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GRADUATE STUDENTS

HISTORY

Matthew Charles Carter (197)

Faculty Mentor/Collaborators: **John W. W. Mann**

Playing Through: African American Baseball in Dunn County, Wisconsin

This project looks at the oft forgotten and unknown history of African American baseball in Dunn County, Wisconsin. As African American baseball history is studied, it generally consists of the Negro Leagues and Jackie Robinson. My research concentrates on the barnstorming era prior to Jackie Robinson, which is roughly from the 1890s – 1950s. My research was done through primary and secondary sources, which consisted of newspaper articles, old scorebooks that were used to record the games as they were played, and numerous books on black baseball. Collectively, this project tells the story of African American baseball and how it affected Dunn County, Wisconsin and surrounding communities as these athletes traveled to areas that continuously had little interaction with minority groups. In the end, the importance that these barnstorming athletes played in the integration of professional baseball and society in general cannot be overstated and is as relevant to US history as much as it is to baseball history.

Heidi A. Heideman (195)

Faculty Mentor/Collaborators: **Patricia R. Turner** and **Jane M. Pederson**

“This Ain’t a Wild West Show:” How a German Community Became Wisconsin’s Rodeo City

In 1959 the rural Wisconsin farming community of Manawa, Wisconsin hosted its first rodeo. Although rodeo was not native to this area of Wisconsin, more than fifty years later the event continues to draw crowds and has become a permanent part of the community’s identity. Using archival data, newspapers and other primary sources, this project explores why and how this small Wisconsin community came to adopt rodeo as a communal cultural event. It argues that rodeo enabled Manawa to adapt to economic transformation as it evolved from a farming community and finally to a bedroom commuter town with a strong rural horse culture. The history of this community is a case study of changes in rural America, as it illustrates how economic and other social forces shape individual and group identity.

Jennifer Lynn Murray (196)

Faculty Mentor/Collaborator: **Patricia R. Turner**

The Chicago Religious Task Force on Central America: Moral Rightness and the Sanctuary Movement

This research examines the work of the Chicago Religious Task Force on Central America (CRTFCA), an organization which formed in 1980 in response to the murders of four U.S. religious women in El Salvador. As recent history, little scholarship exists on the organization and its influence as a resistance movement. The CRTFCA helped to establish the national Sanctuary movement, which aided the entry and safe transport of Guatemalan and Salvadoran refugees to churches across the country. Although they were without legal right, the members of the Sanctuary movement granted political asylum to these refugees. The project mainly draws on primary sources accessible through the organization’s archives. Upon examination of newspaper articles, meeting minutes, and literature dispersed by the CRTFCA, it becomes clear that the Task Force created a moral space of legitimacy for an illegal activity. Their ethical arguments demonstrating their righteousness were structured by three pillars: 1) the Bible and God as a higher law 2) a historicized moral tradition of the Underground Railroad and 3) an indictment of the U.S. government for crimes against humanity as referenced through the Nuremberg war crimes trials following World War II.

Todd William Theiste and Heidi A. Heideman (194)

Faculty Mentor/Collaborator: **John W. W. Mann**

Immersed in History: Three Weeks in Virginia City, Montana

On June 8, 2011, eleven weary University of Wisconsin-Eau Claire (UWEC) students arrived in Virginia City, Montana, to embark upon three weeks of immersive study in the region’s history in order to learn the importance the landscape plays in historic events, ways to determine that impact, and to gain practical hands-on experience in “doing” history. The field school was a collaborative effort between UWEC, Washington State University, the Montana Heritage Commission (MHC), and the Shoshone-Bannock Heritage Council. The students were given behind-the-scenes tours of Virginia City, Nevada City, buffalo jumps and Indian dacite quarries, and received instruction on reading the landscape. The students were also

exposed to various public history sub-fields and practitioners through meeting MHC's employees. The students spent several intensive days researching in the county courthouse, local library, newspaper archives, and other repositories, as well as interviewing residents and utilizing online resources. Their ability to evaluate the landscape enhanced the collating of their research findings. The students performed this research in order to prepare display panels enabling the MHC to include the stories and experiences of various minority groups (African-Americans, Chinese immigrants, and Lemhi Shoshone Indians) in Virginia City's interpretive efforts. A presentation of the draft panels was also made to interested residents.

NURSING

Elizabeth Irene Christman (185)

Faculty Mentor/Collaborator: **Cecelia R. Zorn**

Cultivating Educator Skills

Many educators enter the classroom environment as experts in their specialty of practice, but have had little opportunity to develop educator skills. In order for new educators to grow in their professional development, institutions must provide them with resources for mentorship and skill-building. The University of Wisconsin-Eau Claire offers new educators the opportunity to participate in development workshops sponsored by the Center for Excellence in Teaching and Learning (CETL). In the fall 2011 semester I partnered with CETL in facilitating new educator workshops. I attended bi-monthly educator workshops and facilitated discussion around topic areas including instructional course design, teaching methods, assessment, and professional growth. Following each session, I recorded my personal reflections regarding the educators' observations of topic content. I also aided in the development and analysis of the CETL new-educator assessment survey to gain insight into program value. As a nursing education graduate student, working with CETL, I reflected on the power of interdisciplinary collaboration, recognized the usefulness of development activities in the growth and change of novice educators, acknowledged the development of my personal facilitation skills, and uncovered personal applications for use as a new educator.

PSYCHOLOGY

Glenna A. Bieno, Megan Ashley Eparvier and Anne E. Kulinski (198)

Faculty Mentor/Collaborator: **Mary E. Tusing**

Linguistic Demands of Preschool Cognitive Assessments

The linguistic demands of cognitive assessments can pose significant challenges to a practitioner's ability to validly estimate a child's cognitive functioning. If the spoken directions of an assessment demand receptive language abilities that are greater than typical expectations for the child's chronological age, results may underestimate the child's true cognitive functioning. The purpose of the present study is to assess the linguistic demands of spoken directions for three preschool cognitive assessments: the Kaufman Assessment Battery for Children II, the Differential Ability Scales II, and the Wechsler Preschool and Primary Intelligence Scale III. The two methodologies employed to analyze the linguistic demands of spoken directions include a Basic Concept Word review, and a Verbosity and Complexity review. Researchers then compared findings to an Expert Analysis of Linguistic Demands by Flanagan, Mascolo, and Genshaft (2000). Conclusions to be drawn regarding the linguistic demands of the three assessment tools appear to vary as a function of analysis type. As a result, practitioners are encouraged to consider the various ways in which a child's linguistic competencies may impact test performance and select the cognitive assessment tool least likely to be impacted by the child's linguistic abilities.

Robin Rae Frei (183)

Faculty Mentor/Collaborator: **Mary E. Tusing**

Consultation with Teachers: Visual-Performance Feedback on Acknowledgement within Positive Behavior Interventions and Supports

Positive Behavior Interventions and Supports (PBIS) is a proactive behavioral management program that is implemented school-wide. This program is important to schools, as it remediates student behavioral problems in a positive multi-level systems approach. One of the components of PBIS is the acknowledgement teachers deliver to students to reward positive student behavior. Acknowledgement is delivered to students by praise statements and tangible reward slips. The tangible reward slips offer an opportunity to collect permanent product data, or data that already naturally exists. The current study utilized permanent product acknowledgement slip data by collecting copied slips weekly from nine teachers. A single subject design methodology was employed to see the effects of providing Visual-Performance Feedback (VPF), or data

that is graphed for individual review, to teachers on their rates of delivery over time. Individual VPF review is considered a way to support and monitor teachers implementation of the acknowledgement portion of PBIS. It was hypothesized that VPF review would result in changes to teacher acknowledgement delivery and therefore contribute to fidelity of the PBIS system. Results suggest that weekly visual feedback review is not frequent enough to support change in acknowledgement delivery for most teachers in the sample.

Krystle A. Kaifesh (184)

Faculty Mentor/Collaborator: **Jeffrey A. Goodman**

Comparison Between Rural and Urban School Psychologists' Actual and Preferred Roles: Examining the Reasons for Change

Wisconsin public education mandates requiring a response to intervention system by December 1, 2013 are expected to change the role of school psychologists to include more data analysis, intervention implementation, and program evaluation. School psychologists from Wisconsin will be contacted to complete an electronic survey. The goal of this prospective study is to understand the roles of school psychologists in Wisconsin, discover what might be influencing the change towards an expanded role beyond psychoeducational assessment for special education eligibility, and to get a sense of the overall job satisfaction of school psychologists in Wisconsin. Comparisons will be made between practitioners in rural, urban, and suburban school settings. The results from this project may provide awareness about progress in Wisconsin related to education reform efforts and can help understand mechanisms for change in an education system. Anticipated results will indicate that school psychologists in Wisconsin spend the most amount of time in psychoeducational assessment, are generally satisfied with their profession, and describe everyday challenges (i.e. number of referrals and case load) as mechanisms for change.

EDUCATION AND SCHOLARSHIP OF TEACHING & LEARNING

COMMUNICATION SCIENCES AND DISORDERS

Leah Jean Craft, Holly Elizabeth Forst and Rebecca Ann Schulz (214)

Faculty Mentor/Collaborator: **Kristine Retherford**

Instructional Strategies for Facilitating Literacy in Children Diagnosed with Autism

Children with autism within the mainstream classroom are receiving literacy instruction with their typically developing peers without disabilities. However, children diagnosed with autism may require very different techniques to ensure that they acquire the literacy skills necessary for academic achievement. The purpose of this project is to identify instruction used by general education teachers and to determine if that instruction is specific to the needs of children identified with autism. Specifically, teachers of children who have been identified with autism will be surveyed to identify instructional pedagogies employed in reading instruction. Within the survey, we will provide reading strategies commonly used in mainstream classrooms today as well as other critical background information of the educator. Educators will be able to specify any other strategies that they use in their individual classrooms. We will use the results from the survey to better aid us in our analysis. Results will be used to address the literacy needs of children with autism and increase academic outcomes. With research still in process we expect our results to show there is deficit in individualized reading strategies used with children identified with autism.

Allison Paige Kallstrom, Kathryn Marie Albers, Emily Katherine Cable, Bridget Catherine Foley, Jamie Lynn Milanowski, Morgan Marie Pieper and Kyla Marie Schaub (215)

Faculty Mentor/Collaborator: **Marie A. Stadler**

A Survey of Speech-Language Pathologists in the Wisconsin Birth to 3 Program

The goal of this research project was to determine if speech-language pathologists, working in the Wisconsin Birth to 3 program, are providing speech sound intervention to young children and their families. The evidence base to support such interventions is limited. These limitations include a small number of children from ages 0-3 in the study samples and widely diverse methods of interventions. A survey was developed and disseminated via Qualtrics to Wisconsin Birth to

3 program speech-language pathologists. Results are expected to report differences in practice and teaching strategies of speech-language pathologists across Wisconsin counties if speech sound intervention is provided.

Allison Paige Kallstrom, Emily Katherine Cable, Bridget Catherine Foley, Jamie Lynn Milanowski, Morgan Marie Pieper, Kyla Marie Schaub and Kathryn Marie Albers (216)

Faculty Mentor/Collaborator: **Marie A. Stadler**

A Survey of CSD University Instructors

The goal of this research project was to determine if Communication Sciences and Disorders (CSD) university instructors teach their students about speech sound intervention to children under the age of three years. The evidence base to support such interventions is limited. These limitations include a small number of children from 0-3 in the study samples and widely diverse methods of interventions. A survey was developed and disseminated via Qualtrics to professors across the United States, who specialize in articulation/phonological disorders. Results are expected to report differences in the frequency with which instructors teach this information, differences across the country, and differences based on instructors' training and experiences.

DEAN OF STUDENTS

Sarah Ashley Tweedale, Elsa Dorothy Kraus, Nicholas John Severson, Mary Elizabeth Wolf, Jacqueline Ann Lee, Virgil Ward, Mathias Jeffrey Hughey and Paul Kieran Williams (265)

Faculty Mentor/Collaborator: **Jodi Marie Thesing-Ritter**

The Impact of the Civil Rights Pilgrimage on UW-Eau Claire Students' Intercultural Knowledge and Competence

The Civil Rights Pilgrimage (CRP) is an intercultural immersion trip that takes students throughout the South visiting relevant cities and historical landmarks, meeting foot soldiers of the Civil Rights Movement, and applying the larger context of the Civil Rights Movement to social justice issues today. Previous research on the CRP has demonstrated that participants tend to report lower levels of racism and classism. The present focus of the research is a pre- and post- evaluation using the Modern Racism Scale (MRS), the Modern Sexism Scale (MSS), and White Privilege Attitudes Scale (WPAS) as a continuation of previous research. This research assesses the movement in scores that CRP participants reported, using the Association of American Colleges and Universities (AAC&U) rubric of Intercultural Knowledge and Competence. The MRS, MSS, and WPAS, along with questions developed by the research team will assess the knowledge, skills, and attitudes, as per the AAC&U rubric, in past CRP participants. We expect that the students who participate in the CRP will express higher levels of intercultural competence and decreased levels of sexism and racism.

EDUCATION STUDIES

Elsa Dorothy Kraus and Shantee Scheel (238)

Faculty Mentor/Collaborator: **Deborah K. Pattee**

Ms. Adventure Girls: A Critical Feminist Pedagogical Empowerment Program for Pre-Adolescent Girls and Mentors

The Ms. Adventure Girls program is a pre-adolescent youth development after-school organization that focuses on issues relating to girls' wellbeing. The target populations of this program are under-resourced pre-adolescent girls that lack sufficient attention in the areas of education, and emotional, social, and physical wellbeing, and their female university student mentors. For the present research study, the researchers examined the influence and impact of the program curriculum and the mentoring component both qualitatively and quantitatively for the themes of self-esteem and wellness. Using a feminist pedagogical methodology, an egalitarian, inclusive and collaborative approach to empower all the participants to be agents of social change, the assessment of the experience was monitored via reflections, a focus group and the Harder Self-Esteem Test. The researchers predict that the reflections and focus-group and self-esteem test results will indicate a transfer of training—applying learned material to real life situations—for all participants. The transfer of training will positively influence and mutually benefit all participants in the study.

Marguerite Katherine Parks (237)

Faculty Mentor/Collaborator: **Incho Lee**

Content Area Pre-service and In-service Teachers' Knowledge and Attitudes Toward English Language Learners

The present research project is designed to discover the attitudes and knowledge of pre-service and in-service teachers about English Learners (ELs). Despite the increasing number of ELs in the United States, many content area teachers find themselves unprepared to teach content knowledge and English to the ELs. How do they perceive their ELs and how do they plan to modify their lessons for ELs? The participants of this study, upper level undergraduate students and graduate students in the College of Education and Human Sciences at the UWEC, will be asked to complete an online survey. The data will be analyzed to see how well content area pre-service teachers are prepared to teach ELs in a mainstream classroom. Through this research, suggestions will be provided for teacher educators and higher education institutions to ensure that all pre-service teachers are well equipped with skills, dispositions and knowledge to work with ELs effectively.

ENGLISH

Caitlin Elizabeth Rathburn, Christina Marie DeLapp, Olivia Jo Krueger, Nicole Lyn Pietila and Andrew Paul Storsveen (241)

Faculty Mentor/Collaborators: **Shevaun E. Watson** and **Carmen K. Manning**

The New English 110: Researching and Assessing The Blugold Seminar in Critical Reading and Writing

This research encompasses two related studies: a 2011 summer research project that developed curriculum materials for the new English 110 course, and a 2011-2012 academic year project that assessed the new curriculum. As there are various current approaches to first-year composition programs, the research primarily investigated the efficacy of these methods. This project was an opportunity for English education students to build their curriculum development skills and understand how to use current research to inform curricular design. This study is also significant in that it addresses how to best serve special populations of writers, including basic writers, English language learners, transfer students, and high-performers. Throughout the summer, students researched current best practices in teaching first-year writing and developed curriculum materials, including faculty guides, activity sheets, and student materials. During the academic year, students investigated the effectiveness of the new course via focus groups and surveys. Preliminary results show the curriculum to be successful in establishing both success in and positive attitudes toward the first-year composition course. Results also indicate that first-year students perceive greater cross-disciplinary relevance for the skills taught in the new course.

FOREIGN LANGUAGES

Shaleh Husaikan AlShammari, Zheng hao Chen, Yijia Chen, Chengyi Li, Jindong Zhao and Qiang Zhang (273)

Faculty Mentor/Collaborator: **Julie D. Adler**

Perceptions of the Need for Study of Foreign Language in Business

The number of international students at UW-Eau Claire is increasing. The largest number of students come from China. The majority of these students are business majors. The students in ESL 291 (Introduction to Academic Research in U.S. Culture) wondered how the requirements of the business program at UWEC differed from those of business programs in similar-sized universities in China. During their background research, they found that the foreign language requirements differ significantly. The students decided to survey UWEC business majors currently in International Business classes to find out: 1) their perception of the need for Foreign Language study, and 2) which languages they perceive as most valuable for international business students. The ESL 291 students will design a Qualtrics survey for students enrolled in MGMT 345 (Managing Global Organizations, [75 students]) and MKTG 335 (International Marketing [71 students]). The ESL 291 students will compile and analyze the results of the survey to answer their research questions. Results will be shared with the School of Business, and with the department of Foreign Languages.

Eric Paul Daubert (236)

Faculty Mentor/Collaborator: **Anne Cummings Hlas**

An Investigation into the Effects of Blended Learning in Students' Second Language Learning

Hybrid education has become increasingly common as an alternative and/or additional curriculum design in the postsecondary system. Students learn through a dual format; half of the instruction is in the classroom, while the other half is given through online instruction. The study attempts to determine if the hybrid experience is effective by examining participants' beliefs about the program and their desire to continue learning Spanish. 18 students participated in an exploratory hybrid Spanish course on the UWEC campus. Their experiences were compared to Face-to-Face (F2F) Spanish courses. Participants were asked to complete two language belief and ten 5 minute engagement surveys. Final exam scores were compared to the F2F classes. Preliminary findings suggest that hybrid participants may view reading, grammar, and pronunciation in the target language (TL) as being less difficult, with students' potentially perceiving writing, listening, and speaking in the TL as more difficult. Initial results suggest that students may prefer to learn grammar through the F2F format over the hybrid, and they may prefer a hybrid format for reading/writing, but don't prefer it for the learning of culture/speaking. Lastly, comparisons of final exam scores between hybrid and F2F students reveal comparative final exam scores between the two cohorts.

Kayla Heather Noel and Samara Sarahi Gaitan (240)

Faculty Mentor/Collaborator: **Kate Mastruserio Reynolds**

Being Strategic about Strategies

Drawing upon teachers' and teacher educators' working definitions and examples of strategies, the presenters will share perspectives on how the concept of strategies differs between teachers and teacher educators. In determining what exactly constitutes a strategy in the field of education, thorough research was conducted by means of personal interviews, online surveys, and literature reviews to show the differences and similarities that exist in what is expected when strategies in the field are presented and discussed. Focus was given to the differences between learning (Wenden 1987), communication (Kasper 1997), language learning (Oxford 1990), and instructional (Gregory 2008) strategies in a K-12 classroom. This poster presentation will demonstrate through extensive qualitative and quantitative data that miscommunications between teachers and teacher educators exist in relation to what strategies are while highlighting how each of these groups defines and limits the term. The poster session shares the significance of this research, the findings of each group's use of terms, examples of each type of strategy, as well as discussions and recommendations for educators on how we can effectively communicate our work. The poster presents new insights and understandings of "strategies" and professional communication as well as their importance.

Laura Jean Szymanski and Kayla Heather Noel (274)

Faculty Mentor/Collaborator: **Jessica S. Miller**

Effects of Technology vs. Traditional Conversational Activities on Foreign Language Oral Proficiency Acquisition

Does the technology made available to classrooms in recent years facilitate an enriched learning experience? This exploratory study analyzes existing literature and data from a French class to gauge the degree to which students feel that podcasting is helpful for their French language development. For comparison, data was gathered from students participating in traditional conversation tables who were asked to reflect upon the strategies they employed to monitor their speech while conversing. The preliminary results suggest that producing podcasts helped the students' language proficiency. Using technology was helpful because learners were able to listen to themselves later, identify mistakes, and correct them. However, a drawback the students reported was that recorded conversations sometimes felt unnatural. On the other hand, self-monitoring at conversation tables was complex and students often focused on grammar to the detriment of other important skills, such as pronunciation and vocabulary.

MATHEMATICS

Meghan Marie Christenson and Julia Marie Baranek (239)

Faculty Mentor/Collaborator: **Manda R. Riehl**

Opportunities for Outstanding Mathematics Performance for Hmong Students (OOMPH)

OOMP (Opportunities for Outstanding Mathematics Performance for Hmong Students) is a mathematics enrichment program designed for Hmong high school students. OOMP is designed as a hybrid program between a math circle and

preparation for mathematics competitions. Each year, the program serves 10-30 students at varying levels of math, ranging from Algebra to Calculus. When we attempted to find resources for teaching high school mathematics to Hmong audiences, we found none to very few. We therefore researched Hmong culture and history, as well as literature about the challenges students from other cultures face, in order to design lessons and activities that would be culturally relevant and engaging for the students. We assessed the effectiveness of our program by student performance on a skills exam and affective data about the students' confidence and interest in mathematics taken at the start and end of the program. We plan to use this data and feedback from the students to further enhance the program for years to come.

