels of parent involvement. While parent involvement has been linked to many positive young adult outcomes (e.g., autonomy, positive peer relations), recent research has highlighted potential negative outcomes (e.g., maladaptive perfectionism, anxiety) of overparenting (Rosseau & Scharf, 2015; Segrin et al., 2012). Using an online survey, we will explore the links between overparenting and various factors underlying college students’ well-being such as self-compassion, academic anxiety, perfectionism, and
achievement goals. We hypothesize that overparenting will be inversely related to self-compassion, and positively related to perfectionism and academic anxiety. We also predict that overparenting will be associated with achievement goals, with students who report higher levels of overparenting being more likely to endorse performance goals. This study has the potential to inform the higher education community about the prevalence of overparenting among college-aged students. This study will also provide information on various factors that underlie college students’ well-being, namely self-compassion, perfectionism, academic anxiety, and achievement goals.

**Fueling for the Day: Nutritional Perceptions and Behaviors of College Students**
Elysia Boles, Matthew Cooper
Faculty Mentor/Collaborator: Blaine Peden
Poster #: 108

A two-factor, within-subjects design study assessed the nutritional habits of college students. The study assessed how gender and food scenarios relate to a participant’s perception of healthy eating and eating frequency. This research aids in the understanding of college student’s nutritional habits, and how these habits impact general health. The study was generated and distributed to participants via Qualtrics, an online survey program. Random assignment apportioned participants to one of two scenario groups that viewed four meal conditions with either male or female characters. This study utilized a two-way analysis of variance, with a significance level of p < .05. Researchers found that scenarios with male subjects had significantly higher perceived scores than females. Researchers also, found that the frequency for meals related to healthy conditions compared to unhealthy conditions was significantly higher. This study is unique in that it contributes to understanding healthy eating behavior, as well as perceived healthy eating behavior.

**Getting Down to the Details in a Long-Term Mate: Traits that All People Prioritize… and Traits that Only Some People Prioritize**
Morgan Marek, Casey Hoffman
Faculty Mentor/Collaborator: April Bleske-Rechek
Poster #: 19

People around the world prioritize love, kindness, and faithfulness in a long-term mate (Buss, 2003). People also prioritize similarity, as evidenced by data showing that couples are similar to one another in physical, cognitive, and psychological characteristics (Luo & Klohnen, 2005). Finally, humans also prioritize familiarity, as evidenced by data showing that people select mates whose physical characteristics resemble those of their caregivers (Bereczkei et al., 2004; Heffernan & Fraley, 2013). But how much of mating is random (Lykken & Tellegen, 1993), and how much can be systematically tied to individuals’ family and rearing environments? In the current study, we test the hypothesis that family members hold similar mate preferences and attitudes, whether it be through shared rearing experiences, shared genetic dispositions, or both. In our study, each young adult participant and a close family member (parent, sibling, or both) will complete measures of (1) their feelings and behavior patterns in romantic relationships (the Trent Relationship Scales Questionnaire; Scharfe, 2016) and (2) the degree to which they prioritize various characteristics in a long-term mate. At CERCA we will likely report only on original participants’ relationship styles and preferences, unless we have already managed to secure their family members’ responses.
Hovering Questions: Are Healing Touch and Therapeutic Touch Evidence-Based Practices?
Ronald Lockington, Katie Paulich
Faculty Mentor/Collaborator: April Bleske-Rechek
Poster #: 18

Americans’ use of complementary and alternative medicines is on the rise (Little, 2013). Two popular interventions are Therapeutic Touch and Healing Touch, both of which are based on the premise that illness reflects an imbalance in the patient’s energy field (Fazzino et al., 2010). Although human energy fields are not measurable or detectable (Rosa et al., 1998), energy therapies reportedly involve the adjustment and balancing of patients’ energy fields via the flow of healing energy through the practitioner’s hands, not via actual touch (Krieger, 1979, 1993). These alternative therapies are taught to student nurses nationwide as a form of holistic healing. However, multiple reviews of the literature have concluded that research that claims to support the validity of these interventions is fraught with methodological errors, such as small samples, lack of appropriate placebo control, and subjective rather than objective outcome measures (Anderson & Taylor, 2011; Peters, 1999). Because of the growing interest in these energy therapies and the use of resources in the UW-Eau Claire nursing program to teach them, we conducted a review of more recently published research (2010-2016) to determine if the quality of the studies has improved. It has not.