PSYCHOLOGY

Allison Kaye Gehring (213)

Faculty Mentor/Collaborator: **Michael I. Axelrod**

Applying Brief Experimental Analysis to Empirically Select Interventions that Improve Oral Reading Fluency

The purpose of this study was to evaluate a method to empirically select oral-reading-fluency interventions (Brief Experimental Analysis) for two second-grade students with below-average reading abilities. Data-based decision making in education is important because it allows educators to be efficient in achieving positive outcomes (Reschly, 2008). Finding effective methods to empirically select academic interventions might help educators engage in effective data-based decision making. Following baseline, three brief reading interventions and all combinations were tested to determine which approach produced the greatest number of words correctly read per minute. The selected intervention was then implemented over four to nine sessions to evaluate its effectiveness. Results suggest that Brief Experimental Analysis of oral reading fluency did identify an effective intervention for both students. In addition, effective interventions lead to increases in the number of words read correctly per minute. The findings are important for educators looking for quick strategies to identify effective interventions.

SERVICE-LEARNING

Timothy Terry Cunningham (74)

Faculty Mentor/Collaborator: **Donna Lehmkuhl**

ECLIPSE (Early Childhood Literacy Intervention Program, Services, and Evaluation)

Without individualized support, many pre-school children fall behind their peers in terms of language, literacy and social performance. ECLIPSE (Early Childhood Literacy Intervention Program, Services, and Evaluations) works to prepare children to enter school ready to learn. The purpose of our research is to identify the impact that ECLIPSE has had on both 3-5 year old children and our AmeriCorps members. An adapted version of High Scope's COR was used as a pre and post-test and administered by the classroom teachers for child data. A modified version of "The Teacher's Belief Scale" with additions was used as a pre and post-test for the AmeriCorps members to identify growth or change in beliefs. Results for the first year demonstrate that ECLIPSE children had higher mean scores in literacy, language, social skills than the non-ECLIPSE children. In addition, ECLIPSE corps members made significant gains of knowledge in the areas of early childhood knowledge, and have increased levels of civic engagement from the beginning of the year.

SOCIAL WORK

Victoria Marie Hay and Jessi Lee McIntosh (261)

Faculty Mentor/Collaborator: **Vanda Galen**

Transformative Learning and International Volunteers

Service learning and volunteerism are of critical importance to both the University of Wisconsin-Eau Claire and the field of social work. In the interest of fortifying these values, our research gathered evidence of causality between the disorienting elements of international volunteerism and the transformative learning process. Twenty-six qualitative interviews were conducted with individuals who volunteered in two Guatemalan cities during January 2012, with the researchers. Candidates varied in age and experience, including high school students and retired individuals from throughout the United States who volunteered in Guatemala. Interviewees were then selected using a non-probability sample on the basis of availability and willingness to participate in the study. Each subject was asked a predetermined set of standardized questions involving the history and motivation behind his or her volunteer experiences, and the personal values and views of poverty related to his

or her ongoing volunteerism. Audio recording devices assisted interviewers in preserving the integrity of all statements and fostering accurate analysis. Though this study is still in progress, researchers will report and compare trends in international volunteers' motivation and cross-cultural learning before, during, and after their experiences in Guatemala.

SPECIAL EDUCATION

Chelsea Bahnub, Caitlin Marie Keller and Rachel Anna Mae Lavold (193)

Faculty Mentor/Collaborator: **Rosemary L. Battalio**

Expanding Boundaries: Program Improvements for a Deeper and Richer International Experience

The purpose of this research was to determine if changes to the Special Education in the Scotland program would increase awareness of and sensitivity to cultural differences, such as: development of a structured reflection process, inclusion of a Scottish education professor, and the addition of more organized discussions. For future teachers and school personnel it is important to have a better understanding and sensitivity to cultural differences as they may teach a diverse population of students. The Intercultural Development Inventory (IDI) determined if participants' pre- and post-program perceived cultural awareness scores were similar to their actual cultural awareness scores. In addition, participants used structured questions to reflect on a variety of topics including politics, behavior management, language, and family life. Scores noted a significant difference between perceived and actual scores on both the pre- and post- IDI assessments with perceived scores being higher than actual scores. The reflections revealed: (a) political conversations were uncomfortable and most students avoided them, (b) having the university lecturer present to the students enhanced their awareness and understanding of inclusion and national curriculum issues, (c) behavior management in schools was seen as more lax and less proactive, and (d) families and communication were similar, yet differences emerged that made being aware of situational context important.

FINE & PERFORMING ARTS

ART & DESIGN

Michael David Carey and Skyler John Moucha (257)

Faculty Mentor/Collaborator: **Ned B. Gannon**

Illustrated/Written Graphic Novel

The purpose of this project was to explore the process of working completely digitally to illustrate a graphic novel. We live in a world that is becoming increasingly more digital with every day that passes and with that in mind I want to be at the forefront of this new digital movement within the art community. To achieve this goal I decided to work with the latest and most innovative drawing technology that is available which is a drawing tablet called the Wacom Cintiq. This is a tablet that allowed me to use programs such as Adobe Photoshop and draw directly on the pressure sensitive LCD screen with a unique pen stylus. As I have come to find out with my research for this project, graphic novels require a great deal of time to illustrate (and are usually done by three separate persons, a penciller, inker, and colorist) which is why I will continue to work on this project to complete more pages and further pursue the benefits of working completely digitally.

Glenn Allen Terpstra (280)

Faculty Mentor/Collaborator: **Wanrudee Buranakorn**

Defining a Formula for Highly Effective Graphic Imagery

This research seeks common ground between the visual and digital worlds. Certain Visual Elements simultaneously accommodate digital objects' quick movement and facilitate their even quicker interpretation by viewers. Whether positive or negative, graphic images shape viewers notions of reality; with a globalized audience, advertisers need to understand how theories of artistic appeal (mostly western-articulated) intersect with what attracts and dictates eye movement (mostly Biologically-articulated). The methods for acquiring how an individual assess visual information include open source eye tracking software OGAMA and an adapted web cam. Participants were asked to observe a series of black and white images, of varying quality levels (resolutions), while the camera recorded and traced their eye-movement across a 16:9 computer screen to observe similarities in the pattern to eye-movement between individuals. The results collected from this approach indicate locations within images where participants commonly experienced fixations or pauses, representing the biological

tendencies of the scanning process. Refinement to the equipment would yield a more precise result, however there exist elements indicative of similarities for human vision in correlation to the computer screen. It is important to continue this research and further develop the technical understanding of eye-movement based design for stronger global communication.

Glenn Allen Terpstra (281)

Faculty Mentor/Collaborators: **Wanrudee Buranakorn** and **Sean A. Ford**

Super Graphics

The purpose of this research is to investigate the visual components of presentation design in an attempt to provide the students and faculty of the University of Wisconsin-Eau Claire with cutting edge presentation approaches. Visual aids improve audience information retention by 80% over a strictly oral presentation; this yields the need for strong, visual presentation that may compete with our highly visual world. The use of computer applications such as Microsoft Power Point, for creating a presentation, maintains many visual risks commonly overlooked prior to presenting. By attending lectures on presentation methods, and researching current trends in digital presentations compared to the biological realities of humans' visual abilities, the formation of a concise reference was possible. This research results in the creation of a helpful reference card, dispersed across the UWEC campus, and correlated website that aids in the creation of a visual presentations.

COMMUNICATION/JOURNALISM

Xiangyun Chen (279)

Faculty Mentor/Collaborator: **Ellen D. Mahaffy**

Cross-Cultural Exploration of China

Within three weeks in winter 2011 – 2012, Professor Ellen Mahaffy and Xiangyun Chen, an undergraduate student, travelled to six major Asian cities, visiting renowned heritage sites which lie in the Yangtze River region. The goal of the project is to create a body of photographic work, viewing China from an American prospective (Prof. Mahaffy) and a Chinese prospective (Xiangyun Chen). The real world experience gained from the project is significant to Chen as both a photographer and a student. It challenged proposal writing, travel and itinerary planning, crisis management and photographic communication. The project is currently in post-production while Prof. Mahaffy and Xiangyun Chen work to create a more finished and polished portfolio of work. The outcome will be presented as national and international exhibitions, which will be held in UW-Eau Claire community (2012 Spring) and Chongqing, China (winter 2013).

MUSIC AND THEATRE ARTS

Jordyn Elizabeth Beranek and Andrew Patrick Steffen (276)

Faculty Mentor/Collaborator: **Mitra M. Sadeghpour**

“L’heure du Mystère” : Cécile Chaminade in America

The career of Cécile Chaminade (1857-1944), French composer and pianist, paralleled important events in the women's movement in the United States and she was highly captivating to American women as both public figure and musician. At the urging of her admirers, in 1908 she crossed the Atlantic Ocean and embarked on a 17-concert tour of 12 cities which traveled throughout the upper Midwest, including stops in Minneapolis and Milwaukee. Our research project, based largely on primary sources such as concert programs, reviews, newspaper ads, and records from several “Chaminade Clubs,” thoroughly investigates this American tour in the context of the changing role of women in American life and on the American musical scene. We explore the concerts themselves, the singers who performed them accompanied by Chaminade, their popular and critical reception, and of course, the music itself which is infused with wit and élan. The characteristics of late Romantic French song and nineteenth-century French salon music elegantly intermingle in the songs, which are worthy of further study outside the fascinating context of Chaminade's “L’heure du mystère” in the United States. The project culminated in a lecture-recital which recreated portions of the tour concert program and illustrated numerous Wisconsin connections.

David Ray Sumner, Heidi Rose Joosten, Peter Carl Diedrick, Cody Bradford Christian, Karl Gordon Lepp and Philip Patrick Reilly (272)

Faculty Mentor/Collaborator: **Ethan F. Wickman**

Ensemble 61 Composition Project

Our research group of six UW-Eau Claire BM-Music Composition majors collaborated with Ensemble 61, a professional new music ensemble based in Minneapolis, to create new compositions in a process simulating the professional experience. This project gave us real-world experience in transmitting information through highly specific music notation and performance instructions—necessary characteristics for a piece of music to distinguish itself in a saturated 21st century market. By working closely with the performers, we developed compositional techniques specific to each instrument in the group (piano, cello, and percussion) and each composer's individual style. We accomplished these goals via two master classes and frequent electronic communication with the ensemble. On March 11th, 2012, Ensemble 61 presented our works in a "Guest Artist" recital in the Haas Fine Arts center. This recital was the culmination of over three months of composition, revision, and rehearsal, and will be preserved both in score format and audio recording in each composer's portfolio, as well as on compact disc in the UW-Eau Claire archives.

Leisa Amelia Sunier, Gregory Matthew Ellis, Ben Thomas Hase and Jennifer Noel Newton (275)

Faculty Mentor/Collaborator: **Ethan F. Wickman**

New Voices and Old Songs: Setting Hildegard of Bingen to Music

The purpose of this study is to facilitate the collaboration between student composition majors, in this case three, and a student vocal performance major to create a new song cycle based on the writings of Hildegard of Bingen. The influence of this research is two-fold in that the students may gain a better understanding of the impact and relevance of Hildegard's writings as well as her legacy with regards to contemporary culture. It also offers all students involved the rare opportunity to collaborate in the creation of a new work from conception to performance. Each composer focuses on one of the following specific aspects of Hildegard's works: church writings, scientific writings, and her views on the representation of women in her time period. In addition, each piece calls upon different instrumentation, allowing both the composers and the singer to benefit from exposure to unfamiliar instrumental pairings and new sounds.

HEALTH SCIENCES & SERVICES

AMERICAN INDIAN STUDIES

Amanda Marie Lonsdorf (217)

Faculty Mentor/Collaborator: **Wendy Makoons Geniusz**

Exploring Indigenous and Western Medicines from an Integrative Medical Perspective

Indigenous medicines and healing practices have existed for countless generations of known history, yet only in the past few decades has mainstream medicine philosophy and practice begun to even consider their validity. Throughout history non-natives have had mixed reactions to Indigenous knowledge and cultures. The purpose of this research is: to examine the historical foundation of the dissonance between Indigenous and non-Indigenous healing practices and to untangle the layered complexity of contemporary perspectives, issues and conflicts between non-Indigenous and Indigenous medicines. The data for this interdisciplinary research is drawn from primary and secondary sources, including historical, autobiographical, biographical, and linguistic documents. This research draws from decolonizing and integrative medicine methodologies. Initial conclusions find that although integrative medicine is gaining some acceptance in mainstream healthcare practices, Indigenous medicine continues to be seen as inferior.

ENGLISH

Mariah Rose Quick (120)

Faculty Mentor/Collaborator: **David M. Jones**

The Battle at Home: How Family Counseling Can Strengthen Our Military

As the war overseas continues new research and leadership is needed to find effective means to emotionally support troops and their families. In the 21st century, the demographics of the military have drastically changed; according to the journal *Family Relations*, at least 60% of troops have significant family responsibilities. Positive familial relations have been connected to military success. Policy change was attempted in the 1990s as the frustrations among military families rose. These changes were ineffective; in one study, less than half of surveyed families thought they were in any way beneficial. Frequent relocation, anxiety associated with deployment, and adjusting to everyday life upon the troop's return are three issues creating additional stress for military families. This poster highlights the struggles many military families face by examining three common scenarios, newlyweds, divorce and the effects of post-traumatic stress disorder. Also examined is the changing demographics of the United States military. Current policy does not support the families of those in service. Counseling efforts have been shown to have a negative effect on the families compounding problems. The mental health of soldiers' families directly affects their performance in service. Providing families with improved counseling services is critical for strengthening America's military.

ENVIRONMENTAL PUBLIC HEALTH

Gregory Thomas Nelson, James Joseph Robert Fay and Andrew David Kleist (97)

Faculty Mentor/Collaborator: **Crispin H. Pierce**

Environmental Crystalline Silica Exposure in Wisconsin: A Risk Assessment and Evaluation

As many new and proposed sand mines and processing plants in Wisconsin add to the 2,300 current industrial sources of respirable crystalline silica (RCS), public exposure to particulates including RCS is increasing rapidly. RCS occupational studies have documented causation of silicosis, tuberculosis, kidney disease and lung cancer. Exposure to the public is regulated in five states, but not in Wisconsin where the Department of Natural Resources has determined that not enough data exist to establish an exposure standard. Our approaches in Gaussian dispersion modeling, aerosol and gravimetric measurements, and citizen monitoring were used to assess PM 10, PM 4, PM 2.5 and RCS levels before and after construction of a large sand processing plant to assess potential health risks in a Wisconsin community. We were unable to detect any amount of RCS upwind or downwind of the facility. We did find slight increases of respirable particles downwind of the facility. Although no traces of RCS were measured, our detection limit was twice the established environmental exposure standard established in the state of California. We stress the need to continue monitoring with better equipment and lower detection limit in order to better determine the risks of exposure around this facility.

FOREIGN LANGUAGES

Shayna Ashley Friday (212)

Faculty Mentor/Collaborators: **Analisa E. De Grave** and **Norah M. Airth-Kindree**

Language Services Offered to Spanish-speaking Limited English Proficiency (LEP) Latino/Hispanic Patients by Hospitals in Western Wisconsin

This study explores the language services offered by hospitals in western Wisconsin to Spanish-speaking Limited English Proficiency (LEP) patients. Based on The Joint Commission's standards and policies, we distributed and analyzed the results of three surveys— a separate survey for hospital administrators, staff, and interpreters. These instruments helped us to assess the level of communication and quality of services offered to LEP patients. There has been a constant increase of Spanish-speakers in western Wisconsin and it is important that under any emergency situation these patients receive proper and effective medical treatment. We hoped to gain an understanding of how well hospitals in western Wisconsin are reacting to such an influx of Spanish-speaking patients. Our responses indicated that hospitals are aware of the demographic changes taking place in our region, and many of the participants feel that their facilities are accommodating the needs of the Spanish-speaking LEP patients. However, data from our responses indicates a lack of certified training *among* staff members and medical interpreters and a need for the formalization of communication procedures at the institutional level. It is essential that hospitals work towards an environment where LEP patients receive the highest quality of care and where effective communication is possible.

KINESIOLOGY

Kelly Ann Auner, Talisa Marie Emberts, Robert Michael Kaatz, Kaelyn Marie Matteson, Emily Anne Muller and Mitchell Patrick Cook (8)

Faculty Mentor/Collaborator: **Jeffrey M. Janot**

The Effects of BungeeSkate™ Training on Measures of On-Ice Acceleration and Speed

Previous research findings state that dry-land sled pulling improves first step quickness in hockey players. Further research demonstrates that off-ice horizontal training (sled pull, parachute, etc.) relates well to on-ice acceleration and speed. However, there is limited literature pertaining to on-ice resistance training intending to enhance hockey players' speed and acceleration. The purpose of the present study was to determine if the on-ice training method known as BungeeSkate™ improves the on-ice speed and acceleration of youth hockey players. Twenty-four Peewee and Bantam hockey players (ages 11-14) participated in this study. Pre- and post-testing consisted of an on-ice, 44.8m speed test, a 6.1m acceleration test and a 15.2m full speed test. The training protocol consisted of eight sessions over a 4-wk period. Training sessions included 12 minutes of on-ice BungeeSkate™ training. Our hypothesis is that the on-ice speed and acceleration of youth hockey players will improve through four weeks of on-ice BungeeSkate™ training.

Rachel Lucretia Behmer, Kaitlin Klos and Andrew Daniel Meschke (168)

Faculty Mentor/Collaborator: **Robert C. Stow**

External Collaborator: **Dr. Karl Stien, Sacred Heart Hospital**

The Effect of Decreased Hip Range of Motion on Seated Posture

Femoroacetabular impingement (FAI) results from an abnormal contact between the femur and the pelvis. Due to this impingement, the individual experiences pathological changes or conditions in the femoral neck, labrum, and/or acetabulum. It was our intent to investigate whether individuals experiencing hip impingement or discomfort due to clinical signs associated with FAI were more likely to adopt a slouched position while sitting in class. A video recording was taken of each participant's seated posture during a class period, followed by a clinical evaluation of their hip's range of motion (flexion and internal rotation), completion of the hip impingement test, and a short demographic survey. Results showed that 25.7% of the participants (N=288) exhibited a clinical positive in decreased hip internal rotation, thus warranting further examination (radiographic) for FAI and 14% reported a prior history of hip/groin pain. Marginal evidence suggests that patients with decreased hip flexion (<115 degrees) or hip internal rotation (<30 degrees) in the left hip sit in an upright or reclined (slouched) position. In conclusion, we found that students who sat in a reclined position during class were indeed likely to have decreased hip function.

Cameron Benjamin Beilke, Luke Pan, Jenna Evelyn Schroeder, Lauren M. Hetzel and Brittany Lynn Kreft (190)

Faculty Mentor/Collaborator: **Gary VanGuilder**

CrossFit Training Improves Sport Performance and Body Composition in Young Healthy Adults

CrossFit training, which includes a variety of exercise training modes (e.g., aerobic endurance training; strength, power, and speed training; and flexibility, agility, balance, and coordination training) merged into a single high-intensity, short-duration workout, has gained significant popularity recently, but there is limited data on its potential health and fitness benefits. Therefore, the purpose of this study was to determine if four weeks of CrossFit training will improve sport performance and body composition in young, healthy adults. Twenty-one moderately fit, young participants are currently being recruited to participate in 14, 30-40 minute CrossFit training sessions over a 4-week time period. Anthropometric (i.e., height, weight, percent body fat) and performance (i.e., speed, power, agility, muscular strength, muscular endurance, and flexibility) will be assessed before and after the 4-week training program. The equipment involved in the training program includes but is not limited to kettlebells, barbells, plates, plyometric boxes, medicine balls, and jump ropes. We hypothesize that four weeks of CrossFit training will significantly improve muscular strength and endurance, measures of speed and power, and various aspects of sport performance in young, healthy adults.

Benjamin James Carlson and Casey Ann Wick (189)

Faculty Mentor/Collaborator: **Gary VanGuilder**

Strong Association of Sagittal Abdominal Diameter with Traditional Variables for Cardiovascular Disease Risk

Sagittal abdominal diameter (SAD) in supine or standing position reflects visceral fat and is associated with cardiovascular disease (CVD) risk. Adding SAD to other common adiposity indexes may provide better CVD prediction. We studied the

association between SAD and other anthropometric and traditional CVD risk variables. Thirty-two subjects (23 female, 9 male; age 19-70) participated. Supine and standing SAD was measured with a square caliper between the iliac crest and the lowest palpable rib, post-exhalation. In subjects age 36+, correlation coefficients were determined between adiposity measures and Framingham score (risk of CVD incident within next 10 yrs). Standing SAD measurements were ~5 cm greater than supine. Supine SAD was higher ($P < 0.05$) in older (24.1 ± 5.3 cm) vs. younger subjects (17.6 ± 2.5 cm). In the older group, both standing and supine SAD significantly correlated with the Framingham score (0.59, 0.54), and had a higher correlation than waist (0.51), body weight (0.47), and body mass index (0.24). In total population SAD more strongly correlated with other risk factors not included in Framingham score. Strength of associations with CVD risk in this study group suggests that SAD compares with other commonly used risk assessment variables, both anthropometric and metabolic.

Shannon Crook, Elizabeth Blixt Erickson, Thomas Robert Groth, Lauren M. Hetzel, Lauren Margaret Lube and Chase Brendan O’Keefe (191)

Faculty Mentor/Collaborator: **Donald L. Bredle**

Increasing Physical Activity in Diabetic Adults via Underwater Treadmill and Aquatic Exercises

Previous research in aquatics has shown a reduction in joint stress due to the buoyancy and thermal properties of water. Since exercise is imperative for limiting the adverse effects of diabetes, there is a need to find exercise modes that will motivate diabetics to engage in regular physical activity. Forty subjects, 64 ± 10 years of age, most sedentary, overweight, and type 2 diabetic, were informed and consented to participate. Our goal was two 30-minute sessions per week for 12 weeks on a Hydroworx™ underwater treadmill. Sessions include a 5 min warm-up, 15 min light to moderate walk or jog, while finishing with resistance exercises, stretching, and hydromassage. Pre-and post-training assessment included height, weight, skinfolds, waist, and hip girth, and survey on energy levels. Clinical variables pre-and post-training included blood pressure, cholesterol, and HbA1C. Twenty-nine of the 40 continued beyond two sessions. To date 14 subjects have completed all 24 sessions, and 15 are expected to finish in the next month. Results thus far have shown increased energy, improved sleep and activities of daily living (ADL’s), and appreciation for this mode of exercise. Though data analysis continues, participants expressed improvement in daily physical function and desire to continue to be active.

Dustin James Englebert, Kevan John Laporte, Nicholas Ryan Hartwigsen and Matthew Charles Krueger (165)

Faculty Mentor/Collaborator: **Robert C. Stow**

The Effects of Soft Tissue Manipulation on the Treatment of Medial Tibial Stress Syndrome in Collegiate Track and Field Athletes

Medial tibial stress syndrome (MTSS), otherwise known as shin splints, is an injury that often occurs in athletes who perform high impact sports - particularly competitive track and field. The goal of this study is to investigate whether the use of soft tissue manipulation is a suitable treatment method for preventing and treating MTSS in collegiate track and field athletes. For this study we will utilize Graston instruments to conduct soft tissue manipulation. Graston instruments are a series of six stainless steel instruments used to amplify lower leg tissue adhesions (knots or trigger points). We are currently recruiting collegiate track and field athletes who have or have had a history of MTSS. The soft tissue manipulation treatment will be performed twice a week for four weeks, using a strict protocol to ensure that everyone receives the same treatment. As healthcare providers, the information we will receive from this study will help dictate future treatment protocols for MTSS. Findings of this research have not been obtained thus far; however, it is hypothesized that the use of Graston instruments will have a positive effect on the prevention of, and rehabilitation of athletes with, MTSS.

Rachel Victoria Ferestad, Chelsea Le Boesel, Brynn Noelle Caslavka, Hannah Jean Gytri and Tiffany Kay Melby (192)

Faculty Mentor/Collaborator: **Jeffrey M. Janot**

The Effects of Myofascial Release and Dynamic Warm-up on Exercise Performance

Fascia, a type of connective tissue that covers your muscles, provides support and structure for the body. Sometimes the fascia tightens up and restricts movement, which may reduce exercise performance. Release of the fascia, termed myofascial release, can be accomplished by using foam rollers or a dynamic warm-up. We are seeking to determine how these methods affect subsequent exercise performance. Accordingly, this study will identify which technique of myofascial release—using foam rollers, dynamic warm-up, or a brief 5 minute jog—has the best impact on speed, power, balance, and fitness in young recreationally active adults. Seventeen (8 male and 9 female) subjects are currently being recruited to participate in three

series of exercise performance tests over the course of two weeks. The performance tests will follow 15 minutes of each warm-up method. The exercise performance tests will include a maximum vertical jump height, laser-timed 40-yd running sprint, 1-mile run, and a standing balance test. We expect to see that the dynamic warm-up will enhance performance results to the greatest extent. This will show us that the dynamic warm-up may benefit those looking to enhance performance in areas of speed, power, balance, and fitness.

Brian John Fox, Joseph Donald Hauser, Benjamin M. Krings and Chase Brendan O’Keefe (188)

Faculty Mentor/Collaborator: **Gary VanGuilder**

Comparing Aquatic Plyometric and Land Plyometric Training on Power and Agility Performance

Plyometric training has been shown to enhance athletic performance in sports that require a high-level of speed, agility, and power. Plyometric training is traditionally performed in a weight room or on a land-based surface, but some evidence indicates that plyometric training underwater may limit the risk of exercise-induced injury without sacrificing performance results. Therefore, the purpose of this study is to compare 4 weeks of aquatic-based plyometric training to a traditional land-based plyometric program with respect to speed, power and agility performance in recreationally active young adults. In an ongoing study, twenty-one subjects (16 males, 5 females) have been randomly assigned to 4 weeks of an identical plyometric training program on land or in an aquatic setting (indoor pool). Exercise performance tests (i.e., vertical jump height, standing broad jump, medicine ball chest pass, agility T-test, 20 yard shuttle, and 40 yard sprint) will be completed before and after plyometric training. The subjects will complete a total of ten, 30-45 minute exercise sessions over the 4-week program. We hypothesize that both programs will yield similar improvements in power and agility; therefore, aquatic plyometrics may be an effective alternative to traditional land-based plyometrics.

Jenna Marie Hersant and Joelle Nicole Noeldner (166)

Faculty Mentor/Collaborator: **Gary VanGuilder**

Metabolic Syndrome Exacerbates Central Arterial Stiffness in HIV-1-Infected Patients Receiving Antiretroviral Treatment but Not in HIV-1 Treatment-Naïve Patients in Tanzania

Metabolic syndrome (MetS), a clustering of cardiovascular risk factors, is becoming increasingly prevalent with HIV-1 in resource-limited settings, and higher rates are observed in HIV-1-infected patients who are undergoing antiretroviral treatment (ART). Increased blood vessel stiffness may contribute to heart disease in HIV-infected patients taking ART. Therefore, the aim of this study was to determine whether blood vessel stiffness is increased in HIV-1-infected patients treated with ART, and if so, whether the presence of MetS exaggerates arterial stiffness in this population. We recruited 42 patients from the Kilimanjaro Christian Medical Center (KCMC) in Moshi, Tanzania: 14 HIV-1-infected not on treatment, 28 HIV-1-infected patients on ART, and 11 healthy controls. Resting blood vessel stiffness was assessed while patients were lying down using standard techniques. Blood vessel stiffness was much higher in the HIV-1-infected patients treated with ART compared with HIV-1 patients not on treatment and control subjects. Interestingly, MetS exacerbated vessel stiffness in HIV-1 ART patients. The presence of the MetS worsens arterial stiffness in HIV-1 patients on ART, a finding that is not observed in HIV-1 patients with MetS who are not on antiretroviral medication. The combined influence of ART with MetS may accelerate the development of cardiovascular disease in HIV-1 patients in sub-Saharan Africa.

Madeline Kay Johnson (169)

Faculty Mentor/Collaborator: **Robert C. Stow**

Do Football Players Have a Greater Risk of Developing a Hip Impingement?

Femoroacetabular impingement (FAI) is caused when the neck of the femur, due to limited internal rotation, biomechanically contacts the pelvis in an atypical manner. The purpose of this study was to investigate if football players at the collegiate level have a higher incidence of FAI than other sports and if specific football positions are more affected. Participants were asked to complete a survey that gathered basic demographic information. The surveyed participants were then given multiple physical assessments including measurement of range of motion (hip internal rotation and flexion) and a hip impingement test. Results showed that 5.9% of football players tested positive for hip impingement, compared to 2.3% of the other sports. Football also showed a significantly ($p < 0.05$) higher rate for clinical positives in decreased hip internal rotation and flexion. In regards to football positions, offensive and defensive line positions were significantly more likely to have decreased hip flexion. Clinically, the use of decreased hip flexion, internal rotation, and/or discomfort with the hip impingement test has been used to diagnose FAI. Our results suggest that playing football, especially on the offensive or defensive line, at linebacker, or safety positions may predispose an individual to developing clinical symptoms of FAI.

Cassandra Laurine Klatt, Casey Lee Albrecht, Michael James Miland, Abby Frances Johnson and Emily Jean Kidd (167)

Faculty Mentor/Collaborator: **Gary VanGuilder**

The Physiological and Training Effects of Whey Protein and Chocolate Milk During a 4-Week Resistance Training Program

Post-resistance training protein supplementation may produce numerous physiological benefits and training adaptations including improved muscular endurance, body composition, and muscle hypertrophy. However, previous studies demonstrate conflicting results related to post-exercise supplementation with whey protein as well as with chocolate milk. The purpose of this study is to compare the effects of whey protein supplementation to chocolate milk on muscular endurance, body composition, and muscle hypertrophy in young adults when combined with 4-weeks of resistance training. Seventeen young, healthy adults (10 women, 7 men) will complete a 4-week upper- and lower-body resistance training program while supplementing their normal diet with a predetermined amount of whey protein or chocolate milk. The supplement will be ingested orally within 30 minutes following each resistance training session for 4-weeks. Muscle hypertrophy, body composition, and measures of muscle endurance (one-minute push-up test, one-minute sit-up test, and a wall-sit to failure) will be measured before and after the resistance training program. Outcomes of this study have not been attained thus far; however, we hypothesize that whey protein supplementation will improve muscle hypertrophy, body composition,

and muscular endurance to a greater extent than supplementation with chocolate milk when combined with four weeks of resistance training in young adults.

Kathleen Ann Pichotta, Alexandra Paige Harris, Abbie Kathleen Shadick, Katherine Jeanette Strand and Courtney Ann Palubicki (164)

Faculty Mentor/Collaborator: **Robert C. Stow**

The Effect of Kinesio Tape on Lower Body Proprioception in the Knee and the Ankle

Proprioception is an important factor in rehabilitation and prevention of injuries. Kinesio tape has been thought to improve many physiological functions of the body and has recently been introduced into the sports medicine field. While there have been studies concerning both topics, little research has been conducted on the effects of Kinesio tape on proprioception. Therefore, the aim of the present study is to determine whether Kinesio tape can improve lower body proprioception, and to evaluate if there are any differential proprioception effects of Kinesio tape between the ankle and knee in healthy young adults. To complete the study we will recruit 15 healthy male or female young adults to participate in a series of six testing sessions which include two baseline testing sessions, and four subsequent tests after the application of the tape to either the ankles or knees. We will utilize the Biodex DS and the Balance Error Scoring System (BESS) test to evaluate the subjects' proprioception. Findings of this study have not been obtained thus far; however, it is hypothesized that kinesio taping will improve lower body proprioception, but will not show varying effects between the ankle and knee.

Sarah Beth Suchla, Brittany Ann Frederick and Courtney Ann Lehman (145)

Faculty Mentor/Collaborator: **Gary VanGuilder**

Cardiovascular Risk Profiles in Firefighters

Cardiovascular disease contributes to 45% of on-duty firefighter fatalities and is the leading cause of on-duty deaths. Moreover, most cardiovascular events occur in firefighters who are stratified to a high risk profile. Thus, it may be unsafe for high risk-firefighters to participate in strenuous emergency duties. The purpose of this study is to determine whether certain specific firefighting tasks cause cardiovascular stress and increase the risks of experiencing a cardiovascular event. For this study we are recruiting 20-25 male firefighters. Initially, we will complete a series of basic health assessments to stratify them into low, moderate, or high cardiovascular risk. Their heart rate responses will be measured by heart rate monitor while performing the Candidate Physical Ability Test (CPAT)—stair-climb, victim drag, and breach and pull tests—as quickly as possible. While the research has not yet been concluded, we hypothesize that the CPAT heart rate responses will be higher than the age-predicted intensity currently considered safe for firefighters with moderate to high risk profiles.

MUSIC AND THEATRE ARTS

Rachel Ann Philipps, Kathryn M. Henderson and Iansa Lucia Zaldarriaga (144)

Faculty Mentor/Collaborator: **Lee Anna Rasar**

Assessment of Short Term Memory for Rhythmic Reproduction in Residents on a Dementia Unit

This project examined the short-term memory skills for rhythmic reproduction in residents on a dementia unit during the summer 2011 semester. Previous work with residents on this dementia unit revealed their ability to replicate rhythm patterns modeled for them. This project is significant because current research on short-term memory for people with dementia has focused on spontaneous rhythmic responses and on the effects of musical stimulation on aspects of cognition, language, and social interaction but not specifically on rhythmic memory. In the current project the residents initially learned the rhythmic patterns and performed them over a four-week period. One student demonstrated rhythm patterns while two other students independently recorded responses of the residents during piano accompaniment provided by the professor on songs familiar to the residents. Rhythms were initially provided with piano accompaniment as introductions for each song. Over time the residents spontaneously demonstrated the rhythmic patterns when hearing the associated songs for specific rhythm patterns. Their performances demonstrated their ability for success in the arena of short-term memory tasks and their retention skills for newly learned material.

NURSING

Teresa Anne Coughlin and Andrea Breanne Olson (162)

Faculty Mentor/Collaborators: **Charlotte K. Sortedahl and Susan D. Moch**

Preceptoring in Rehabilitation Nursing: What are Best Practices?

Long-term retention of new graduate nurses is challenging for many administrators. Preceptors play a crucial role in educating new nurse graduates and are vital in solidifying the confidence and competence for the future practice of graduates. An academic and practice partnership was formed with an acute rehabilitation hospital unit to identify best practices in preceptor guidelines. Nursing students collaborated with the rehabilitation nursing administrator to summarize research studies on preceptoring new graduates. Since limited research was available specific to rehabilitation nursing, more general preceptoring articles were included in the literature review. Findings were shared with unit staff. Nursing students also listened to nursing experiences while shadowing staff including floor nurses, a new graduate and preceptors on the unit. Information obtained from staff discussions and shadowing opportunities was useful in formulating rehabilitation-specific preceptor guidelines. Within the field of nursing, there is a call for change in the preparation of new graduate nurses in specific clinical areas to improve nurse competency, retention and patient outcomes. This project demonstrated a critical need for additional research and knowledge related to quality preceptoring within the complex role of acute rehabilitation nursing.

Jessica Renae Miller and Katie Elizabeth Lochen (171)

Faculty Mentor/Collaborator: **Susan D. Moch**

External Collaborators: **Pam Guthman, LEAP (Linkage Between Education and Practice) Program**

Evidence Based Public Health Practice with Nursing Student Collaboration

Identifying effective means for disseminating best practices in public health nursing and encouraging student interest in public health is essential. Through a university-public health collaboration, meeting both of these goals is possible. Building on the success of a prior project where undergraduate students obtained research evidence for a community agency, this project involves an initiative with the regional public health office, an education practice liaison, and local health departments around evidence-based practice. The goal of this evaluation research is to determine the student and the staff outcomes for the collaboration. Both the evidence-based process and the findings from the evaluation process with students and with staff partners will be described. Through the experience of working with the public health nurses, students found research/evidence on topics such as medication disposal, marijuana use, and chlamydia prevention. Evaluation processes consisted of detailed records of student involvement, requests received, information shared, requests for expert consultation and student evidence summaries. In addition, evaluation from a focus group discussion with regional public health staff and contributing public health nurses will be shared. Summaries of student survey evaluation will also be shared. Future plans and suggestions for more comprehensive outcome evaluation will be included in this poster.

Brooke Ann Mueller, Brittney Legenza and Nicole Jean Soderberg (172)

Faculty Mentor/Collaborators: **Susan D. Moch** and **Cheryl A. Lapp**

External Collaborator: **Becky Harper, Community Health Partnership, Inc.**

Using Evidence to Decrease Hospital Admissions in Chronic Care Management

Decreasing the number of hospital readmissions for persons with chronic conditions is essential for decreasing health care costs. This research focused on synthesizing research evidence and patient information on hospital readmissions to formulate ideas for decreasing hospital admissions. A review of literature on practices to reduce hospital readmission for patients in the areas of general psychiatric, pulmonary, and cardiac chronic illness was conducted. A collection of qualitative and quantitative studies, and meta-analyses were gathered and discussed by the research team. The research was then connected to the Health Field Model and Margaret Newman's nursing theory, which linked social, physical, and genetic environments with pathway of disease. Patient readmission data was analyzed and included in the research and theoretical analysis. Ideas for decreasing hospitalizations were formulated and suggestions were discussed with the collaborating clinical agency. For psychiatric patients, instituting family therapy with inpatient stays and utilizing behavior health specialists within the general units was found. Pulmonary and cardiac patients need to have more time to complete education and medication adherence at discharge, and implementing follow-up care. The outcome stresses the need to strive to focus on the patient, their patterns of health, and how they want to change their lifestyle.

Christine Elizabeth Ostendorf and Allison K. Mentink (186)

Faculty Mentor/Collaborator: **Mary K. Canales**

Connecting the Dots: Integrating Local Food in Western Wisconsin

The Wisconsin Department of Health Services reports that 65% of adults are overweight or obese, which places our population at risk for chronic diseases such as high blood pressure, type 2 diabetes, and cardiovascular disease. Efforts to address the growing obesity epidemic include replacing unhealthy foods with local food products. This study examines the impact of locally-supported agriculture in Western Wisconsin, from perspectives of hospital and school administrators, farmers, food cooperative staff, and restaurateurs. Employing ethnographic research methodology, we conducted 24 individual interviews to identify facilitators, barriers, and lessons learned for integrating local food into larger institutions. To successfully integrate local food, existing barriers such as transportation and distribution, food service contracts, lack of staff involvement, and additional time and effort must be addressed. To overcome these barriers, facilitators such as community support, building and maintaining strong relationships, and commitment throughout the organization need to be enhanced. Valuing of local food is essential for integration to occur. Connections between producers, buyers, and distributors and an understanding of their unique roles are all needed for local food to become part of an organization's menu.

Sarah Lynne Pitts, Brook Alyse Forster and Matthew Clifford Mitchell (163)

Faculty Mentor/Collaborator: **Charlotte K. Sortedahl**

International Online Journal Club for Nurses

Evidence-based nursing practice is essential for positive patient outcomes. However, it can be difficult for nurses to stay up-to-date with the latest research and, in turn, use it to improve their practice. Some research has indicated nursing journal clubs to be an effective way to advance evidence-based practice. Barriers to keeping up with the evidence include difficulty understanding research articles and busy work and personal schedules. It can also be difficult for nurses to meet regularly at a certain time and place for journal club meetings. To accommodate these difficulties, an international synchronous online journal club with 36 school nurses was developed. The purpose of the club was to analyze articles, discuss evidence, and apply findings related to the field. Using Blackboard Collaborate, article authors presented their research. Nurses asked questions of the authors and participated in moderated discussions. To assess journal club effectiveness, participants completed self-report surveys. Nurses' confidence in appraising research and applying evidence to practice will be evaluated. We expect participants' confidence will increase and that they will use the evidence in their nursing practice. The interdisciplinary nursing/computer science team will examine the technological challenges and successes. This project has implications for nursing and practice-based professions.

Lori Marie Pozega and Melissa Ann Goldberg (187)

Faculty Mentor/Collaborator: **Cara M. Gallegos**

Exploration of the Effects of Playing Wii on Children's Health-Related Quality of Life (HRQoL) During Hospitalization

Medical research advances result in increased survival of children with chronic conditions, specifically pediatric oncology and cystic fibrosis (CF). Health-related quality of life (HRQoL) is a multidimensional construct encompassing 4 domains: physical functioning and symptoms, functional status, psychological functioning, and social functioning. There is very little research as to effects of Wii gaming on HRQoL for children hospitalized for extended time periods. This study explores the impact Wii gaming has on a child's HRQoL for hospitalized patients diagnosed with CF and/or hematology/oncology related conditions. A convenience sample resulted in a sample size of 6 mothers and 6 children. The Pediatric Quality of Life Inventory (PedsQL) 4.0 was used to measure child and parent perceptions of HRQoL and PedsQL Multidimensional Fatigue Scale was used to measure child and parent perceptions of fatigue in pediatric patients. A pre- and post-test was given to the child to complete when playing Wii. Descriptive statistics were calculated for demographic variables of parent, child, HRQoL (PedsQL 4.0) and fatigue (Peds QL Multidimensional Fatigue) scores. Children hospitalized frequently and/or for lengthy time periods experience decreased HRQoL. Preliminary analysis indicates children enjoy Wii gaming during hospitalization. Activities that encourage normalization are recommended during hospitalizations.

Laurelyn Elise Wieseman, Anja Feibel Meerwald and Rachel Rae Nerison (170)

Faculty Mentor/Collaborators: **Lee-Ellen C. Kirkhorn** and **Catherine M. Berry**

Obesity and Type II Diabetes Mellitus in Chinese Middle-School Students

Working collaboratively with Chinese nurses and two UW-EC nursing faculty, three undergraduate students visited China in summer 2011. Their work emphasized primary prevention of Type 2 diabetes mellitus. China was once considered to have one of the leanest populations, but it is fast catching up with the West in terms of the prevalence of overweight and obesity; disturbingly, this transition has occurred in a remarkably short time. More than 200 students from two economically and socially diverse middle schools in China were enrolled in a three-week nutrition and exercise program that included structured information about balanced diet and regular physical activity. Chinese students were surveyed using an instrument focused upon nutrition and exercise practices, electronic screen time, and BMI before and after the intervention. Investigators included the UW-EC group and Chinese nurses from the First Affiliated Hospital of Jinan University- Guangzhou, China. Descriptive data collected from the two middle schools and inter-correlations among the study variables of BMI, screen time, self-appraisal of exercise and eating habits will be presented in the analysis. The experience of conducting inter-cultural research with Chinese middle school students, RNs, and translators will be addressed as well as strengths and limitations of the design.

SOCIAL WORK

Leah Kathryn Davis, Justin William Mabin, Sarah Mae Davey and Kelsey Mae Williams (141)

Faculty Mentor/Collaborators: **Lisa Quinn-Lee** and **Susan D. Moch**

Use of Oxygen at End-of-Life: On What Basis Are Decisions Made?