How Does Stimulus Difficulty Impact Study Time Allocation in Younger Adults?
Emily Onken
Faculty Mentor/Collaborator: Jarrod Hines
Poster #: 72

There are many contexts in which people are allowed multiple opportunities to study new information prior to a test. It is important to understand how people allocate restudy efforts to enhance learning efficiency. Prior research used homogeneous sets of word pairings (of similar difficulty), but the current research will use a mixture of easy-, moderate-, and difficult-to-remember pairings to determine the degree to which possible memory confidence cues (below) are reactive to stimulus difficulty. Participants will study a set of word pairs (e.g., DOG-SPOON), take a memory test, and repeat this process a second time. We expect to find relationships between item-specific restudy time and (1) a person’s memory of their past test performance (a recollection of getting an answer correct or incorrect previously); (2) participants’ impressions of item difficulty following an initial study attempt; (3) objective memory accuracy during an initial test (prior to restudy); (4) subjective memory test confidence; (5) objective response times to test stimuli; and (6) subjective response time estimates (i.e., how fast they think they responded to test questions). The relative weighting of cues is expected to differ based upon the ease of learning each word pair.

How Do Traditional and Non-Traditional Students at UW-Eau Claire View School Policies Related to Class Performance?
Karin Knapp, Samantha Korn
Faculty Mentor/Collaborator: Jarrod Hines
Poster #: 48

The current study will investigate the degree to which students and instructors agree with university-wide and classroom-specific policies at the University of Wisconsin-Eau Claire. Student and teacher attitudes toward policy fairness will be assessed using an anonymous online survey. Research participants will include current students and instructors, with the student group being categorized as either traditional or nontraditional based upon their self-perception and the university policy definition. Policies are hypothesized to differentially impact traditional and nontraditional students and therefore may be rated
differently based upon group membership. We will examine attitudes toward policies associated with, e.g., attendance, class-specific D2L incorporation, and the amount of weight given to online and in-class assessments. We expect to find that nontraditional students are more dissatisfied with policies than traditional students, although instructors may rate the impact of policies similarly regardless of student classification. Finally, we anticipate an incongruence between students’ perceptions of the nontraditional classification and the official definition as provided by university policy. It is our hope that this information might be used to enhance the degree to which students’ life circumstances are considered when constructing policies that impact them.

**Impact of an Undergraduate Honors Course in Suicide Prevention**  
**Sophia Thoen**  
Faculty Mentor/Collaborator: *Jennifer Muehlenkamp*  
Poster #: 103

Due to the lack of literature on the effect of an undergraduate course on suicide prevention, the aim of the current project was to evaluate the short- and long-term impact of an undergraduate Honors course on student’s knowledge of suicide, characterization of individuals who attempt suicide, stigma towards suicide, and willingness to advocate for suicide prevention in the community. Participants completed a pre-test survey prior to the start of the semester, a post-test survey assessing the same constructs at the end of the semester, and at a three-month follow-up. Repeated measure ANCOVAs with prior suicide prevention training as the covariate were performed on the data. Results showed that students who took the suicide prevention course endorsed more time and willingness to advocate for suicide prevention in the community, and had significant gains in objective knowledge about suicide, compared to controls. Offering an undergraduate course in suicide prevention appears to be feasible and could increase broader student interest in suicide prevention advocacy by increasing the number of individuals who carry this knowledge, into their future as community members and professionals; leading to increased advocacy of suicide prevention in society.