Conducting and discussing research on end-of-life care is often difficult; however, it is important to address the topics that surround death and end-of-life decisions to accommodate patient and family desires. Palliative oxygen therapy for the management of breathlessness remains controversial and little information is available in regards to the practice of using oxygen at end-of-life. The goal of our literature review is to stimulate thoughtful reflection and encourage conversation related to the scientific findings that oxygen may not be necessary at end-of-life. In fact, oxygen use may prolong death for those wanting to die. A literature review was composed from a combination of information in palliative care practice and literature. In our review, we question if the practice of oxygen use at end-of-life is based on science, on attitudes and beliefs of health care practitioners and families, or unquestioned institutional policies. The purpose of this review is to identify areas of research needed on this topic. Based on outcomes of this review, we plan to conduct a formal survey of palliative care units in Wisconsin to understand what policies exist for oxygen use at the end-of-life, why these protocols are in place, and what quality of life means for patients.

WATERSHED INSTITUTE FOR COLLABORATIVE ENVIRONMENTAL STUDIES

Amanda J. Mortensen (95)

Faculty Mentor/Collaborator: **Karen G. Mumford**

Campus-wide Healthy Eating Assessment

A survey—one of the first healthy eating studies to examine all members of a college campus—was conducted of students, faculty, and staff at a small Midwestern college to examine and compare healthy eating behaviors and perceptions. The survey's purpose was to identify the factors that hinder or promote healthy eating among campus members. Survey questions were disseminated electronically to the campus email addresses of students, faculty and staff. Of the 441 valid respondents, 67% were students, 22% were professional administrative or staff, and 11% were faculty. Preliminary analysis indicates that significant differences exist between students, staff, and faculty regarding the barriers to healthy eating as well as policy preferences on how to encourage better eating habits. Findings from this study indicate that a variety of strategies need to be implemented to improve healthy eating among all campus members.

HUMANITIES

AMERICAN INDIAN STUDIES

Robert Allen Bell (278)

Faculty Mentor/Collaborators: **Debra K. S. Barker** and **Lawrence T. Martin**

Giacomo Beltrami: An "Accidental Tourist" in Minnesota

The purpose of this research project is to identify the American Indian artifacts that Giacomo Beltrami collected while travelling in Minnesota to find the Mississippi River's source during 1823. The first objective of this project was to identify the American Indian artifacts that Beltrami collected in the Red Lake, Leech Lake, and White Earth Reservation areas of Minnesota. After identifying the artifacts, we tried to determine where he collected these artifacts, using the journals and diary that Beltrami kept on this journey. The project's second phase attempted to explain why Beltrami originally came to the United States. A lawyer, Beltrami was a political refugee from Italy. Beltrami became an explorer in Minnesota due to his fascination with American Indians and his desire to know more about them. Giacomo Beltrami became an "Accidental Tourist" in Minnesota during his three-month adventure and collected a variety of interesting Sioux and Ojibwe artifacts while "visiting" Minnesota.

Lisa Ann Chase (22)

Faculty Mentor/Collaborator: **Heather Ann Moody**

Restructuring a Myth: Economic Impact of Casinos in the Chippewa Valley

In 1988 United States Congress passed the Indian Gaming Regulatory Act, which made gaming possible. This act would be monumental in helping the Native American tribes throughout the United States financially. It would not be until 1992 that the St. Croix Band of Chippewa Indians would open the door to their first casino in Turtle Lake, Wisconsin. This paper will help fill in the gaps of missing economic literature of Wisconsin St. Croix tribe. Another thing that this paper does is looks at the positive economic impacts on the St. Croix Casino Turtle Lake on the Village of Turtle Lake and the St. Croix reservation. Examining the economic impact of the St. Croix Casino dispel any stereotypes dealing with the "rich" Indians as well as inform the general populations about casinos.

Jenna Kathleen Vater (21)

Faculty Mentor/Collaborator: **Heather Ann Moody**

Two Pairs of Shoes, a Bed, and Food: Wisconsin American Indian Women in the Military During World War II

During World War II approximately 800 Native women served in the United States military. They joined for various reasons, from feelings of patriotism to a desire for adventure and education. Pay was another incentive. Poverty was as prominent in Indian Country then as it is today, so the possibility of having a stable job with a steady income drew many Native women into the military. Once in the service, Native women held jobs varying from transcribing Japanese messages in international code to serving as a nurse in New Guinea. Discrimination was generally not a problem for Native women in the military. Many people assumed that Native women were Hispanic, Asian, or even Greek, but most Native women did not face

discrimination while in the service. This paper follows the experiences of four Wisconsin Indian women and their service in the military during World War II. All came from different backgrounds and held different jobs in the service, but they all display common themes. In this paper the themes are either fitted into national patterns of women's experiences throughout the country or are interpreted to display how Native Wisconsin women's experiences differed from other women.

ENGLISH

Andrea Lynn Galloway (233)

Faculty Mentor/Collaborator: **Stephanie S. Turner**

What's in a Label? Analyzing the Public Response to Labeling Genetically Engineered Salmon

Although Americans have been eating foods containing genetically modified plants for more than 15 years, only within the last two years has a genetically modified food animal been developed. The imminent FDA approval of the AquAdvantage salmon, an Atlantic salmon containing growth-promoting genes from the Chinook salmon (*Oncorhynchus tshawytscha*) and the ocean pout (*Zoarces americanus*), presented Americans with their first opportunity to express their views about eating genetically modified animals. In this project we carried out a content analysis of the public commentary on the FDA's proposed guidelines for labeling food items derived from the AquAdvantage salmon. Using a grounded theory method and NVivo qualitative content analysis software, we identified and coded common themes in more than 400 individually submitted comments and a public hearing transcript. Although we hypothesized that a majority of the coding would focus on the labeling issue, in fact, only 1% of the coding pertained to this issue, while 13% of the coded content addressed human and environmental safety issues. Another finding was that 2% of the coded content compared the risks of eating genetically modified salmon with other biotechnology-related risks. These findings contribute to the research on risk perception in the public understanding of science.

Charlotte R. Kupsh (211)

Faculty Mentor/Collaborator: **Jan C. Stirm**

The Sibling Relationship in 15th-17th Century Revenge Tragedies

The research project focuses on investigating trends in sibling relationships in 15th-17th century revenge tragedy dramas. The revenge tragedy has been a popular subject of drama and literature since Seneca's time and has been researched extensively; however, little significant research has been conducted on sibling relationships. Beginning with a base in Shakespeare's *Hamlet*, approximately twenty-five plays from the surrounding time period were studied, six of which became the direct focus of the research. Without referring to outside literary criticism, the six plays were analyzed in-depth in order to find patterns in familial relationships. The research pointed to a distinct plot pattern in the way the brother-sister relationship developed over the course of the play, with specific emphasis on the sister's romantic interactions. In this type of revenge tragedy, there exists an extreme relationship between the brother and his sister's suitor – for differing reasons, in each play the brother either murders the suitor or gives his life to protect the relationship between the sister and her suitor.

Kia Thao (218)

Faculty Mentor/Collaborator: **Lynsey K. Wolter**

Phonetics of the White Hmong Language

The main goal of this research project is to look at the Hmong White language of the Eau Claire area. With the language, I hope to analyze changes in pronunciation as a result of the community's shift to the English language. Also with the language, I hope to develop a system to teach the Hmong White language. This research is significant because in the Eau Claire community, many Hmong people are losing their native language, and learning the sounds is a bit challenging since Hmong is a tonal language. The methods that I used started with books, dictionary, and professors, to come up with the idea of using flashcards to get the sounds of each letter of the alphabet. Then I developed some questions and with the use of the phonetics program PRAAT, recorded the participants' pronunciation of the words. I expect to report an IPA (International Phonetic Alphabet) chart with the sounds of the Hmong White language in the Eau Claire area.

FOREIGN LANGUAGES

Ashley Marie Butler (235)

Faculty Mentor/Collaborator: **Pauline E. Basurto**

Green Bay, Wisconsin: FLES Programs and the Business Community. Is There a Connection?

In Green Bay, Wisconsin, elementary schools offer foreign languages or FLES programs in French, German and Spanish. The school the student attends determines the language the student will learn in grades K-5. Early foreign language training plays a vital role in student choice to continue foreign language study in middle school and beyond. An influx of Mexican and Central American immigrants to the Midwest has launched Spanish into common usage in the Green Bay business community. Should second language acquisition be mandated in K-5 schools in order to prepare students for the workplace? Do FLES programs assist Spanish-speaking students in obtaining jobs in Green Bay, Wisconsin? The study surveyed students and teachers of Spanish in grades 3-12 at public schools in Green Bay. Teachers were asked qualitative questions about second-language acquisition. Business professionals from the Green Bay area were interviewed to determine if bilingual applicants were viewed more favorably than monolinguals. Results suggest a link between Spanish-language acquisition in grades K-5 and continued foreign language study choices in middle school, high school, and college. The earlier the student starts to learn Spanish, the more likely they are to continue study. The results from business surveys were inconclusive.

HISTORY

Craig Harvey Ferries (234)

Faculty Mentor/Collaborator: **Selika M. Ducksworth-Lawton**

The March from Selma to Montgomery: A Change in the Philosophy of the Civil Rights Movement

The march from Selma to Montgomery in 1965 was the opening battle to determine whether the message of the mainstream civil rights movement would be nonviolence or armed self-defense. Members of the Student Non-Violent Coordinating Committee attacked the Reverend Martin Luther King's message of non-violence in 1964 and more aggressively in 1965. Stokely Carmichael and his followers believed that King's non-violent approach was not sustainable and that it endangered their ultimate goals. The armed self-defense philosophy has a long history in African American history; it was just overshadowed by the philosophy of love and nonviolence in the historical record. While the nonviolent philosophy had a steady record of accomplishments, they did not come without a price: unlawful arrests, rotations in and out of jail, beatings, and murder. By 1964, local activists began to question non-violent philosophy in Mississippi; but the emerging challenge to non-violence was most visible in Selma, Alabama in February 1965. This research project focuses on the clash of philosophies: nonviolence versus self-defense in Selma in 1965, and the impact of that clash. It argues that this philosophical question led to the division of the mainstream civil rights movement, thereby changing the course of the civil rights movement following the third march from Selma to Montgomery in 1965.

Kelly John Herold and Kathleen M. Borowski (220)

Faculty Mentor/Collaborator: **John W. W. Mann**

Randall Park History and Architecture Survey

We are presenting research that will be used to help the City of Eau Claire identify historic structures within the city limits, as they are required to do for planning purposes. This project is a great example of historical research being used in a public setting, in this case city government, to bring awareness of the historical significance or lack thereof to a specific place or area. Students of Dr. Mann's Introduction to Public History class completed the research of individual properties through the use of primary and secondary sources to identify the date of construction of homes as well as the owners and tenants of homes in the Randall Park neighborhood of Eau Claire, WI. Our plan is to submit a compilation of the research to the City of Eau Claire as well as the State of Wisconsin's Historic Preservation Office. We will be presenting a condensed version of the report on the poster showing how the Randall Park neighborhood was formed and what historical factors shaped the neighborhood over its history.

Desirae Jo Lezotte (242)

Faculty Mentor/Collaborators: **Jane M. Pederson and Patricia R. Turner**

Eugenically Speaking: Cora Anderson and the 1913 Wisconsin "Eugenic" Marriage Law

Cora Anderson, a Potawatomie-Cherokee and African American female from Kendallville, Indiana, effectively passed as Ralph Kerwinieo, a South American man ten years her junior, intermittently for thirteen years in Milwaukee, Wisconsin.

During that time, Anderson obtained a male's certificate of health as required by a 1913 law to marry her second wife, Dorothy Kleinowski. The eugenic movement inspired the 1913 Wisconsin marriage law, which became a model for similar laws throughout the United States. It was ostensibly designed to prevent the spread of sexually transmitted diseases; while it failed to achieve this goal, it did have the unintended consequence of reducing the number of new monogamous marriages in the state. This project utilizes an array of primary sources—including state legal codes, United States federal census records, cemetery records, Milwaukee city directories, and contemporary newspaper accounts – to illuminate the Cora Anderson case and its impact on social legislation during the Progressive Era. It argues that Anderson's sensationalized case revealed cultural assumptions about sex and gender inherent in the contentious 1913 Wisconsin Marriage law and ultimately forced changes to the law in 1915.

Cady Megan Meschke and Caitlyn Jessica Berlin (258)

Faculty Mentor/Collaborator: **Teresa M. Sanislo**

Jewish Salon Women in Berlin: A Public History

This project analyzed representations of late eighteenth-century Jewish Salon women through contemporary public history venues in Berlin. Jewish women played a unique role in German history, hosting salons in their homes that drew Christian and Jewish, nobles and non-noble elites and intellectuals. They were famous in their own time and throughout the nineteenth century. In order to access the extent to which Jewish Salon women are also part of the landscape of memory in Berlin, we searched for and analyzed representations of these women in guide books, museum exhibits, and historical sites. Although a feminist tourist company in Berlin devotes a great deal of time to recounting the stories and significance of these women, they target primarily a German-speaking public. Representations of Jewish Salon women can be found in Berlin, but one must look hard to find them. Their stories are not always front and center in representations of even the German Jewish past. Additional work is required to make the stories of these women more visible to an English speaking public. This project was conducted in Berlin in 2011 during a faculty-led summer study abroad program in Central Europe. The project will inform sections of Dr. Sanislo's book manuscript, *Gendering the European Tour*.

Cady Megan Meschke and Caitlyn Jessica Berlin (259)

Faculty Mentor/Collaborator: **Teresa M. Sanislo**

Women in East Germany: A Public History

Our research investigates the role gender has played in the history of the European "Grand Tour" and the role that it continues to play in the shaping of contemporary practices of touring European countries. Historians and scholars of German literature and cultural studies have produced countless studies of women's history and gender history of East Germany since the fall of the Berlin wall, but has this work influenced the tourism industry? We looked at representations of gender and women's history in tour guides, museums and historic sites in Berlin, and focused primarily on the DDR museum and Christa Wolf's House in Berlin. We also interviewed a tourist agency to see whether they included these stories in their tours of the city. While historical objects were included in the DDR museum that related to women's history, no explicit narratives were presented to enlighten the public of the role gender played in East Germany. Christa Wolf's House is a state museum, but it is located on the edge of the city and does not offer any English speaking materials or guides for the public. More work is needed to make the stories of gender and women's history in East Germany more visible to an English-speaking tourist public.

Nicholas Michael Pelant (244)

Faculty Mentor/Collaborators: **Patricia R. Turner, Selika M. Ducksworth-Lawton and Jonathan W. Trutor**

Hidden Discrimination: Edwin Wilber and Stereotypes of the Native American Soldier

Racial assumptions have been made regarding Native American soldiers for hundreds of years. This project delves into the military career of one man, Edwin J. Wilber, a Native American soldier during the Korean War. It argues that the United States military made race-based assumptions about Wilber's military abilities, including assumptions that he had an innate, biological ability to understand foreign terrain. Wilber survived the conflict, but many Native Americans did not, as they were often placed on the front lines because of their assumed ability to read terrain. This project uses a variety of archival sources, including United States census data and military casualty records, but also relies heavily on oral interviews with Edwin J. Wilber.

Michaela Kay Walters (243)

Faculty Mentor/Collaborator: **Patricia R. Turner**

Cyrus the Younger: Death in Vain?

Cyrus the Younger's quest for the crown of the Persian Empire, held by his brother, Artaxerxes II, culminated in the Battle of Cunaxa in 401 BC. The battle ended with his own death. The question remains: If Cyrus the Younger had lived through this battle could he have succeeded in supplanting his brother as King? Using primary sources such as Plutarch and the Greek philosopher and historian Xenophon, this paper argues that Cyrus would not have succeeded in the end for two reasons. The first reason that caused Cyrus to fail in his attempted coup was the fact that he made extensive preparations. Normally this would be seen as an advantage to Cyrus; however, these preparations did not go unseen by his brother, Artaxerxes II. This allowed Artaxerxes II to make excellent plans, in advance, to thwart his brother's assault. The second reason Cyrus would have failed was the fact that he had a very fragile support system. His mission to win the throne was doomed in the long term because of his inability to gain powerful and influential allies. These reasons would have led to Cyrus the Younger's eventual demise even if he had survived the Battle of Cunaxa.

MUSIC AND THEATRE ARTS

Tyler Anderson (277)

Faculty Mentor/Collaborator: **Ryan P. Jones**

Tracing the Footsteps of Swing Legends: Tommy Dorsey & Jo Stafford, 1939-1941

This project will research and evaluate the current body of scholarship concerning rock music history. It will examine this scholarship and divide it into the categories of reception, criticism, and analysis. This survey will result in the creation of a formal secondary source bibliography which will be included as an appendix in my faculty mentor's forthcoming book from Scarecrow Press, *The Historical Dictionary of Rock and Pop*.

PHILOSOPHY/RELIGIOUS STUDIES

Heather Rose Buhr (219)

Faculty Mentor/Collaborator: **Kristin P. Schaupp**

Diotima's Dismissal: Sound Argument or Unwarranted Phallacy?

Today's philosophy canon is dominated by male authors, and yet there have been a number of female philosophers throughout history. In fact, one of Plato's dialogues even contains a speech where Socrates recalls teachings he claims are from Diotima, a priestess from Mantinea. However, Diotima's historical status tends to be dismissed by most philosophy literature. Our project poses the question whether Diotima's fictional status is the result of evidence and sound argumentation or fallacious reasoning. We look at both sides of the question, hoping to shed some light on the truth of the matter. After surveying the literature focused on Diotima, we noticed a large number of articles left the reader with the assumption that Diotima was fictional, and yet failed to provide evidence to support the claim or even acknowledge both sides of the argument. Not only do these practices fail to meet disciplinary standards, but they provide a partial answer to rising questions about why female philosophers are struggling to have their voices heard and what can be done about it.

WOMEN'S STUDIES

Betty Nikia, Tuesday Marie Wustrack and Catherine Nicole Emmanuelle (210)

Faculty Mentor/Collaborator: **Theresa D. Kemp**

Feminist Editing: Another One of the "Master's Tools"? Or Can It Transform the Academy?

Drawing on our experiences as inter-disciplinary Women's Studies students, we presented at a roundtable discussion for the National Women's Studies Association in November 2011. We worked with teachers and long-time editors of the journal *Feminist Teacher* (FT) and took a course titled "Editing FT Practicum." Our roundtable discussion at the conference explored what it meant to practice explicitly feminist editing (as opposed to the work of an editor who happens to be a feminist). In what ways do methods of antiracist and feminist activism conflict with and/or inform our practices as editors, writers, and teachers? To what extent can feminist editing as a means of transmitting knowledge foster feminist transformation?

Kelsey Rae Switters, Liana Marie Frey, Ann Christine Gleason, Nichole Rae Johnson, Jenna Kae Laube and Crystal Marie Schmitt (209)

Faculty Mentor/Collaborator: **Theresa D. Kemp**

Sex Work Prevalence in the Greater Chippewa Valley

Our aim is to find out the prevalence of different types of sex work and prostitution in the Eau Claire area, and to address the prevention possibilities for HIV/AIDS. The AIDS Resource Center of Wisconsin (ARCW) currently has little to no information on sex work in the Eau Claire area; because of this they have been unable to address their needs in relation to their outreach and prevention services. Empirical evidence of sex work in the area will help ARCW be able to apply for funding for prevention work. We accumulated preliminary information based on public data, police records, literature reviews, and interviews with county and non-profit officials. Our research sets the foundation for further research by future Women's Capstone students working with ARCW. We are also creating an annotated bibliography which will help develop the methodology for future research on this project. We have begun to establish alliances with community partners and agencies to maintain and further develop these working relationships. This is the first part in an ongoing project between the Women's Studies Program and the ARCW.

NATURAL & PHYSICAL SCIENCES

CHEMICAL SCIENCE

CHEMISTRY

Katherine Mary Anderson and Enkhtuul Tsogtbaatar (205)

Faculty Mentor/Collaborator: **David E. Lewis**

Chemistry of Bridged Vitamin K Model Compounds

Warfarin (Coumadin) has been in extensive clinical use since 1954. Although widely prescribed, warfarin is associated with a high incidence of adverse drug events (ADEs). In 2009, two vitamin K analogues (UWEC-K1 and UWEC-K2) that can potentially act as a warfarin agonist were discovered. In order to explain this observation in rat models, we have attempted to obtain warfarin-UWEC-K1 and warfarin-UWEC-K2 conjugates through a series of nucleophilic substitution reactions. As a result of unsuccessful attempts to obtain a warfarin conjugate, we now propose that UWEC-K1 and UWEC-K2 may undergo several hydrolysis and oxidation reactions before reaching the liver.

Thomas George Bartholow (249)

Faculty Mentor/Collaborator: **Sudeep Bhattacharyay**

Computing Redox Potentials of Type-1 Copper Sites Using Combined Quantum Mechanical/Molecular Mechanical Method

Type-1 copper proteins, commonly known as blue-copper proteins, represent an important class of oxidoreductases, where the redox active moiety is a copper ion bound in a nitrogen-sulfur donor environment. These proteins act as mediators in electron transport with the copper center shuttling electrons between Cu(II)-Cu(I) oxidation states. One critical element of the redox chemistry of type-1 copper sites is the display of a large variation (between 200 -1000 mV) in the Cu(I/II) redox potential, which translates into a Gibbs free energy difference of 18 kcal/mol. The cause of this large variation is unclear and only speculated to be due to active site hydrophobicity, axial ligation, and outer sphere coordination. In order to gain an insight into the role of the protein matrix on the redox potentials of the copper center, we are using combined quantum mechanical/molecular mechanical simulations. The copper center and the atoms within its primary coordination sphere are treated with density functional theory, while embedded in a molecular mechanically treated region. Results of these studies on smaller model systems as well as type-I proteins will be presented.

Danielle Anne Bronshteyn and Adam Christopher Schneider (155)

Faculty Mentor/Collaborator: **James E. Boulter**

New Analytical Method for Identifying Atmospheric Carbonyls Using HPLC-TOF/MS

Carbonyls are a form of oxidized hydrocarbon that feature a carbon-oxygen double bond. They are monitored for clean air standards because of their contribution to particulate and smog chemistry. The derivatizing agent 2,4-dinitrophenylhydrazine (DNPH) has long been used to measure carbonyl compounds in the atmosphere. This method has difficulty distinguishing interferences from analyte, particularly for high-molecular weight analytes, reducing its usefulness. Whereas the old method used high performance liquid chromatography with ultraviolet and visible detection (HPLC-UV/Vis), we used a more sophisticated HPLC that uses a time-of-flight mass spectrometer (HPLC-TOF/MS). The requirements of this instrument place several constraints on the selection of alternative derivatizing agents. They have to be easily ionizable in order to be detected by the TOF/MS, but cannot be inherently charged for good chromatographic separation. They also must possess a large non-polar functional group to keep the analyte at the surface of the droplets being ionized. We have found two derivatizing agents that are suited to this analysis, tosylhydrazine (TSH) and dansylhydrazine (DNSH), and we developed qualitative HPLC-TOF/MS methods for both of them. We have been able to identify carbonyls from a mixture using both of these methods.

Amanda Rae Buchberger (179)

Faculty Mentor/Collaborator: **James A. Phillips**

Effect of Bulk Condensed-Phase Environments on the Structural Properties of FCH_2CN-BF_3 and $ClCH_2CN-BF_3$

We are interested in the degree to which bulk, condensed-phase environments affect the structural properties of FCH_2CN-BF_3 and $ClCH_2CN-BF_3$. Typically, molecular structure is viewed as an immutable property and thus largely unaffected by a solvent, let alone a solid sample of noble gas. We have measured the infrared spectra of both complexes, F and Cl, in solid neon, and experiments in solid argon are in progress. In addition, we have modeled the reaction coordinate of these complexes, which gives direct insight into the underlying physical mechanism for these changes. The data we will present will clearly illustrate that these complexes undergo significant structural changes in the most inert bulk, condensed-phase environments.

Erick Jeffrey Carlson (224)

Faculty Mentor/Collaborator: **Bart J. Dahl**

Synthesis and Study of Methoxy-Donor/Cyano-Acceptor Biphenyl and Terphenyl Lactones

The goal of this project is to explore donor-acceptor biaryl compounds capable of dihedral angle modification through a reversible lactone bridge. These compounds can exist in two states: open and planar. In the open state, π -orbital overlap is minimal due to an increased dihedral angle leading to attenuated communication between the rings. However, the substantial π -orbital overlap when the tether is closed considerably enhances some physical properties including higher conductance, quantum yield and UV-vis absorption. Thus, an efficient switching mechanism must be implemented to survey these changes. The compounds studied switch conformation based on the pH of the environment. The open conformation prevails at alkaline pH, while the closed conformation dominates at acidic pH. As follows, the goals of the research described hereafter are three fold: (1) The novel synthesis and characterization of the ring-closed donor-acceptor compound, (2) the determination of the efficacy of pH as a means to switch between the two conformations, and (3) the detection of a unique UV-vis and/or fluorescence signal associated with each state.

Samuel Joseph Danforth (180)

Faculty Mentor/Collaborator: **James A. Phillips**

Cooperative Effects in the Mechanism of Friedel-Crafts Reactions

Reactions that form carbon-carbon bonds are key to essentially all processes that transform chemical feedstocks into specialty chemicals and consumer products. One of the most fundamental of these is the Friedel-Crafts reaction. Our specific interest is the reaction between an organo-fluoride compound (e.g. $CH_3CH_2CH_2F$) and boron trifluoride (BF_3). It has been presumed that the first step in this process removes a fluoride, rendering a carbon fragment with a positive charge (e.g. $CH_3CH_2CH_2^+$, a "carbocation"). Our work confirms that ions do form, but questions the presumption that this process involves a single organo-fluoride unit, and that the positive ion is a simple carbocation. We previously showed that such a pathway requires an unusual amount of energy, even in electrical charge stabilizing solvents. We now turn to analogous pathways involving additional organo-fluoride units, which according to our current results promotes the removal of the fluorine atom from the carbon chain, and lowers the energy needed to complete this key first reaction step. Our work involves computer modeling

of the structural and energetic properties of clusters involving a BF_3 molecule with additional organo-fluoride units, which may play a key-stabilizing role.

Dexter Cameron Davis (176)

Faculty Mentor/Collaborators: **David E. Lewis** and **Stephen Drucker**

Towards the Synthesis of Specifically Deuterated Cyclohexenones

A variety of synthetic pathways are being explored for the purpose of creating specifically deuterated derivatives of the organic molecule cyclohexenone. By replacing specific hydrogen atoms on the cyclohexenone ring with deuterium atoms (a stable isotope of hydrogen with twice the nuclear mass), the vibrational energy levels of those bonds will change, and these changes can be examined through spectroscopic techniques such as laser excitation. Several different synthetic pathways utilizing a wide variety of techniques in synthetic organic chemistry have been explored for the purpose of creating these molecules. This project has the dual purpose of exploring synthetic strategies towards creating these cyclohexenone derivatives, and using those molecules to better understand the vibrational energy levels of cyclohexenone. This information will allow computational chemistry involving cyclohexenone to proceed with greater accuracy and lead to more useful results.

Tim James Deckers (200)

Faculty Mentor/Collaborator: **Christine M. Morales**

A Computational Study of Ligand Effects on M-H Bonds in First Row Transition Metal Hydrides

Transition metal hydride complexes are used as catalysts and in hydrogen storage materials. The present study examines how coordinated ligands affect the nature of metal-hydrogen bonding in complexes of the form LCuH , LNiH_2 , L_2NiH_2 , LCoH_3 , L_2CoH_3 , and L_3CoH_3 , with coordinated ligands $\text{L} = \text{NH}_3$, NH_2CH_3 , $\text{NH}(\text{CH}_3)_2$, $\text{N}(\text{CH}_3)_3$, SiH_3OH , CO , CH_3CN , C_2NO_4 , $\text{C}(\text{H})\text{CH}_2\text{OH}$, $\text{C}(\text{CH}_3)\text{OH}$, and 1,3-bis(2,4,6-trimethylphenyl)imidazole. Equilibrium geometries, vibrational frequencies, and other properties have been calculated using density functional theory (B3LYP/LANL2DZ). From the equilibrium geometries, the position of M-L bonds have been varied in increments of 0.025 \AA and the orientations in increments of 5° . Preliminary results show that several properties of individual M-H bonds are systematically related to their position and orientation relative to coordinated ligands, as well as to the nature of the metal-ligand interaction. These relationships will be interpreted in light of calculated Natural Bond Orbital (NBO) descriptions of the bonding in these complexes.

Megan M. Dudek (178)

Faculty Mentor/Collaborator: **Thao Yang**

Anti-Oxidant Activities of Purple Colored Fruit Extracts

In this work we tested the antioxidant activity of extracts from highly purple colored fruits, such as pomegranate, blueberry, purple corn, purple potato, etc. The research is to investigate to see if the purple colored substance, which contained variety of anthocyanin compounds plus other unknown compounds, would have antioxidant properties. The goal is to identify natural compounds that are potent antioxidants. We use the compound 2,2-diphenyl-1-picrylhydrazyl (DPPH), which is a stable free radical, as an oxidant to assess the antioxidant properties of the extracts. The parameter IC_{50} of each extract is used to compare the antioxidant activity of the extracts to those of known antioxidants, such as vitamin C and alpha-tocopherol. We expected to see more antioxidant activity with a deeper purple colored fruit. After testing six fruits the two with the highest antioxidant activity were pomegranate and black rice while the two lowest were purple corn and pokeweed berries.

Rachel Ellen Egdorf (204)

Faculty Mentor/Collaborator: **Roslyn M. Theisen**

Synthesis and Characterization of Model Complexes for the Dioxygenase Metalloenzymes

Our goal is to understand more about the active sites and catalytic mechanism of Cysteine Dioxygenase and Quercetin Dioxygenase, which are both important dioxygenase enzymes. Dioxygenase enzymes catalyze critical reactions in the body and the environment. Our research involves synthesis, and structural and electronic characterization of model molecules that have one or more significant properties of a metalloenzyme active site. The aim of this work is to synthesize Iron (II) Salen and Nickel (II) Salen coordination complexes and characterize them by using UV/Vis Spectroscopy, Nuclear Magnetic Resonance Spectroscopy and Mass Spectrometry. Reactivity studies with Cysteine and Quercetin will be explored.

Dustin Fredrickson and Ivan Salazar (247)Faculty Mentor/Collaborator: **Kurt N. Wiegel***Supramolecular Main-Chain Liquid Crystalline Polymers and Networks with Competitive Hydrogen Bonding: A Study of Rigid Networking Agents in Systems with Competitive Hydrogen Bonding*

A set of supramolecular liquid crystalline networks and polymers are synthesized and analyzed utilizing non-mesogenic rigid polyfunctional networking agents in tetra, tri and bi functionalities. Networks formed eliminated nematic phases in concentrations of 62.5%, 55% and 57.5% loadings respectively. Smectic phases were observed in inclusions of 10%, 5% and 15% respectively. It is believed that the increased rigidity of the networking agents allows liquid crystalline phases to form at higher concentrations than would normally be expected. Additionally, the presence of the smectic phase at 15% inclusion of the 2SBZ would seem to indicate the bi-functionalized species assists in the formation of the more complex, layered mesogenic phase.

Cheng Her (177)Faculty Mentor/Collaborator: **Thao Yang***Antibody Binding Study of Mucin Peptide Epitopes*

Tumor cells of epithelial lineage express a glycosylated protein known as MUC1 mucin that differs significantly from that of its normal counterpart. Tumor mucin contains reduced carbohydrate chains that induce an immunological response. In this study we investigated to see whether or not a shortened mucin peptide epitope and substituted mucin peptides will still be recognized by a specific antibody. Results showed that the mucin-specific monoclonal antibody has some affinity to a mutant peptide having the proline residue substituted for phenylalanine, but not aspartate. The data showed that the shortened version of the native mucin peptide epitope still is recognized by the Muc1 specific monoclonal antibody. The epitope interactions observed by STD-NMR occurred mainly at the methyl groups and side chain of the proline residue.

Eric L. Janssen (143)Faculty Mentor/Collaborator: **Kurt N. Wiegel***Supramolecular Main-Chain Liquid Crystalline Polymers and Networks with Competitive Hydrogen Bonding: A Study of Cinnamic Acid Hydrogen Bond Donors*

Supramolecular liquid crystalline networks and polymers will be synthesized utilizing a flexible biscinnamic acid group as the hydrogen bond donor and a mix of hydrogen bond acceptors: a small rigid bipyridyl capable of forming a mesophase when hydrogen bonded and a series of rigid poly-pyridyls that serve as liquid crystalline disruptors. Mesophase stability will be studied as the concentration of crosslinking (the amount of non-mesogenic polypyridyl groups) increases with respect to the rigid species. In similar studies, it was found that the functionality of the polypyridyl species played a significant role in the clearing composition of the networks. A similar result is expected here. The extended rigidity of the acid groups provided by the alkene of the cinnamate could increase the clearing temperatures and ultimately the clearing compositions of the networks.

Jason Van Jorstad (201)Faculty Mentor/Collaborator: **Christine M. Morales***Finding Appropriate Methods to Calculate Metal and Metal Hydride XPS Spectra*

The goal of this project is to evaluate methods to calculate metal and metal hydride x-ray photoelectron (XPS) spectra from molecular structures. This will make it possible to calculate expected XPS spectra, and thus obtain information on the energy of electrons in the compound. Thus far, I have calculated core electron energy shifts between Copper and Nickel atoms and their hydrides, and between Copper Hydride and Copper Hydride complexes with ligands. This was done using QChem software with WebMO to run Density Functional and Ab-Initio calculations on the optimized molecular geometries. Both the ground state energy and core electron ionized energy of each molecule were calculated. The difference between these is the core electron ionization energy, and the difference between the core electron ionization energies of the metal atom and the metal hydride or ligand complex gives the core electron energy shift. At this stage, I expect to be able to report correlations between core electron ionization energy shifts in Copper and/or Nickel complexes and other factors, such as the ligand used in the complex or other attributes of the molecule. This will be used in the future to establish accurate and efficient methods for calculating transition metal XPS spectra.

Benjamin David Krentz (253)

Faculty Mentor/Collaborator: **Warren H. Gallagher**

External Collaborators: **J. Colin Murrell, University of Warwick**, and **Alan A. DiSpirito, Iowa State University**

The Environmental and Genetic Rhythm Governing the Production of Methanobactin

Methanobactins are peptide-derived, copper-binding molecules produced by methanotrophic bacteria that use methane as their primary source of carbon and energy. These molecules are synthesized from ribosomally-produced peptides to scavenge copper ions from the environment and the methanotrophs use this copper to meet the needs for the pMMO enzyme that catalyzes the conversion of methane to methanol. Methanobactins have been identified for a number of methanotrophs, but only two, the ones produced by *Methylosinus trichosporium* OB3B (mb-OB3b) and Methylocystis Strain SB2 (mb-SB2), have so far been chemically characterized. Recently, the gene for a methanobactin precursor has been discovered and mapped for mb-OB3b. In light of this discovery, a genetic knock-out mutant was engineered from native *M. trichosporium* that does not produce methanobactin. Analysis of the excreted material that is produced in lieu of methanobactin demonstrates the presence of a siderophore or iron-binding molecule. Specifically, mass spectral and liquid chromatography is used to demonstrate that a chemical component of the knock-out mixture is able to bind iron (II) and undergoes a chromophoric shift similarly to a siderophore. This discovery yields a deeper understanding of the genetic operators that modulate the production of methanobactin by *M. trichosporium*.

Brent Phillip Lehman, Stephanie Narges Tadayon, James Michael Johnson and Arrianna Mae Zirbes (227)

Faculty Mentor/Collaborator: **Sanchita Hati**

Application of Statistical-Thermal Coupling Analysis to Identify Residue-Residue Interaction Networks that Facilitate Coupled-Domain Dynamics in Aminoacyl-tRNA Synthetases

Aminoacyl-tRNA synthetases (aaRSs) are multi-domain proteins that catalyze covalent attachment of amino acids to the 3'-end of the cognate tRNA molecules. Long-range domain-domain communications are known to play an important role in the function of aaRSs. Earlier studies have demonstrated that the coupling of domain motions is important in mediating long-range inter-domain communication in modular proteins. However, the molecular mechanism of coupled-domain motions and long-range communication in aaRSs has remained poorly understood. In the present study, the molecular mechanism underlying the coupled-domain motions in aaRSs has been probed. Specifically, a bioinformatics-based analysis has been performed to trace "pre-existing" interaction networks that facilitate coupled-domain dynamics. Herein, we will report the Statistical Thermal Coupling Analysis (STCA) method, which integrates the information of dynamic coupling of residues with their evolutionary features (conserved and coevolving). The STCA method is applied to three aaRS systems: methionyl-, leucyl- and prolyl-tRNA synthetases. The present study demonstrated that the dynamic coupling among distant domains of these aaRSs is maintained through networks of evolutionarily constrained residues that are engaged in correlated motion. Moreover, multiple residue-residue interaction networks between distant functional domains are revealed in this study. Existence of these interaction networks is consistent with mutational data and is supported by computational studies.

Morgan Levi Leider (202)

Faculty Mentor/Collaborators: **Frederick W. King** and **Christine M. Morales**

Interfacing Atomic and Molecular Computer Codes with a Graphical Processing Unit

High precision quantum chemistry calculations for many electron elements are so complex that they take huge amounts of CPU time to complete. The focus of the present research is to significantly speed up the integral evaluation phase of quantum mechanical calculations on a four-electron atomic system with the goal of determining a number of properties, such as the energy and the electron density. By utilizing newer technology such as multi-CPU and GPU (graphical processing unit) computing, it is possible to reduce the total computing time of a major atomic calculation to a small fraction of what would be obtained running on a single core computer, thus greatly reducing the overall time to evaluate various atomic properties. Presently, this project has yielded multi-CPU code that is over eight times faster than a version of the code that runs on a single CPU. Currently we are working on integrating a GPU into the code.

Michael O'Neal McAnally (156)Faculty Mentor/Collaborators: **James E. Boulter** and **James A. Phillips***Stable O₄: Where Are the Electrons?*

Most oxygen exists as O₂, two oxygen atoms fused together by electrons in a covalent bond; this is the oxygen that we breathe. A less common formulation is ozone, O₃, which serves vital roles in the atmosphere. We have studied how electrons are arranged in a set of proposed, stable O₄ complexes from the view of computational chemistry. A variety of established O₄ compounds have been predicted by means of expensive computational resources, but in-depth study of the electronic configurations has been limited. Focusing on the hypothetically stable covalently bonded O₄ molecule, and the experimentally observed van der Waals complexes, intensive examination of electronic structure will be presented. Molecular geometries for each stable compound will be taken from recent literature, where molecular geometries were optimized at high levels of *ab initio* multireference methods. Using Gaussian09 and reported molecular geometries, we prepare the molecular electron density in a Density Functional Theory (DFT) approach; followed by the electronic configurations being examined by Natural Bonding Orbital (NBO), Atoms-In-Molecules (AIM), and Electron-Localization Functional (ELF) theories. Differences in the performance of DFT functionals will also be compared while highlighting the differences observed by the different quantum mechanical theories of electron configuration in question.

Ryan Kenneth McKenney and Kayla Anne La Plante (199)Faculty Mentor/Collaborator: **David E. Lewis***Kinetics of Competing Reactions of N-aryl-4-chloro-1,8-naphthalimides with Primary Amines*

The unexpectedly facile displacement of the *N*-aryl substituent from the 4-chloro-1,8-naphthalimides by butylamine competes with displacement of the halogen by the same nucleophile. We have determined the rate constants for these reactions under pseudo-first order conditions, and we have found that the Hammett plot of the rate constants for *N*-(substituted)phenyl-4-chloro-1,8-naphthalimides with butylamine has a large positive value of ρ , consistent with heterocyclic ring opening being the rate-determining step. When the substituent on the phenyl ring is electron-donating, the displacement of the halide becomes competitive with attack of the nucleophile on the heterocyclic ring. The mechanistic implications of this study will be presented.

Rick Miesen (230)Faculty Mentor/Collaborator: **Kurt N. Wiegel***Supramolecular Main-Chain Liquid Crystalline Polymers and Networks with Competitive Hydrogen Bonding: A Study of Flexible bis-acids and a Mixture of Rigid and Flexible Polypyridyls*

A series of novel liquid crystalline supramolecular networks formed through hydrogen bonds have been synthesized. These networks, based off of a flexible bi-benzoic acid and two types of pyridyl species- a small rigid bipyridyl capable of forming liquid crystalline phases and polyfunctional non-mesogenic pyridyl species that can compete for available hydrogen bond donor molecules. It was found that the networks display monotropic nematic character at high concentrations of disrupting netpoints- up to 50% for tetrapyridyls, 40% for tripyridyls and 35% for bipyridyls. Weak smectic phases were observed in all systems in loadings up to 10% of each disrupting unit. It is believed that the reversibility of the hydrogen bond allows for the formation of the ordered mesophases in the presence of the non-liquid crystalline groups.

Asia Marie Stephanie Riel (225)Faculty Mentor/Collaborator: **Bart J. Dahl***A "Smart" Biphenyl Lactone Containing a Nitro Acceptor and Methoxy Donor*

Biphenyl has been experimentally determined to have a solution-phase equilibrium dihedral angle of 30-40°. Although biphenyl achieves the greatest extended conjugation when planar, the steric hindrance of the ortho hydrogens prevents this geometry from being at an energetic minimum. It is known that the dihedral angle of biphenyl-containing compounds greatly affects physical properties such as electronic absorption, emission, and conductance. Most of biphenyl-containing compounds have a static equilibrium dihedral angle and thus fixed physical properties. However, we have synthesized a molecule where a reversible lactone "tether" between the two rings should force a planar geometry. This "smart" biphenyl lactone contains a methoxy electron donor and a nitro electron acceptor at the 4 and 4' positions to affect charge transfer through the ring system. By varying the pH, we are able to reversibly open and close the "tether" and thus should switch the molecule in and out of planarity. The results of this pH-driven dihedral angle switching can be analyzed by UV-Vis spectroscopy. The design, synthesis and characterization of this "smart" biphenyl will be presented.