**Implementation Models for Interteaching**  
**Rachel Helgeson, Ashley Tucker**  
Faculty Mentors/Collaborators: *Lori Bica, Catya von Karolyi*  
Poster #: 104

We present an overview of the behavioral teaching method known as interteaching and discuss evidence documenting its effectiveness in enhancing engagement and learning. Interteaching can be used in face-to-face or online courses in any discipline, and with students of various ages/ability levels. The typical interteaching approach in a face-to-face class involves the instructor first distributing a preparation guide they developed for the purpose of guiding students through content they will cover during the next class. In the next class session, students form small groups to discuss preparation guide questions. While engaged in discussion, the instructor rotates among groups to facilitate discussion and support student comprehension. Students then determine which questions were difficult, as well as any other information to assist the instructor in gauging student learning. The instructor uses this feedback to develop a clarifying lecture for the next class. Research literature indicates interteaching – with its active learning and social reinforcement features, and the direct connection between study and test materials – results in better understanding and retention of course content than traditional forms of instruction (Saville, Zinn, & Elliott, 2005). We present ideas for different in-person and online implementation models, including how instructors can use technology to facilitate interteach activities.
“It’s Your Turn…Whether You Want to or Not”: Men’s and Women’s Household Task Distribution Preferences
Caitlin Richmond, Laiken Peterson, Michaela Gunseor
Faculty Mentor/Collaborator: April Bleske-Rechek

Studies suggest that the division of household labor and childcare, even in dual-earner households, is imbalanced (Bianchi et al., 2000; Milkie et al., 2002). For example, even among tenure-track faculty with small children, fathers report engaging in far less childcare than mothers do (Rhoads & Rhoads, 2012). However, mothers also report more enjoyment from many childcare tasks than fathers do (Rhoads & Rhoads, 2012), which raises the possibility that gender differences in activity preferences may be linked to gender differences in task distributions. To investigate this possibility, we ask young men and women to report their (foreseen) enjoyment of various household and childcare tasks. College students are an ideal sample for measuring unrestricted preferences because they are immersed in a gender egalitarian environment and are unlikely to be constrained by long-term partnerships, children, and specific employment policies. To get a comprehensive picture of preferences, we provide a varied list of housework and childcare activities as well as often-neglected activities (e.g., lawn care, finances, scheduling, vehicle maintenance, etc.). We report the degree to which young men and women foresee liking or disliking each task, and how they would prefer, in an ideal household arrangement, to split each task with their partner.

Making APA Style Great Again!: Insights into Teaching and Learning APA Style
Caitlin Miller
Faculty Mentor/Collaborator: Blaine Peden

This poster regards APA style as an exemplar because it is the genre used by various academic disciplines. Psychology, Sociology, Nursing, Business, Communications, Criminology, and Linguistics instructors struggle to teach, and their students struggle to master APA style (Chism, & Weerakoon, 2012; Goddard 2003; Landrum 2013). Madigan, Johnson, and Linton (1995) suggest one reason for these struggles is that instructors have tacit knowledge of different dimensions of the style. Although documenting scholarly works distinguishes academic writing from everyday writing, learning to document in APA style is challenging because it entails extensive tacit knowledge. For example, students have to integrate the distinctly different skills of finding resources, citing the resources in a manuscript in the appropriate way, and referencing completely and correct in a list at the end of a paper. The current literature focuses on the “how” to cite, largely ignoring the “why” to cite. This poster focuses on how the why, when, and where to cite (and reference) approach will benefit both instructors and students. Although we focus on documenting, these insights from this one dimension of APA style may suggest remedies to other difficult aspects of teaching and learning APA style. This approach also informs teaching and learning other academic genres.