Nicholas John Sortedahl (226)

Faculty Mentor/Collaborator: **Bart J. Dahl**

Synthesis and Study of Monodispersed Oligophenyl Lactones

The goal of this project is to create and study different oligophenyl lactones that vary in both shape and size. We are interested in these compounds because they should prove to be useful in applications such as solar cells, light-emitting diodes, and semiconductors in thin film transistors. Our approach is to solve two problems associated with polyphenylenes. The first is an unfavorable dihedral angle between each phenyl group. The lowest energy conformation of biphenyl is 30-40 degrees while the best electron transport properties should occur when the dihedral angle is 0 degrees. The twist between phenyl groups keeps electrons from moving easily from one end of the molecule to the other. The second and more difficult problem is poor solubility due to strong pi stacking. The properties of these molecules can be approximated by the “particle in a box” model used in quantum mechanics. This model suggests that longer oligophenyl lactones will be useful for absorption, and emission of longer wavelength light. Conversely the shorter molecules will absorb, and emit shorter wavelengths.

Alexander Michael Strom (248)

Faculty Mentor/Collaborators: **Sudeep Bhattacharyay** and **Sanchita Hati**

Comparison of Coarse-Grained and Atomistic-Level Simulations for Aminoacyl tRNA-Synthetases

Aminoacyl tRNA-synthetases (AARSs) are a group of multi-domain enzymes responsible for catalyzing the covalent attachment of an amino acid to its corresponding tRNA forming an aminoacyl-tRNA. A characteristic of AARSs is the large-scale conformational changes they undergo during enzymatic activity. These slow, large-amplitude motions are associated with conformational changes of the protein as it oscillates between unbound (inactive) state and the bound (active) state. In this study, both atomistic-level and coarse-grained dynamic simulations were conducted on *E. coli* methionyl tRNA synthetase, *E. faecium* prolyl tRNA synthetase, and *T. thermophilus* leucyl tRNA synthetase. In an atomistic-level multi-domain (MD) simulation, each atom's motion in a molecule is calculated using Newton's second law (the force, $F=m(\text{mass})\times a(\text{acceleration})$) to create a highly detailed representation of the atomic movements and fluctuations. However, this widely used and well respected method often requires days of high-speed calculations in order to simulate only a few nanoseconds of protein motion. On the other hand, coarse-grained simulations treat a molecule as an elastic mass-spring network of grouped atoms. This type of simulation requires dramatically less computational power, saving time and financial resources. In this study, we will present a comparison of the protein dynamics simulated by these two methods. This study will help in determining a more economical, yet accurate approach for studying dynamics of large, multi-domain proteins like aminoacyl tRNA-synthetases.

Stephanie Narges Tadayon, Arrianna Mae Zirbes, James Michael Johnson and Brent Phillip Lehman (228)

Faculty Mentor/Collaborators: **Sanchita Hati** and **Sudeep Bhattacharyay**

Computational and Experimental Studies to Unravel the Role of Editing Domain of Bacterial Prolyl-tRNA Synthetases in Amino Acid Activation

Prolyl-tRNA synthetases (ProRSs) are multi-domain proteins that catalyze covalent attachment of proline to the 3'-end of the tRNA^{Pro}. ProRSs from all three kingdoms of life are known to misactivate alanine and form mischarged tRNA^{Pro}. To maintain high fidelity in protein synthesis, some ProRSs have acquired editing mechanisms. The insertion domain (INS, ~180 amino acids) of *Escherichia coli* (Ec) ProRS is the post-transfer editing active site that hydrolyzes specifically mischarged alanyl-tRNA^{Pro}. Experimental studies have demonstrated that the INS domain of Ec ProRS also have a significant impact on amino acid binding and activation. To explore what exact role the editing domain plays in amino acid activation, the dynamic coupling between editing domain and various structural elements of catalytic domain of Ec ProRS was studied by performing molecular dynamics simulations. Statistical-thermal coupling analysis was performed to identify residue-residue interaction networks that facilitate coupled-domain dynamics in Ec ProRS. Site-directed mutagenesis and kinetic studies are being carried out to explore the impact of mutation (of residues in the interaction networks) on enzyme activity. We will report the computational and experimental results that demonstrate the role of editing domain is to maintain the intrinsic protein dynamics and stabilize the catalytically important proline-binding loop.

Hilary Elaine Wiltgen (203)

Faculty Mentor/Collaborator: **Bart J. Dahl**

Synthesis and Characterization of “Smart” Biaryl Sultines

Biphenyl-containing compounds could be imagined to exist in two states, either planar or non-planar. In the non-planar state, the dihedral angle would be large, thus attenuating the electronic communication between the two rings. In the planar state, electronic communication between the rings would be facile. In reality, most biphenyl-containing compounds have been known to exist at a dihedral angle of static equilibrium and thus these two-states would be impossible to achieve. However, physical properties such as electron absorption, emission, and conductance are highly dependent on this dihedral angle. By synthesizing a reversible tethered sultine bridge, a switching mechanism can be implemented to achieve a two-state switch and thus control the fundamental properties of these compounds. Thus, the goal of this project is twofold: a) synthesis and characterization of a donor-acceptor biaryl compound containing a reversible tethered sultine bridge and b) exploration of dihedral modulation via pH and UV-Vis spectroscopy.

Yer Yang (250)

Faculty Mentor/Collaborator: **Sudeep Bhattacharyay**

Energetics of Hydride Transfer Reactions in Quinone Reductase 2

Quinone Reductases belong to the class of flavin-dependent oxidoreductases. With their redox active cofactor flavin adenine dinucleotide (FAD), quinone reductases are known to utilize a ping pong kinetic mechanism during catalysis in which a hydride is swapped back and forth between flavin and its two substrates. In the first step, one substrate binds the active site and donates the hydride to the flavin. The oxidized substrate is then released followed by binding of the second one (in the same active site) which accepts the hydride producing the oxidized flavin and the redox cycle continues. We are using quantum mechanical/molecular mechanical (QM/MM) simulations to explore the ping-pong kinetics in Quinone Reductase 2 (NQO2). The flavin ring atoms are treated with density functional theory, while embedded in molecular mechanically-treated enzyme active site atoms. In the cellular environment, NQO2 catalyze the conversion of prodrug into drug and understanding the energetics involved in this ping-pong kinetics will aid in mechanism-based drug design. The QM/MM setup, methods, and some results will be presented.

Arrianna Mae Zirbes and Brent Phillip Lehman (229)

Faculty Mentor/Collaborator: **Sanchita Hati**

Exploring the Role of Coupled-Domain Dynamics on the Enzymatic Function of Leucyl-tRNA Synthetase

The aminoacyl tRNA-synthetase (aaRS) is a family of enzymes that catalyzes a key reaction in protein biosynthesis – the covalent attachment of amino acids to tRNA molecules. These are large proteins with separate functional sites called domains. These distantly located domains coordinate their function in order to maintain fidelity in protein synthesis. However, the molecular mechanism of long-range site-to-site communication is poorly understood in this family of enzymes. Presently, we are exploring the role of coupled-domain dynamics in such long-range site-to-site communications in an aaRS, leucyl-tRNA synthetase (LeuRS), which catalyzes the covalent attachment of the amino acid leucine (Leu) to its cognate tRNA. We have employed bioinformatics, as well as computational and biochemical methods to trace the domain-domain communication pathways in this enzyme, and have been successful in identifying networking residues that facilitate domain-domain communication in *E. coli* LeuRS (EcLeuRS). Currently, a variety of molecular biology and biochemical techniques, primarily site-directed mutagenesis, are being used to experimentally probe the computationally determined interacting networks that facilitate inter-domain communication in EcLeuRS.

MATERIALS SCIENCE CENTER

Austin Richard Bol and Dylan Gary Karis (266)

Faculty Mentor/Collaborator: **Elizabeth M. Glogowski**

Synthesis and Triggered Reversible Self-assembly of the “Smart” Polymer Poly((2-dimethylamino)ethyl methacrylate)

“Smart” polymers, which respond to different stimuli such as pH, temperature, and ionic strength, can be synthesized and self-assembled for a wide range of potential applications, such as drug delivery or cosmetics. A variety of stimuli-responsive polymers with targeted molecular weight and chemical functionality have been synthesized previously using Atom Transfer Radical Polymerization (ATRP). We have synthesized the “smart” homopolymer poly((2-dimethylamino)

ethyl methacrylate) (PDMAEMA) by ATRP and characterized the homopolymer by NMR, GPC, and ESI-MS. The cloud point for PDMAEMA was measured as a function of pH and temperature using UV-Visible spectroscopy to determine the change in water-solubility for this thermoresponsive “smart” polymer. Low molecular weight PDMAEMA chains were coupled with 2-hydroxyethyl methacrylate to synthesize a macromonomer to ultimately achieve comb polymers. Investigation of the impact of the comb polymer architecture on the thermoresponsive behavior of the PDMAEMA “smart” polymer are ongoing. ATRP provides a powerful synthetic tool to finely tune both “smart” chemical functionality and comb polymer architecture to achieve stimuli-responsive polymers for use in a broad range of applications.

Daniel Adam Decato (251)

Faculty Mentor/Collaborator: **Jennifer A. Dahl**

Rapid Microwave-Assisted Shape Controlled Synthesis of Silver Nanoparticles

The majority of procedures for shape-controlled silver nanoparticle synthesis report the use of a common set of reagents: a source of silver ions, a reducing agent, a shape directing agent, and a capping/protective agent. Associated reaction times are long, typically ranging from 24-72 hours. We have developed a rapid microwave-assisted synthesis that includes only water, silver ions, and polyvinylpyrrolidone (PVP) and produces predictable sizes and shapes of silver nanoparticles in 20 minutes. This result is notable on two fronts: the large reduction in reaction time and the elimination of purported shape-directing agents, marking a clear departure from commonly accepted theories of shape-controlled Nanosynthesis. Additionally, we are the first group to characterize silver nanoparticles with both transmission electron microscopy (TEM) and atomic force microscopy (AFM), offering clear evidence for the existence of triangular nanoplates. The synthesis has great potential to be adapted for undergraduate Materials Science coursework due to its simplicity, rapid product formation, and facile characterization by AFM. We anticipate that further investigation into this synthesis will reveal the true role that PVP plays in the formation of silver nanoparticles and will lead to better control of size, shape, and dispersity.

Tayo Aliake Sanders II (252)

Faculty Mentor/Collaborator: **Jennifer A. Dahl**

Two-Dimensional Arrays of Alkanethiol-Capped Gold Nanoparticles: Analysis of Monolayer Formation Using a Langmuir Trough

The structural dynamics of thin films of surfactant molecules can be characterized by their behavior in a Langmuir trough, where the molecules reside at the air-water interface. Parameters such as molecular order, film density, and surface pressure are easily addressed, and multilayer superstructures can be fabricated using this classic surface science strategy. Less common is the use of a Langmuir trough for the fabrication of organized two-dimensional arrays of alkanethiol-capped gold nanoparticles. Here, hydrophobic nanoparticles are added to the air-water interface as a solution in hexanes; as the solvent evaporates, the floating nanoparticles can be compressed into a monolayer within the Langmuir trough. Preliminary studies will explore the relationship between film morphology and the length of the hydrocarbon chain, as well as changes in surface pressure as a function of aqueous subphase temperature. The assembled films will be transferred to a solid substrate for direct structural analysis via electron microscopy. Future studies will address biphasic, regioselective ligand exchange reactions and the development of these systems as a new phase transfer catalyst.

COMPUTER SCIENCE AND MATHEMATICS

COMPUTER SCIENCE

Winston Jon Mosher and Corey Alexander Schulz (55)

Faculty Mentor/Collaborators: **Christopher R. Johnson** and **Daniel E. Stevenson**

Using Computer Tools to Automate Age and Growth Measurements from Fish Otoliths

Our project focuses on improving the speed and accuracy of fish otolith (ear stones) examinations. A fish otolith's birth date can be an important correlate to evolutionary fitness because birth timing can profoundly affect growth and survival. Assessments of birth date and early growth are based on counts and increment measurements from fish otolith rings. Because otoliths are small and rings are numerous, age assessments and increment measurements are very susceptible to human error. To solve this we analyzed a user drawn line on an otolith to find local troughs (areas with the least brightness). These troughs represent one ring on the otolith. The difficult part came in removing the detection of false rings from imperfect images. To accomplish this we used mathematical smoothing methods. One method was to ignore troughs that

appear too close to one another. These troughs represent imperfections in the image, rather than another ring. We expect to be able to report with less than 10% error the number of rings, their increment measurements, and other needed information. By automating this process, we can obtain more data on more samples in less time, thus gaining more knowledge.

Katrina Mary Russell and Jonathan Kyle Fretheim (54)

Faculty Mentor/Collaborator: **Christopher R. Johnson**

Reader-Animated Storybooks

Our research goal was to develop a working prototype for a children's literature genre we are calling reader-animated storybooks. These are multi-page digital books where animations are triggered by the user reading on-screen text aloud. This is both a novel application of speech-recognition systems and an innovative approach to encouraging literacy. We have developed a prototype for such a book targeting Android devices as well as a process of collaboration between artist and programmer. We devised a framework in which the artist can create the animation using existing tools (e.g., Adobe Flash, video editing software, etc.) and provide simple configuration details to create a working storybook. We anticipate making our work available as a free download on the Android Market.

Mitchell Douglas Wood and Conor James Sherman (39)

Faculty Mentor/Collaborator: **Daniel E. Stevenson**

Analyzing Image Files for Modification

In this project we designed a program that detects intentional modifications in photographs. The availability of tools such as PhotoShop and Gimp has allowed people to easily create high quality, subtle changes to images. Automatic detection of "Photo shopped" images can be useful to anyone who is skeptical of the validity of media sources. In the first stage, image file formats were broken down to better understand their structure. Most photographs are stored in the jpeg format which is a complex glossy format. We examined both the image metadata as well as jpeg quantization tables to determine if modifications could be detected using this information. A program that makes modification determinations was constructed using this information. Accuracy of the program is being evaluated. Future work will incorporate additional, more complex techniques such as pixel error analysis to further refine detection.

MATHEMATICS

Russell Michael Chamberlain (79)

Faculty Mentor/Collaborator: **Manda R. Riehl**

Generating Functions and Wilf Equivalence on Θ_k -embeddings

Langley, Liese, and Rempel, in [Rationality, Irrationality, and Wilf Equivalence in Generalized Factor Order](#), found generating functions for word embeddings, and several results on Wilf-equivalence. Earlier, Noonan and Zeilberger, in [The Goulden-Jackson Cluster Method: Extensions, Applications and Implementations](#), extended the Goulden-Jackson Cluster Method to find generating functions of word factors. We define a generalization of both ideas called Θ_k -embeddings, which includes word factors and word embeddings. A word w is said to Θ_k -embed u if there is some subword v of w such that for all $1 \leq i \leq \text{length}(u)$, $u_i \leq v_i \leq u_i + k$. We present weight-generating functions for the number of w embedding u for some classes of words u . We also present some results and conjectures on Wilf-equivalence for Θ_k -embeddings. This includes a redistribution-rearrangement theorem which gives all Wilf classes for non-overlapping words, as well as a conjecture on overlapping words. Word matchings have been applied to the problem of creating efficient algorithms for identifying obscenities (where letters of the alphabet are represented with numbers). For example, one might want to ensure that the words SEX, SEXPOT, etc., are excluded, but ESSEX is not. This is called the subword matching problem, which our research extends.

Ryan Stance Davis and Adam Matthew Gewiss (38)

Faculty Mentor/Collaborator: **Ursula A. Whitcher**

Constructing Tops in Higher Dimensions

The polar duality transformation takes any polytope with vertices in an integer lattice to its polar dual. A lattice polytope can be called reflexive if its polar dual is also a lattice polytope. Reflexive polytopes have been classified in three and four dimensions. An object related to a reflexive polytope is a top, which is a lattice polytope where one facet contains the origin. Bouchard and Skarke have classified the three-dimensional tops corresponding to each class of reflexive two dimensional polytope shadow, and described the connections between tops and elliptic fibrations and string theory. An important result of their analysis was the finding that three dimensional tops have an infinite number of families. By extending the Type-A

construction of Bouchard and Skarke, we have developed an algorithm capable of computing tops for any reflexive polytope. Furthermore, this algorithm is able to identify the infinite families of tops generated by the dual of the n -dimensional simplex. We implement our algorithm using the Sage computer program to define these families of tops. Our algorithm can also serve to provide a means of visualizing tops in four dimensions.

Kelsey Marie Franko, Wai Shan Chan and Cary James Schneider (53)

Faculty Mentor/Collaborator: **Colleen M. Duffy**

Algebra Associated to the Hasse Graph of the n -dimensional Hypercube

The primary goal of our project is to determine the structure of the algebra associated to the n -dimensional hypercube and its symmetries. With the researchers having complementary backgrounds in mathematics and physics, the research is of interest because the construction of the algebra can be generalized to other graphs of different meaning. In order to understand the algebra, we apply a symmetry to the hypercube, build the Hasse graph from the result, and use combinatorics to count the relevant paths in the graph. We were able to find functions that encode information about the action of the symmetry on the hypercube. These functions allow us to completely determine the structure of the algebra. We have added to the understanding of the algebra, as well as the behavior of n -dimensional hypercubes under a permutation.

Joshua Joseph Frinak and Austen Isaac Ott (40)

Faculty Mentor/Collaborator: **Michael R. Penkava**

Extensions of Infinity Algebras

Associative or Lie algebras have a product which is a function that takes two inputs and gives one output. Infinity algebras are functions which take any number of inputs and generate an output. The moduli space of algebras is the set of equivalence classes of algebra structures up to isomorphism. For associative algebras, we can construct the moduli space of higher dimensional algebras from the moduli space of lower dimensional algebras by using the Fundamental Theorem of Finite Dimensional Algebras, which gives a decomposition of the algebra as an extension of a semisimple or nilpotent algebra by a nilpotent algebra. We have been studying extensions of infinity algebras, and constructing the corresponding moduli spaces. It turns out that most infinity algebras of a fixed degree are not extensions, unlike the associative algebra case. We have constructed several examples of moduli spaces of low dimensional infinity algebras, and have determined which algebras are extensions. In addition we give a description of the versal deformations which helps to provide a complete understanding of how the moduli space is glued together with a stratification by projective orbifolds. Connections between the strata are given by jump deformations and deformations that factor through jump deformations.

Peter James Kiefer (78)

Faculty Mentor/Collaborator: **Manda R. Riehl**

Combinatorics of Chord Progressions

We analyzed chord progressions from collections of music from classical composers in the 17th and 18th centuries. Our goal is to show chord progressions that are common to a specific collection of music or, in a more general sense, a composer. We achieved this by analyzing the chord sequences in Bach, Mozart, and Beethoven pieces using probability matrices and Markov chains. We used previous research in this area for our data on chords in Bach and Mozart's work. We are now collecting our own data on chords in Beethoven's piano quartets. From this analysis we obtained the probability of any chord progression in that composer's work, as well as finding the most probable chord progression. The applications of this research could show, through mathematical analysis, defining elements of composers and perhaps transitions of style, from Baroque to Romantic, for example, or from one century to the next.

Nolan Kriener (31)

Faculty Mentor/Collaborator: **Alexander J. Smith**

Exploring the Roots of the Derivative of the Riemann Zeta Function

The Riemann zeta function is associated with many unsolved problems in the world of mathematics and has been analyzed for many years. We focus on the zeros of the derivative of this function, a topic that has not been as thoroughly explored as the original function's zeros. Using topics and equations learned in a class dealing with complex and imaginary numbers, the number and location of the zeros of a function can be determined. In this project we used the Maple and MATLAB mathematics computer programs to perform the calculations required for locating these zeros. These programs were also used to generate a graph and a histogram of these locations. The poster for this project explains these methods in depth,

along with the graph and histogram of zeros that were created. This project has many applications to theoretical studies in mathematics, and will help contribute to further research done in the field of complex numbers and matrices.

Bria Elaine Morgan and Daniel Christopher Schilcher (29)

Faculty Mentor/Collaborator: **Dandrielle C. Lewis**

Constructing the Subgroup Lattice of $D_8 \times D_8$

In 1889, Edouard Goursat formulated a theorem in group theory that provides the subgroup structure of a direct product of finite groups A and B. It does this by relating the isomorphism of a factor group of A and a factor group of B with a corresponding subgroup of the direct product. This provides the backbone for a powerful method, developed by Dr. Dandrielle Lewis, of characterizing subgroup containment in a direct product. In this project, we have been using this method to construct the subgroup lattice of the direct product of the dihedral group of order 8, D_8 , with itself. We have ascertained that the group $D_8 \times D_8$ has 389 subgroups, consisting of 1 of order 1, 35 of order 2, 127 of order 4, 143 of order 8, 67 of order 16, 15 of order 32, and $D_8 \times D_8$ itself, of order 64. We have completely determined up to isomorphism, all the subgroups of order 2 and 4 and are currently determining the subgroups of order 8.

Caitlin Rose Olig, Rachel Louise Brion and Molly E. Dieterich (117)

Faculty Mentor/Collaborator: **Jessica J. Kraker**

Survey-Based Assessment of Cultural and Religious Associations with Voting Decisions

We are conducting a survey on campuses within the UW-System in order to draw conclusions about the relationship between UW student voters' cultural and religious influences and their voting ideologies. This broad survey distribution will provide information for a complete statistical analysis and exploration of meaningful data. We hope that this survey will also provide results that could assist in the development of diversity programs and give insight into improvements that could be implemented in already existing religion courses or diversity programs. The survey has been revised and honed from a previously distributed survey, with implementation of respondent feedback from the original distribution. We plan to use chi-square tests for association along with other statistical methodologies to conduct the analysis. We anticipate that cultural exposure will vary widely between different universities. We hypothesize that there will be an association between students' cultural exposure backgrounds and the likelihood that they would vote for potential presidential candidates of varying religions and ethnicities.

Robert Jerome Paquin (77)

Faculty Mentor/Collaborator: **Chris R. Ahrendt**

Intervals of Existence for Solutions of Certain Dynamic Equations on Time Scales

This paper analyzes dynamic equations on time scales and the intervals of existence of solutions on a special class of time scales consisting of a finite number of intervals. We solve a given dynamic equation and examine its interval of existence. If the solution happens to contain an asymptote at the right endpoint of the interval of existence, we proceed by removing an interval around such an asymptote and thus create a new time scale. In the time scale calculus, we define a generalized derivative called the Delta-derivative and use this to explicitly find the solution on these time scales. The main result of this work shows that building a sequence of time scales, as described above, for our particular dynamic equation does not lead to a solution that has an unbounded-above interval of existence.

Blake Robert Smith and Chao Pang (30)

Faculty Mentor/Collaborator: **Carolyn A. Otto**

Determining a Group of Rational Tangles

The objective of our project was to determine a group from the set of rational tangles. Tangles can be thought of as the "building blocks" of mathematical knots. A knot is a non-intersecting curve in 3-space without endpoints that are created out of these tangles. These objects are commonly seen in modeling DNA recombination events. By creating a computer program to compute the rational number of tangles and their respected initial and terminal position of their components, we were able to analyze these objects on a larger scale. With the use of our program, we have noticed patterns emerge among the type of tangle, its respected rational number, and the sequence of odd or even twist within the tangle's vector. From these qualities, we have discovered a subset of tangles that are closed under tangle addition. Also, we have determined specific subsets of this collection to be known groups. This project is still ongoing and we hope to categorize the tangles not in a known group.

Trevor Donovan Thompson (64)

Faculty Mentor/Collaborator: **Jonathan J. Armel**

Classification of Rational Lemniscates in the Complex Plane

We seek to generalize the work of Ebenfelt et al.[1] which classifies shapes in the complex plane. Their work is based on shapes generated by polynomial functions, which we seek to extend to those generated by rational functions. These classifications allow one to define a “fingerprint” for each shape, which is unique up to translations and scaling. The end result of these classifications has various applications in computer imaging. Our methodology follows a similar course to that presented by [1], but rational functions create the possibility of division by zero, which is not an issue with polynomial functions. We began by using the Riemann-Hurwitz formula to determine criteria which rational functions must meet in order for the fingerprint to be defined, and are currently using techniques from Complex Analysis to determine the new classifications. [1] P. Ebenfelt, D. Khavinson, and H. S. Shapiro, [Two-dimensional shapes and lemniscates](http://arxiv.org/abs/1003.4567v1), <http://arxiv.org/abs/1003.4567v1>, 2010.

Sean Michael Vanden Avond, Noah N. Williams and Chun yang Tang (63)

Faculty Mentor/Collaborator: **Simei Tong**

Inequalities and Isomorphisms in L_p Spaces, $p > 2$, with the Alspach Norm

Understanding spaces has important applications in mathematics, physics, and engineering. Mathematicians use inequalities to establish isomorphisms between subspaces of and spaces of sequences, which are better known. In 1999, Alspach proposed a norm defined by partitions and weights to further classify the complemented subspaces of L_p . Tong, Phillipson, and Defrain have explored this norm for pairings of one and two partitions with weight functions. In our research, we expand upon their work by considering Alspach’s norm for two or more partitions and weights.

Noah N. Williams (62)

Faculty Mentor/Collaborator: **Manda R. Riehl**

The Deletion-Insertion Model Applied to the Genome Rearrangement Problem

Many mathematical models have been developed to help solve the genome rearrangement problem. These models aim to find the optimal sequence of mutations for the transformation of one genome into another. However, few of these representations consider small segments of DNA where deletions and insertions are the primary mutations. We created the Deletion-Insertion model in order to provide bioinformaticians with a tool for studying diseases, like Neurofibromatosis, which can develop as the result of a single deletion or insertion. In this research, we use combinatorics to develop a distance formula, and we analyze and apply it to simulate genome rearrangement by deletions and insertions. Our results contribute to the understanding of diseases and of the evolutionary relationships that exist between organisms and their biological ancestors.

EARTH SCIENCE

GEOGRAPHY / ANTHROPOLOGY

Nicholas Thomas Bohl, Kelsey Joy Dery, Lindsay Gabrielle Jenson, Jessica Teresa Stodola and Jenna Marie Snyder (6)

Faculty Mentor/Collaborator: **Sean Hartnett**

Accuracy of Global Positioning System Receivers

Common questions of GPS equipment are: How accurate is the piece of equipment and how does it rate when compared to other units? However, little research has been done to answer these questions. As a result, members of the Geography department developed a route around the UWEC campus that tests GPS in various geographic environments ranging from out in the open, to a space surrounded by buildings to being surrounded by heavily wooded trails to cartographically measure the accuracy of these units. Taking notice of recent research conducted at UWEC, Garmin International sent the Geography department their newest GPS unit, the Garmin Montana, to test the accuracy of the Montana and compare it with other GPS units with various technical sophistications and price ranges. The key units being tested in this study are the Trimble ProXR, Trimble ProXT, Garmin Montana and Garmin e Trex. Point data accuracy, line data accuracy, and elevation transects data

were tested in the array of settings and environments previously noted. Based on the results of this experiment, the GPS units are ranked based on their accuracy.

Samuel Adams Krueger and Carl Peter Reim (9)

Faculty Mentor/Collaborators: **Christina M. Hupy** and **Jeff R. DeGrave**

A Spatial Look at Pico-HydroTurbine Locations in Rio Negro

For thousands of years, isolated rural communities have been harnessing river power to assist in making their livelihoods easier and more efficient. Stream/river hydro turbine technologies, specifically pico-hydro systems, are common in the remote rural landscape of Honduras. Pico-hydro turbines differ from many other hydropower systems as they are more compact, incredibly efficient, and offer a renewable energy source. Turbines have a tremendous impact on the economic development in remote areas by providing energy for mechanization of agricultural, domestic, and industrial tasks that previously relied on manual labor. Topographical factors affecting turbine output efficiency include elevation, slope, and flow of water or current strength. The goal of this research is to study the locations of existing pico-hydro turbines in the areas of Rio Negro Honduras in order to assess the effectiveness of current operations, as well as to facilitate in the planning of future turbine location. A suite of spatial data including elevation, slope, and distance from stream headwaters were compiled and overlaid with a database of existing pico-hydro turbine locations in a Geographic Information System. The summarized data of site criteria were used to identify other potential sites for pico-hydro turbine locations in the region.

Rebecca Jean Moore, Arie Alexander Peterson and Thomas Robert Veit (32)

Faculty Mentor/Collaborators: **Christina M. Hupy** and **Kent M. Syverson**

A GIS-based Suitability Model for Frac Sand Mining in West-central Wisconsin

Frac sand mining is an important new industry in west-central Wisconsin. Mining companies are attracted to west-central Wisconsin because the Jordan and Wonewoc geologic formations found in the region contain round, strong, quartz grains that are of a high quality for use in “fracking”. “Fracking” is a newly developed process to enhance oil and natural gas extraction by injecting sand and fluids through wells and into formations. The goal of this project was to develop a GIS-based suitability model for frac sand exploration in Trempealeau County and Buffalo County, Wisconsin. A suite of spatial criteria were used to evaluate the potential of areas for mining: distance from major roads and railroads, overburden thickness, water table depth, sand unit thickness and elevations, pre-existing mine site locations, and sandstone quality. Data has been collected from the Buffalo and Trempealeau Land Conservation offices and the Wisconsin Department of Natural Resources. This data will be supplemented by some field observations. Criteria were ranked according to suitability for mining and were then compiled into a final index map. The final map identifies locations in the county that are highly suitable for frac sand exploration.

Tyler O. Schwartz (10)

Faculty Mentor/Collaborator: **Christina M. Hupy**

Remotely Sensed Water Quality Comparisons between Lake Wissota and Pettenwell Flowage

Algae blooms are becoming an increasing water quality issue for many Wisconsin lakes--both for the recreational users of the lake and for the fish and wildlife populations within the lake ecosystem. This pilot study explored the relationship between algae blooms and phosphorus pollution in two lakes in Wisconsin, Lake Wissota and Pettenwell Flowage, using geographic information systems and remotely sensed data. Satellite imagery collected by the Landsat ETM sensor was obtained and processed for the study area. Field data were collected, using a secchi disk, on Lake Wissota, coincident with the imagery collection. The secchi disk data were used to establish a relationship between the brightness values of the image pixels and *in situ* algae content. This relationship was then used to interpolate algae content for the surface of both lakes. Elevation data were then used to delineate the immediate watershed of each lake. Within each watershed point and non-point phosphorous pollution sources were identified and quantified. Phosphorous was chosen for this analysis because it is considered a “limiting nutrient” in algae blooms. The algae content and quantity of phosphorous pollution sites were compared between the two lakes. This research serves as a starting point for water quality assessments for lakes suffering from phosphorus pollution and helps to illustrate a broader connection between this type of pollution and water quality degradation due to algae blooms.

Bryan William Vickroy and David Frank Hon (7)

Faculty Mentor/Collaborator: **Sean Hartnett**

Cost-Tiered GPS Unit Three-Dimensional Capability Comparisons and Testing

Handheld Global Positioning System (GPS) units are thought to be less accurate than professional grade GPS units, but little research has been done to determine the three-dimensional accuracy of equipment grade in terms of cost. By collecting three-dimensional geospatial data with multiple GPS units of differing grade, digital elevation models can be created to compare and analyze the degree of accuracy of each unit. The Garmin eTrex, Garmin Montana, and Trimble XR models were taken into the field to create base data to be converted into three-dimensional elevation models. These GPS units range in value from thousands of dollars (Trimble XR) to just a couple hundred dollars (Garmin eTrex). The three created elevation models will then be compared to each other, as well as USGS elevation maps, to see which models are most accurate and consistent to the known base elevations. The results would likely reflect the assumption that the price of a unit would impact data quality; the more expensive the unit would likely produce the most accurate elevation model of the three units tested, while the lower the cost of the GPS unit would likely mean lower quality data created due to lower quality components and technology.

GEOLOGY

Kristopher Michael Benusa and Olivia Rae Iverson (17)

Faculty Mentor/Collaborator: **J. Brian Mahoney**

External Collaborators: **D. Kimbrough, San Diego State University, and Laura Giambiagi, Conicet in Mendoza, Argentina**

Basin Evolution and Provenance Variations in the Miocene Atuel Basin, El Sosneado Region, Mendoza, Argentina

Stratigraphic successions in the southern Atuel basin record progressive orogenic exhumation and basin subsidence in the Miocene retroarc foreland basin related to the evolution of the Malargue fold and thrust belt, northwest of Malargue, Argentina. Miocene strata in the Atuel basin include Cretaceous Malargue Group, Agua de la Piedra Fm., and Loma Fiera Fm. Successive angular unconformities between units show deformation in response to movement on the Malargue fold and thrust belt. Clast count and detrital zircon analysis of the Loma Fiera Fm. constrains the depositional setting and provenance of these strata. The base begins a cyclic succession of four fining-upward sequences with a clast count revealing abundant rhyolite detritus derived from the Permian-Triassic Choiyoi Group of the Frontal Cordillera. The second count, 275 m from the base of the section, shows an increase in sandstone and limestone clasts distinguished by ammonite fossils, characteristic of the Jurassic Tordillo Formation. Previous research inferred the maximum age for the Loma Fiera Fm. is 9.5 Ma based on $^{40}\text{Ar}/^{39}\text{Ar}$ ages. Data from two detrital zircon samples indicate sediment derived from both the Permian-Triassic Choiyoi Group of the Cordillera Frontal and populations of Paleozoic and Mesozoic grains presumably derived from the Neuquén basin.

Giselle Conde (35)

Faculty Mentor/Collaborator: **Phillip D. Ihinger**

External Collaborator: **Ellery Frahm, University of Minnesota**

Chemical Effects of Glass Hydration in the Natural Environment

The hydration of glass is of great interest to industry, archaeology, and geology. Molecular water species react with silicate bonds to form hydroxyl species that allow for rapid exchange of elements into and out of the original glass. Perlite forms from hydration of natural obsidian shortly after eruption and represents a high-temperature analogue to glass hydration at room temperature. Detailed geochemical analyses of the transition of obsidian to perlite provide valuable insights into the degradation of industrial glass, as well as the decomposition of ancient glass artifacts. Understanding the fundamental chemical reactions that occur during this transition is essential to minimize the rate of industrial glass degradation and effectively preserve glass artifacts, in addition to gaining insights into their ages. Applying x-ray fluorescence (XRF) and electron microprobe techniques, we present major and trace element analyses on natural obsidian-perlite pairs collected from Ruby Mountain, CO. Hydrous species concentrations were determined using micro-IR spectroscopy. As observed in previous studies, the transition into perlite is accompanied by enrichment of K_2O , and depletion of Na_2O . The chemical behavior of trace elements during perlite formation has not been previously investigated; our studies document enrichment of Sr & Ba and depletion of Cr & Rb.

Kathryn Faye Grant, Keilor James Eggen and Timothy Hans Molitor (14)

Faculty Mentor/Collaborators: **Bridget B. Kelly** and **Katherine R. Grote**

Using Specific Conductivity as a Proxy for Assessing the Impacts of Urban Road Salting on Tributaries of the Chippewa River near Eau Claire, Wisconsin

Road salting is a necessary means of regulating road conditions in cold weather regions where winter precipitation is prolific. In Wisconsin, over 1 billion pounds of salt are applied to roadways during each winter season. Once applied, salt can utilize a number of different pathways to enter local streams during periods of increased runoff and can negatively impact aquatic ecosystems. In order to better assess the impacts of road salting on local stream quality, specific conductivity measurements were gathered from five tributaries of the Chippewa River over the 2012 winter season. The streams were chosen due to their proximity to urban areas; as such three of the stream sites are in juxtaposition with bridges along city highways. Monitoring was conducted during both scheduled and triggered events; surface water samples were also collected periodically and analyzed to determine chloride concentrations. Results of the project to date have shown that during the monitoring period, specific conductivity increased and decreased during snowfall and warming periods, respectively, suggesting that these measurements can serve as a proxy for determining chloride levels in local streams.

Cameron Alexis Hughes (34)

Faculty Mentor/Collaborator: **Phillip D. Ihinger**

Infrared (IR) Spectroscopy of Olivine from Kimberlitic Diatremes

Olivine, the most common mineral in the upper mantle, represents a major component in most mafic magmas. Olivine crystals derived from mantle xenoliths contain hydroxyl impurities and are thought to represent the major reservoir for water in the high-pressure mantle environment; however, olivine crystals sampled from tholeiitic basalts do not contain measurable water. Non-stoichiometric water is observed in a variety of nominally anhydrous crustal minerals, such as quartz and feldspar. Incorporation of water into these minerals is generally attributed to kinetic effects associated with non-equilibrium growth. Silica-poor magmas are typically volatile-rich and have extremely low viscosities, promoting rapid crystal growth during transport and emplacement. Here, we test the hypothesis that olivine crystals formed in silica-undersaturated, water-rich magmas incorporate measurable hydrous impurities due to their rapid growth. Olivine crystals from Haystack Butte, MT were analyzed using micro-FTIR spectroscopy. Petrographic analyses revealed numerous spherical vapor bubbles oriented along healed fractures within some crystals. Analyses of bubble-rich and bubble-free regions of crystals showed no absorption in either of the two hydroxyl-bearing regions documented in mantle-derived olivines ($3650\text{-}3450\text{ cm}^{-1}$, $3450\text{-}3200\text{ cm}^{-1}$). The bubble-rich regions showed prominent absorption at $\sim 3690\text{ cm}^{-1}$, indicating presence of serpentine on surfaces of spherical inclusions, likely formed from deuteric alteration.

Olivia Rae Iverson and Kristopher Michael Benusa (18)

Faculty Mentor/Collaborator: **J. Brian Mahoney**

External Collaborators: **D. Kimbrough, San Diego State University,** and **Laura Giambiagi, Conicet in Mendoza, Argentina**

Neogene Basin Evolution in the Las Peñas Basin, Salagasta Region, Mendoza, Argentina

A succession of clastic strata in the Salagasta region, northwest of Mendoza, Argentina, was deposited in the Miocene Las Peñas basin. These strata represent sediments from the Andean foreland basin unroofed by migration of the fold and thrust belt. The coarsening upward sequence and sedimentary structures indicate a fluvial depositional environment and evolution from a distal to proximal retroarc foreland basin. Three detrital zircon samples were examined from the Salagasta section to determine the timing of uplift in the Andes at this latitude. The samples display detrital zircon populations derived from syndepositional volcanism, Miocene Farallones Group, Permian Choiyoi Group, and early Paleozoic Villavicencio Fm. The lowest sample contains syndepositional zircon indicating a maximum depositional age of 8.75 Ma and a major population derived from the Permian Choiyoi Group, suggesting uplift of the Cordillera Frontal at this time. The middle sample contains peaks representing syndepositional volcanism (*circa* 8 Ma) as well as an introduction of early Paleozoic Villavicencio Fm. suggesting uplift of the Precordillera between 8.75-8 Ma. The upper sample is dominated by a strong Miocene peak reflecting sediments from the Farallones Fm, but lacks syndepositional volcanic sediments, suggesting derivation from the Cordillera Principal during a period of waning volcanism.

Olivia Rae Iverson (19)Faculty Mentor/Collaborator: **J. Brian Mahoney**External Collaborator: **Jim Logan, British Columbia Geological Survey***Reassessment of Triassic and Jurassic Volcanic Strata in the Dease Lake region, Northern British Columbia*

This project was originally designed to compare and contrast the Late Triassic Stuhini and the Middle Triassic Tsaybahe Groups due to their significant overlap in lithology and uncertain age assignment. The reference section was originally interpreted to be the Late Triassic Stuhini Group in thrust contact with the Late Triassic Cake Hill pluton. Subsequent work suggested that these strata were correlative with the informal Middle Triassic Tsaybahe Group. Lithostratigraphic features, detrital zircon geochronology, petrography, and volcanic geochemistry were examined to provide insight into the age, stratigraphic relationships, and tectonic evolution in this region. Lithostratigraphic analysis and abundant sedimentary structures indicate relatively rapid gravity flow sedimentation in a subaqueous depositional environment that shallows upward, producing a distinct coarsening upward succession. The sediments are intercalated with sills and tuffs and overlain by volcanic flows and breccias indicating syndepositional volcanism. Geochemical analysis suggests the volcanics are subduction-related island arc basalts. Detrital zircon analysis clearly demonstrates sediment derivation from a Jurassic source, indicating the rocks are properly assigned to the Jurassic Hazelton Group. This eliminates the need for the Hotailuh thrust fault and suggests a much broader distribution of Jurassic volcanic rocks in the area than previously interpreted.

Rebecca Jean Moore and Ian Fitzpatrick Freeman (33)Faculty Mentor/Collaborator: **Kent M. Syverson***Developing Glacial Landform Educational Materials for the Ice Age National Scenic Trail in Straight Lake State Park, Polk County, Wisconsin*

The Ice Age National Scenic Trail was recently constructed through Straight Lake State Park, the newest state park in Wisconsin (dedicated in 2005). The purpose of this project is to develop glacial geologic interpretive materials for the Wisconsin DNR, as there are no site-specific interpretive materials available for park visitors. Straight Lake State Park contains classic landforms of the Late Wisconsinan glaciation. These features include a tunnel channel, esker, hummocks, kettles, and a pitted outwash plain formed during or after the St. Croix Phase of the Late Wisconsinan about 20,000 cal. yrs B.P. Publications about the glacial geology of Polk County (Johnson, 2000), tunnel channels, and eskers were read in the office. One week was spent in the Straight Lake State Park area studying glacial sediments and landforms. The best locations to observe glacial landforms and other geologic landforms were selected to showcase in interpretive materials. Geological educational materials were produced in consultation with the Wisconsin Department of Natural Resources. Materials include a trail guide and multimedia presentations accessible online and via smart phones. The target date for completion of the interpretive materials is May 2012.

Nathan Neal Nushart and William Garnier Ostrenga (15)Faculty Mentor/Collaborator: **Geoffrey S. Pignotta***Using Digital Image Analysis and Electron Back-scatter Diffraction to Quantify Mineral Fabrics in Coast Plutonic Complex, British Columbia, Canada*

The Coast Plutonic Complex (CPC) of western British Columbia, Canada consists of a long, narrow belt of Jurassic to Eocene granitic to dioritic intrusions that represent more than 100 Ma of nearly continuous subduction-related magmatism. This study investigates deformation within early Mesozoic CPC intrusions in the Bella Coola area using field and laboratory techniques. Regional deformation is recorded in the intrusions as mineral fabrics that range in intensity from very weak magmatic to strong in mylonitic shear zones. To quantify magmatic fabrics in plutonic rocks digital image analysis was utilized. Image analysis data were obtained on three orthogonal planes cut in each sample and then data were combined to define a 3D fabric ellipsoid. Electron Back-scatter Diffraction (EBSD) was used to quantify the crystallographic preferred orientation of deformed minerals in shear zones. From these two sets of data, orientations of foliations and lineations for the whole rock can be determined and compared to field data where possible. Image analysis results suggest plutons record magmatic deformation with generally NW-SE foliations and moderate to steeply plunging lineations. EBSD data show that there is a definite crystallographic preferred orientation in the shear zones, which tend to be dominated by sinistral simple shear.