Perceptions of Manspreading as a Factor of Gender and Circumstance
Nensi Xhunga, Lane Coulter
Faculty Mentor/Collaborator: Blaine Peden

This study extends the researchers’ naturalistic observation study regarding the incidence and associations of manspreading on the Eau Claire bus system. Manspreading describes males on public transport sitting with their legs spread wide enough apart to encroach on other seats. In this study, researchers investigate public perception of the act by measuring participant’s inconvenience toward one of two manipulated images of manspreading. Male and female’s self-perceived compassion toward others was also measured.
to determine if compassion had an influence on their perception of the images. Responses were analyzed to see if gender or circumstance of manspreading had a main effect or interaction on inconvenience and compassion. Participants age ranged from 17 to 70 years old. A 2 x 2 between-subjects analysis of variance showed that gender and circumstance had a significant interaction on inconvenience. Females shown the image of manspreading in the direct-contact circumstance showed significantly higher inconvenience ratings than any other group. These results suggest that manspreading may warrant more public attention, such as public service advertisements recently added on New York City subway systems (Fitzsimmons, 2014). This study lends opportunities for further exploration in the field of social psychology, specifically group processes, psychological attitudes, and conceptions of self.

**Predictors of Clinical Perfectionism: Anxiety, Depression, and Fear of Failure**
Sarah Loew, Kelsey Rolefson, Ronald Lockington, A'lea Yonker, Simon Moe, Samuel Becker
Faculty Mentors/Collaborators: David Leland, Jeffrey Goodman

The purpose of this study was to demonstrate clinical perfectionism’s convergent validity. Clinical perfectionism can be defined as having a maladaptive critical self-evaluation based on excessively high standards. The Clinical Perfectionism Questionnaire (CPQ; Shafran et al., 2002) is designed for the diagnosis and treatment of clinical perfectionism. Previously, non-clinical measures of perfectionism have been shown to correlate with anxiety, depression, and fear of failure. A total of 300 undergraduate students completed our online survey, which includes the CPQ and measures of anxiety, depression, and fear of failure. We hypothesized, and results confirmed, that all three variables are positively associated with clinical perfectionism. Furthermore, a multiple regression analysis indicated that anxiety and fear of failure were significantly predictive of clinical perfectionism, but that depression did not explain any further variance. Our findings provide a conceptual replication of the key correlations with non-clinical perfectionism, extending them to and supporting the construct validity of clinical perfectionism. In addition, these findings contribute to our understanding of the relative importance of factors predictive of clinical perfectionism.

**Predictors of Mental Illness Stigma among College Students**
Megan Schilling
Faculty Mentor/Collaborator: Jeffrey Goodman

The purpose of this research is to evaluate a model of mental illness stigma that replicates and extends previous findings by including, in a single study, a comprehensive array of measures of mental illness stigma predictors identified by previous research. Participants completed an online survey in which they responded to various demographic (e.g., age, sex/gender) and educational items (e.g., year in school, coursework taken), measures of personal contact and familiarity with individuals with mental illness, and explicit measures of stigma and discrimination. In a future study, participants will complete three in-lab mental illness IATs (e.g., measures of implicit stigma). We hypothesized that one’s degree of familiarity and meaningful interpersonal contact (negative and positive) with individuals with mental illness would predict levels of both explicit and implicit bias, which in turn would predict discrimination toward individuals with mental illness. We further predicted that college students’ education level and coursework taken would predict levels of familiarity and meaningful interpersonal contact with mental illness individuals. Our findings hold promise to be the most comprehensive account of factors predicting mental illness stigma and discrimination to date. Furthermore, our findings may offer insights into the development of evidence-based interventions for reducing stigma against mental illness.
**The Real Test: Can College Students Reason about Evidence?**

Katie Paulich, Caitlin Richmond, Rachel Griffiths  
Faculty Mentor/Collaborator: April Bleske-Rechek

National data suggest that some students show growth in their critical reasoning skills over four years of college, but one third of students do not (Arum & Roksa, 2011). UWEC is no exception; in a study that followed students from their first year to fourth year of college, 37% showed no change or a decline in their overall scientific literacy (Bleske-Rechek & Donovan, 2015). These deficits in reasoning skills may have real world impact; students may be ill-prepared to evaluate the various claims they are exposed to on a daily basis. In the current study, we aim to investigate students’ responses to varied levels of evidence for products and remedies. We borrowed three existing products (Coconut Oil, MuscleTech, and Healing Touch Therapy), gave them new names (Javva Oil, PowerCore, and Radiant Energy Therapy), and designed four levels of evidence in support of each one: personal testimonial, product description, pre-post change without a placebo, and pre-post change with a placebo. Using a 3 (product) x 4 (level of evidence) between-subjects design, we will assess how convinced students are by varied levels of evidence, and the degree to which they use scientific reasoning to explain their response to the evidence presented.

**The Relationship Between Resilience and Time Spent Outdoors**

Michael Becker, Jack Ray  
Faculty Mentor/Collaborator: Marie Crothers

"Nature Deficit Disorder" is the phrase used by Louv (2010) to describe the behavioral and psychological costs of minimal contact with nature. Though this is not a formal clinical disorder, it raises important questions about the connection between exposure to the outdoors and mental health. A large body of research has explored resilience, which is defined as the ability to "persevere and adapt when things go awry" (Reivich & Shatté, 2002). This exploratory study aims to determine whether there is a relationship between the amount of time spent outdoors, and resilience – a link that has not been explored in any depth to date. Most studies link nature deficit to psychological pathology, whereas this study examines whether spending substantial time in nature may be related to psychological flourishing. Therefore, this study is among the first of its kind. Participants will be asked to complete an online survey containing two measures of resilience and questions about participants’ time spent outdoors. Data collection is not yet complete, but we hypothesize that participants who report spending more time outdoors will score higher on measures of resilience. This study may contribute to a new dimension of inquiry on the positive psychology construct of resilience.

**Rescuing the Overpouring Effect: The Impact of Perceived Drinking Situation on Fluid Poured in a Simulated Alcohol Free Pour Task**

Meredith Watson, Brianne Ackley, Lucas Duce, Amelia Schneider, Jack Fischer, Erin Brock  
Faculty Mentor/Collaborator: Douglas Matthews

It has been demonstrated that college students over pour a standard drink for themselves, termed the Overpouring Effect. However, if subjects are instructed to pour a standard drink for themselves and an unknown peer, the Overpouring effect is eliminated. To investigate if the Overpouring Effect could be reestablished in the presence of an unfamiliar peer, we had subjects pour a beer for themselves and an unfamiliar peer “as if they were attending an off campus party.” Subjects also completed the AUDIT and Barlett Impulsivity Scale along with a two-week follow back drinking report. AUDIT, number of days
drinking and the number of days binge drinking all positively and significantly intercorrelated. To investigate if situational instructions can reinstate the Overpouring Effect we analyzed the amount of fluid poured by subjects for themselves and for the unknown peer based on AUDIT score. The Overpouring Effect was re-established. Subjects with an elevated AUDIT score over pour significantly more than subjects with a low AUDIT score. These data demonstrate that situational instructions can re-establish the Overpouring Effect and that it is dependent on alcohol use history measured by AUDIT scores.

**A Review of Error-Correction Strategies**
Katelyn Hoffert, Samantha Boyle
Faculty Mentor/Collaborator: Kevin Klatt

A rich literature exists of procedures to effectively teach a variety of skills to people with typical and atypical development. Teaching skills using effective procedures, however, still sometimes results in learner errors. How a teacher should respond when an error occurs is not always clear. Four strategies exist to correct errors including: verbal feedback, modeling, delay, and remedial trials. These strategies have been used both in isolation and in a variety of combinations. To this point, no review has been conducted on the strategies. Given the importance of teaching skills to persons with intellectual disabilities, and the lack of a cohesive research review, the purpose of this study was to review and evaluate research pertaining to correcting errors when teaching skills. Past studies pertaining to error correction were investigated according to whether error correction strategies were used in isolation or in combination. Other variables recorded included participant characteristics, research designs, and how effectiveness and efficiency were measured. Overall conclusions and recommendations for future research are provided.

**The Role of Humor in Intimate Relationships**
Jack Ray, Michael Becker
Faculty Mentor/Collaborator: Marie Crothers

The present study investigates the link between similarity in sense of humor and overall relationship quality, as well as whether humor is a viable strategy for conflict resolution in romantic couples. Participants were couples attending UWEC. Both individuals in a relationship were asked to complete a measure of intimacy along with a humor styles questionnaire to determine whether relationship quality was correlated with similarity in humor styles between mates. We expected partners that resembled each other more in humor style to have higher relationship quality scores than couples with less similar humor styles. This would be in accordance with past research (Barelds & Barelds-Dijkstra, 2010; Cann, Zapata, & Davis, 2011). In addition, participants were asked to complete a conflict resolution measure, to determine whether humor is an effective method for resolution. We expected affiliative humor to be more conducive than aggressive humor for resolving conflict in intimate relationships. By examining these questions, we hope to demonstrate the function of humor in intimate relationships. This project is most relevant to literature in Social and Positive Psychology, as it takes a closer look at communication and interaction within relationships.

**Romantically Involved or Just Friends? Accuracy and Consensus in Judgments of Male-Female Dyads**
Rachel Griffiths, Laiken Peterson, Ronald Lockington, Jacob Harriman
Faculty Mentor/Collaborator: April Bleske-Rechek

A unique challenge for opposite-sex friends is convincing others of the platonic nature of their relationship (O’Meary, 1989), perhaps because opposite-sex friendships are often NOT clearly platonic
In the current study, we aimed to determine whether male-female friendship pairs are reliably and accurately recognized by outside observers as friends, or if they are instead mistaken as romantically involved. Male and female researchers engaged in a 90-second observation of 98 male-female dyads sitting in a lounging area at UWEC, and recorded their independent judgment of the dyad’s relationship status and each dyad member’s level of romantic attraction to the other person. Then, researchers approached the dyad, and interviewed each member about their actual relationship status, romantic attraction to their partner, and perception of their partner’s romantic attraction to them. Pairs of observers did not show consensus in their judgments of each dyad as friends or romantically involved. Both male and female observers incorrectly inferred romantic involvement for over half of the dyads who were friends. Both male and female observers consistently overestimated friends’ level of physical attraction to one another. We discuss potential explanations for low accuracy and consensus in judgments of friends’ relationship status and attraction.

**They Obviously Didn't Stand a Chance: Hindsight Bias in Judgments of a Dating Couple**

Michaela Gunseor, Jenna Maly, Paige Shafer, Megan Ross

Faculty Mentor/Collaborator: April Bleske-Rechek

When a romantic relationship ends, individuals often look back, blame themselves for things gone wrong, and ruminate about what they could have done differently (Choo, Levine, & Hatfield, 1996). In addition, others may tell them they saw the breakup coming. What is clear in hindsight, however, may have been unclear in foresight (Fischhoff, 1975). We investigated the effects of outcome knowledge on college students’ (N=181) and community adults’ (N=334) judgments of a romantically involved couple. All participants read about a couple with an uncertain relationship trajectory; while some participants subsequently received one of two outcomes (i.e., stay together/break up) about the couple's status six months down the road, others did not. Individuals who were told the dating couple broke up perceived that outcome as more likely and as more obvious than did individuals who were not given outcome knowledge or who were told the couple stayed together. Further, participants who were told the dating couple broke up judged the relationship more negatively than did participants who were told the couple stayed together. Overall, our findings suggest post-breakup blame, from either self or others, may be unwarranted because individuals cannot expect to know in foresight what becomes clear in hindsight.

**Undergraduate Students' Belief in the 50 Greatest Myths of Popular Psychology**

Amber Prell

Faculty Mentor/Collaborator: Carla Lagorio

The current study examines how many undergraduate students have heard of and believe in common myths that are prevalent in the field of psychology. Historically, these psychological myths have been misunderstood by many people and can lead to potentially unwise decision-making and further perpetuation of the myths. Students may enter introduction to psychology courses with misconceptions concerning psychological topics, so understanding the belief prevalence of these common myths can be essential for conveying accurate knowledge. For this study, historical data was examined that was completed by a sample of students enrolled in Introduction to Psychology at the University of Wisconsin-Eau Claire from January 2016 – January 2017. During this year, 230 students completed a class activity where they answered two questions about the “50 great myths of popular psychology” – whether they have heard of and believe in these myths. Results will highlight the myths that are most and least believed to be true. Ideally, this information will inform professors of topics that need to be better addressed in
classes, and longer-term data could produce information about historical trends in these common myths over time.

**Use or Reuse: How Students Acquire Fluids on a University Campus**  
**Saudamini Agarwal, Samantha Storzer**  
**Faculty Mentor/Collaborator: Blaine Peden**  
**Poster #: 132**

We explored University of Wisconsin-Eau Claire students’ response to the sustainability recommendation to reuse and recycle. Specifically, our poster presents a naturalistic observation study of sustainable liquid consumption by students at two campus locations: Hibbard Hall or Centennial Hall. Additional variables were gender (female or male) and type of bottle (reusable or disposable/recyclable). The findings were comparable at two locations in that students predominantly refilled bottles rather than purchase new ones. The results showed a relationship between gender and type of bottle. Females disproportionately filled reusable water bottles rather than purchase new bottles, whereas males more equally refilled and purchased bottles. We conclude that students follow the guidelines for sustainable fluid consumption. This study provides an incentive for future research into other aspects of sustainability and of those practicing it. For example, further studies can explore gender differences and similarities in other sustainability practices.

**Sociology**

**An Analysis on the Daily Activities and Their Associations of the Chinese Elderly**  
**Michelle Wagner, Yixuan Zhao, Ann Benner**  
**Faculty Mentor/Collaborator: Jianjun Ji**  
**Poster #: 227**

Using data from a national survey conducted by the China Research Center on Aging (CRCA) in 2006, this study seek to examine the relationship between the ability of the Chinese elderly to perform the activities of daily living (ADL) including cooking, eating, walking, toileting, getting-in and out of bed, bathing and dressing independently; in regards to their demographic location, gender, socioeconomic status and other psychological factors. By utilizing cross-classification and the Chi-square significance test, the findings show support for the main hypothesis. Issues concerning the elderly and policy repercussions are discussed.

**“Tough, but Good”: A Qualitative Study of the Positive and Negative Deviant Labeling of Sociology Professors on RateMyProfessors.com**  
**Morgan Marek**  
**Faculty Mentors/Collaborators: Jeff Erger, Pamela Forman**  
**Poster #: 228**

While there is much research on student evaluations of teaching, there is little research on professors as deviant in the classroom from a student perspective. This research attempts to establish reactions to violations of “professor norms” by content analysis of 3357 RateMyProfessors.com comments. Quantitative research has concluded that being easier “buys” better quality ratings. By dividing professors into 9 professor “types” and qualitatively coding data to allow for separate analysis of positive and negative forms of the supposedly same concept (e.g. helpful/not helpful), we question this finding. Analysis shows, 1) equal numbers of tough and easy “good” professors in our sample, 2) stronger and more frequent student reactions to negative forms of norm violation, 3) some positive labels that are strongly normatively ease related lose their ease normativity and become strongly quality norm related when they turn negative, and 4) risks to being seen as a more difficult professor that may lower quality...
ratings, risks that some professors manage to circumvent. We conclude that quantitative RateMyProfessors.com research may suffer from a failure to sufficiently conceptualize and measure the diverse labels applied by students to professor actions. Ease may not buy quality, but rather it may be that rigor risks quality.
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