William Garnier Ostrenga and Nathan Neal Nushart (16)

Faculty Mentor/Collaborator: **Geoffrey S. Pignotta**

Quantifying Magmatic Strain in Plutons Using Anisotropy of Magnetic Susceptibility in the Coast Plutonic Complex, British Columbia, Canada

The Coast Plutonic Complex (CPC), British Columbia, Canada is a magmatic arc consisting of Jurassic through Eocene plutons. This study focuses on magmatic fabrics found in Mesozoic plutonic suites of the central CPC in the Bella Coola area, British Columbia. Magmatic fabrics (foliations and lineations) form during deformation of partially crystallizing magma and may record strain patterns that can be used to interpret the timing and nature of regional deformation during arc construction. Field mapping and anisotropy of magnetic susceptibility (AMS) are used to quantify the orientation, intensity and shape of the magmatic fabrics recorded in Jurassic through Cretaceous plutons. AMS is used to define magnetic fabrics within rocks. AMS data can be used to infer mineral fabrics even if fabrics are weak. AMS is a useful tool in the CPC because magmatic fabrics in plutons are often weak. Measured magnetic foliations correlate well with foliation measurements from the field and have a steep NW-SE orientation. Magnetic lineations, interpreted to reflect mineral lineations, are shallow to moderately SE plunging. Shapes of fabric ellipsoids are generally oblate, indicating flattening strains in the arc, but some locally occurring prolate fabric ellipsoids suggest possible constriction associated with regional shear zones.

LIFE SCIENCE

BIOLOGY

Jonathan Frank Ames (58)

Faculty Mentor/Collaborator: **Chris H. Floyd**

*Selection of Sap-Well Trees by a Keystone Species: The Red-Naped Sapsucker (*Sphyrapicus nuchalis*)*

An adequate understanding of the feeding requirements of keystone species is needed in order to conserve them and the community that depends on them. One of the most important keystone species is the Red-naped Sapsucker, a woodpecker that nests in aspen woodlands of western North America. Sapsuckers annually excavate a new nest cavity, creating a supply of tree holes that constitute essential nesting habitat for other cavity-nesting organisms. Sapsuckers also create sap wells in trees and shrubs, thereby incidentally providing food for other sap feeders. Therefore, local extinction of sapsuckers could trigger a decline in local species diversity; this is a conservation concern because sapsucker habitat has undergone widespread degradation. During the summer of 2012, we investigated the criteria used by sapsuckers in their choice of sap well trees in aspen woodlands of the Rocky Mountains near Crested Butte, Colorado. We found that aspens with sap well scars tended to be larger in diameter and more likely to be infected with fungal pathogens. Our results suggest that sapsuckers either prefer feeding from pathogen-infected aspens, or that their sap-feeding activity tends to facilitate pathogen infection. These results have important implications for management of aspen woodlands.

Kara Marie Braunreiter and Casey Marie Gabrhel (56)

Faculty Mentor/Collaborator: **Jamie S. Lyman Gingerich**

RNAinterference Identifies Genes Important for Cilia Structure and Function

Primary cilia perceive the extracellular environment and transmit that information to the interior of the cell. Most human cells have cilia, and dysfunctional cilia result in a wide-range of disorders including polycystic kidney disease and Bardet-Biedl syndrome. Genes critical for cilia are conserved between humans and *Caenorhabditis elegans*; however, functional cilia are not required for viability in *C. elegans*. Hence, *C. elegans* is a good model organism to study the genetic basis of cilia form and function. The PKD-2 gene product forms part of a calcium channel across the cilium in both humans and *C. elegans*. Mutations in PKD-2 cause polycystic kidney disease (humans) and male mating behavior defects (*C. elegans*). Because many different proteins must be transported to and properly localized within the cilium for proper ciliary function, analysis of the mechanisms of PKD-2 protein localization can give us insight into cilia structure and function. We are employing a reverse genetic strategy known as RNAinterference to systematically reduce function of each gene on chromosome I and examine the effects on PKD-2 localization in *C. elegans*. Once we have identified the genes affecting PKD-2 localization, we plan to examine the role these genes play in cilia structure and function.

Elise Marie Couillard (57)Faculty Mentor/Collaborator: **Chris H. Floyd***Tail Communication in the Least Chipmunk (Neotamias minimus)*

Studies of animal communication are of increasing interest to scientists as they attempt to understand the evolution of complex language in humans. For example, bird songs have been well studied in part because of their informational complexity, and prairie dogs have been found to differentiate between types of alarm calls. Behavioral ecologists are currently studying the evolution of vocal alarm communication in rodents such as chipmunks, which use tail movements in addition to vocal calls to communicate. I studied communication behavior in Least Chipmunks (*Neotamias minimus*) at Cal-Wood Education Center in Boulder County, Colorado. A catalogue of behaviors was made, and a coding sheet documented behavior over a two-week period. The coding sheet was used to record date, time, temperature, location, weather, behavior/description, situation and duration of behavior by means of a time sample recording. Behaviors were placed into eleven separate categories (alert, rest, foraging, etc.). My results indicated that chipmunks communicate largely by tail movements and not vocalizations. During my observations, chipmunks spent the majority of total time in alert and/or still poses. Here I discuss my results with regard to fitness costs and benefits of visual vs. vocal communication in chipmunks.

Tyler John Debruin and Matthew James McLean (83)Faculty Mentor/Collaborator: **David Lonzarich***Linking Large-scale Geomorphic Characteristics to Shallow-water Riverine Fish Assemblage Patterns*

The Lower Chippewa River is a dynamic fluvial system that is home to over 80% of Wisconsin fish species. Large-scale geomorphic patterns can greatly influence the diversity and availability of habitats for fish species. In 2008, UW-Eau Claire geographers identified three reaches of the lower Chippewa River that varied in stability and channel complexity. During summer 2009, UW-Eau Claire biologists completed a field study exploring patterns in the organization of fish communities associated with shallow-water habitats (riffles, backwaters, and bars) in the reaches. In summer 2011, we conducted a field and laboratory study examining patterns of fish community organization from the perspective of morphological traits associated with swimming and feeding. A suite of 15 “functional traits” was measured from 30 fish species (and several hundred specimens) commonly found in the study area. These traits were then used as a basis for grouping the different community data gathered in 2009. Our analyses of functional diversity revealed that traits associated with swimming (e.g., fin size, body depth) best explained variability in fish communities across the three habitat types, but that feeding traits (e.g., mouth size, eye size), were more important in explaining patterns of variability within a habitat type.

Aaron Roderic Devoe, Joseph J. Weirich and Laura Gaffney (61)Faculty Mentor/Collaborators: **Kelly L. Murray, Todd A. Wellnitz and Eric C. Merten***Stream-Riparian Linkages: Searching for Patterns in Invertebrate Community Structure.*

Riparian zones are critical habitats with high biodiversity which has a significant impact on both aquatic and terrestrial ecosystems. In riparian food webs both emergent and terrestrial invertebrates play key roles, influencing each other as well as organisms at higher trophic levels. Our objective was to examine emergent and terrestrial invertebrates in order to determine trends in their abundance and predator concentrations throughout the riparian zone. Sampling occurred at Cabin Creek (MN) in late May and August, and Beaver Creek (WI) in mid-July and August. Both sites were surveyed using 5 transects perpendicular to the stream placed 5 meters apart along each bank. Sampling occurred at 0, 2, and 4 meters along each transect using sticky and pitfall traps to capture flying and crawling invertebrates, respectively; sweep nets captured invertebrates clinging to vegetation. At both sites invertebrate abundance varied seasonally. Pitfall samples revealed trends of increasing abundance near stream banks that were not consistent across taxa. Spiders concentrated near a stream logjam in the middle of the sampling site. Yet sticky traps revealed invertebrate abundance increasing with greater distance from the logjam. Findings suggest seasonal variation and complex trophic interactions throughout the riparian zone.

Sarah Kay Hof (153)Faculty Mentor/Collaborator: **Daniel P. Herman***MRSA in the Community, Loja Province, Ecuador*

Methicillin-resistant *Staphylococcus aureus* (MRSA) is a strain of *Staphylococcus aureus* which is resistant to Methicillin, the antibiotic used most to treat Staph infections. MRSA poses health risks both in the United States and around the world, and is commonly a hospital-acquired infection that results in thousands of deaths annually. Little data is published on MRSA's prevalence in Ecuador and its health impact is poorly understood. In this study, nasal swabs were obtained from individuals in hospitals and rural communities in Loja Province, Ecuador. Those samples were inoculated onto mannitol salt

agar (MSA) and MSA containing oxacillin to determine which samples were potential MRSA. Gram stain, coagulase and catalase tests were used to identify potential MRSA and those samples that tested positive for those tests further underwent PCR identification to positively identify *S.aureus* versus MRSA. PCR results indicate that 26 (15.5%) of 168 samples from the Loja communities were positive for *S. aureus* and 1 of these (4%) was MRSA positive. Cariamanga Hospital results indicated that 8 (8%) of 100 sampled were positive for *S. aureus* and no MRSA. The results indicate that MRSA is not just a problem found in hospitals, but also in communities.

David Frank Hon and Matthew Jerome Moris (59)

Faculty Mentor/Collaborators: **Paula K. Kleintjes Neff** and **Sean Hartnett**

Terrestrial Invasive Plant Survey in Eau Claire County

During the summer of 2011, we collaborated with Beaver Creek Reserve Citizen Science Center and Eau Claire Parks and Forestry to survey for terrestrial invasive plant species (TIPS) in priority management areas of the Eau Claire County Forest (ECCF). A total of 29 sites were surveyed (~ 90 miles) with 2-4 person teams for 12 weeks. Field data were collected once a TIP was observed. Data included: species coverage, distribution, relative abundance, density, and site type within a 50-by-50 m square surrounding each central recorded GPS point. A total of 20 species were identified and mapped. Orange hawkweed (*Hieracium aurantiacum*), Reed Canary Grass (*Phalaris arundinacea*), Leafy Spurge (*Euphorbia esula*), Bush Honeysuckles (*Lonicera maackii*, *L. morrowii*), and Common St. John's Wort (*Hypericum perforatum*) were most abundant and of most concern due to their highly competitive and spreading nature in high traffic and biologically vulnerable areas. A descriptive model was created in ArcGIS using model builder to describe variables associated with each species, and a predictive model was created using a Python script to prioritize areas of the ECCF for future monitoring.

Kathryn Marie Kokkila (84)

Faculty Mentor/Collaborators: **David Lonzarich** and **Mary Ruth Elger-Lonzarich**

Habitat Filtering of Trait Diversity in Pine Lake's Aquatic Plant Communities

In this study we examined the aquatic plant communities of Pine Lake in northwest Wisconsin using an approach currently popular in terrestrial plant ecology, but largely unprecedented under water. This approach measures species diversity and corresponding species functional traits along environmental gradients in order to elucidate the role that habitat plays in shaping community composition. Functional traits are any features that play a role in an organism's ability to acquire resources, persist, and reproduce. In this study, the traits of interest included height, specific leaf area (cm²/g), and whole-plant percent dry matter content. Our environmental variables included depth, percent organic matter content of the substrate that the plant was rooted in, and wave exposure. We predicted significant differences in trait diversity between communities in different depth, organic, and exposure categories. To test this we used SCUBA equipment to observe 132 0.5 x 0.5 meter sample plots. Substrate samples were collected for subsequent analysis of organic content, as well as representatives of each species for trait measurement. After analysis using the program R, we found there to be significant (p<0.05) differences in trait diversity among categories of environmental variables, indicating that habitat does indeed have a filtering effect on community composition.

Molly Ann Kreiser, Gregory Thomas Nelson and Adam Christopher Schneider (60)

Faculty Mentor/Collaborator: **Tali D. Lee**

Are Stimulating Effects of Elevated CO₂ on Plant Physiology Counteracted by the Reduced Light and/or Water Availabilities Commonly Associated with Global Change?

Although greater availability of atmospheric carbon dioxide (CO₂) associated with global change is expected to boost productivity of many plant species, increase in plant size and density may increase competition for other resources such as light and water in plant communities. As part of a larger field experiment, we investigated physiological responses of *Lupinus perennis* (wild lupine) to factorial treatments of decreased light availability, decreased water availability, and elevated CO₂. We examined whether leaf level carbon gain and associated responses to elevated CO₂ were compromised when light and/or water availability was limited by measuring photosynthetic light responses, specific leaf area (i.e. leaf area per mass, SLA), and stomatal density. Elevated CO₂ increased maximum photosynthetic rates, but these effects were negated in decreased light and decreased water situations. Plants grown under reduced light conditions had significantly greater SLA, a change that allows for increased light absorption. Plants decreased leaf stomatal density under elevated CO₂ when water availability was low while light availability had no effect. These results suggest plant responses to elevated CO₂ depend on the availability of other resources such that evaluating interactive effects of multiple environmental factors is essential for predicting ecosystem response to future global changes.

Morgan Marie Laffey, Megan Elizabeth Meller and Kristine Marie Albin (85)

Faculty Mentor/Collaborator: **David Lonzarich**

Histology of Alarm Substance Cells in Relation to Parasite Load and Fish Size for Hornyhead Chub (Nocomis biguttatus)

It is generally thought that alarm substance cells (ASC) in fish epidermis evolved as a means of reducing predation risks via the release of a chemical substance these cells hold. Our previous work has shown in the predatory minnow, creek chub, that individual variability in ASC densities is associated with size, mucous cell density, epidermal thickness, and black spot parasite load (*Neascus pyrifomes*). We are now focusing our attention on the hornyhead chub (*Nocomis biguttatus*) for the purpose of assessing the general nature of the relationships uncovered earlier, especially as it applies to non-piscivorous minnow species. We have collected 50 fish from five regional streams which were histologically prepared (approximately takes two weeks to generate ten slides) and then performed bivariate analyses. Results show a potential relationship between body size and ASC density.

Christopher Alan Monte and Beatrice Rae Soderholm (154)

Faculty Mentor/Collaborator: **Daniel P. Herman**

Prevalence of Methicillin Resistant Staphylococcus aureus in El Oro Province, Ecuador

Methicillin-resistant *Staphylococcus aureus* (MRSA) is an antibiotic-resistant strain of the bacterium *Staphylococcus aureus*. MRSA poses serious health threats on the global scale, accounting for a significant portion of hospital-acquired infections and resulting in thousands of deaths annually. Little published data exists on the prevalence of MRSA in Ecuador, resulting in a poorly understood health impact for the country. In this study, nasal swabs were obtained from patients and staff at a regional hospital in El Oro Province, Ecuador. Health surveys were also conducted to assess risk factors for MRSA colonization. Samples were inoculated onto mannitol salt agar (MSA), and Gram stains, catalase, and coagulase tests were conducted to identify isolates of *S. aureus*. Samples were also inoculated onto MSA containing oxacillin to identify potential MRSA specimens. PCR was performed on these isolates of interest in order to confirm their classification as *S. aureus* and/or Methicillin resistance. Preliminary PCR results indicate that of the 499 samples collected, 72 (14.4%) were *S. aureus* positive. Additionally, 33 (6.6%) samples were MRSA positive. The results indicate that MRSA is a potentially serious health threat in this hospital that warrants further investigation.

Jordan Teal Montpetit, Gavin Reid Sunde and Timothy D. Lauer (133)

Faculty Mentor/Collaborator: **Derek J. Gingerich**

Characterization of an Arabidopsis thaliana Mutant Identified in a Genetic Screen for Altered Red Light Responses

LRB1 and *LRB2* are genes found in the model dicotyledonous plant *Arabidopsis thaliana* which participate in the red-light signaling pathway initiated primarily by the photoreceptor phytochrome B (PhyB). Mutation of both *LRB1* and *LRB2* produces plants that are red light hypersensitive. We wished to identify other genes besides *LRB1* and 2 that participate

in this pathway. We conducted a genetic screen to identify mutations which alleviate the red light phenotype of the *lrb1/lrb2* mutants. A population of *lrb1/lrb2* mutants (in the Col-0 ecotype background) were subjected to random mutagenesis using ethyl methanesulphonate. We screened the next generation for plants which showed suppression of the *lrb1/lrb2* phenotype. One of these mutants, S3-5-2, displays strong red-light insensitivity. To determine the gene disrupted in this line, we conducted a genetic mapping experiment, crossing the S3-5-2 mutant with a Landsberg *erecta* ecotype plant and then tracking the segregation of the S3-5-2 mutation and Col-0/Landsberg markers in subsequent generations. This analysis localized the S3-5-2 mutation to a region near the center of chromosome 2. This region contains the *PHYB* gene. Complementation tests indicate the mutation is likely in this gene. *PHYB* is currently being sequenced in this line to determine the nature of the mutation.

Heather May Pries (106)

Faculty Mentor/Collaborator: **Sasha A. Showsh**

How does MRSA acquire the Methicillin Resistance Gene?

Methicillin Resistant *Staphylococcus aureus* (MRSA) is a bacteria that is capable of causing infections in humans and has of lately become resistant to the drug of choice used to treat it. With our research we are looking at how bacteria acquire this resistance. The genes carrying resistance are found on plasmids which are circular DNA that self-replicate separate from bacterial genome DNA. We collected several possible MRSA samples from the UW-Eau Claire community and after

performing a series of preliminary tests to confirm that they are MRSA, we are left with 11 possible MRSA samples. By performing a plasmid extract on the samples we see that the bacteria do carry plasmids and in fact they appear to carry a diverse population of plasmids which may mean that we have isolated different strains. Further procedures such as Polymerase Chain Reaction (PCR) will help us to genetically identify the samples as MRSA. We will also perform mating experiments with our strains to see if the plasmids carrying the methicillin resistance can be transferred between bacteria. With completing our research we hope to contribute knowledge to what is known about MRSA which may be used to treat or even prevent human infections.

Kristin Lynn Rosche and Emily Marie Thorsen (157)

Faculty Mentor/Collaborator: **Lloyd W. Turtinen**

Knockout of the US29 Gene of Human Cytomegalovirus Using BAC Recombineering

The purpose of our research is to determine the function of the US29 gene in Human Cytomegalovirus (HCMV) by knocking it out using Bacterial Artificial Chromosome (BAC) technology. We began with a BAC that contained the entire HCMV genome as well as the chloramphenicol (Camr) antibiotic resistance gene (ADCRE) in DH10 β *Escherichia coli* (*E.coli*). We isolated the ADCRE from the DH10 β cells and then electroporated it into the recombineering *E.coli* strain SW102 GalK⁻ containing an excision defective λ prophage. Following electroporation, 800 Camr colonies were obtained, of these, 1 out of 25 screened had the entire viral genome based on a DNA fingerprint match between the SW102 and DH10 β strains. The rest had large deletions in the HCMV sequence. A kanamycin resistant, galactokinase positive (Kanr/GalK⁺) cassette was amplified to contain flanking US29 regions using the polymerase chain reaction (PCR). This DNA was electroporated into the SW102 with the intact ADCRE to replace part of the US29 sequence with Kanr/galK genes through homologous recombination (allelic exchange). Sixteen Kanr/Camr/GalK⁺ colonies were obtained, indicating exchange of 956 base pairs in US29 with 2.3kb Kanr/galK.

Sophia Ana Ruff-Berganza and Alexandra Leigh Isaacson (36)

Faculty Mentor/Collaborator: **Daniel S. Janik**

Yohimbine-Induced Circadian Clock Resetting in Mice

Mice are nocturnal animals that exhibit predictable activity patterns controlled by their internal (circadian) clock. We have demonstrated that a mouse's circadian clock can be reset to an earlier time through the administration of yohimbine, a selective adrenergic agonist. First, we determined the effective dose of yohimbine by administering either 1, 5, 10 or 20 mg/kg yohimbine to mice. We found that 5 mg/kg yohimbine induced maximal resetting of about 1.5 hr. Next, we showed that yohimbine's clock resetting effect is dependent on the time of day at which it is administered. While 5 mg/kg yohimbine induced resetting of 1.5 hr when given 6 hr prior to the normal lights-off time, that same dose induced no resetting when given at the time of lights-off. Previous work has suggested that drug-induced clock resetting of the type we are studying can be mediated by both adrenergic and dopaminergic systems in the brain. For that reason we are currently testing whether clock-resetting induced by yohimbine can be blocked by the adrenergic blocking agent propranolol and the dopaminergic blocking agent clozapine.

Aric Anson Runzheimer (152)

Faculty Mentor/Collaborator: **Julie A. Anderson**

Localization of the C. albicans MBP1 Gene Product in C. cerevisiae

The pathogenic yeast species, *Candida albicans*, is responsible for a number of opportunistic oral and genital infections, particularly those of the immunocompromised. Key to its pathogenicity is its ability to convert from yeast to hyphal form upon invasion of human tissue. Research suggests the MBP1 gene product plays a role in this transition. This project continues work carried out by UWEC biology department faculty, Dr. Dan Herman and Dr. Julie Anderson, and former student, Greg Fischer. The *C. albicans* MBP1 gene was expressed in the closely related, less pathogenic, *Saccharomyces cerevisiae*. The regulatory protein, Swi6, combines with the Mbp1 and Swi4 proteins to form the MBF and SBF complexes, respectively, which function as transcription factors. A SWI4⁻/MBP1⁻ double mutant generally results in a lethal phenotype; however, viable strains were isolated, possibly indicating the presence of additional mutations. This project seeks to investigate the nature of these revertants. Key to this investigation is the cellular localization of the Mbp1 protein. If Mbp1 functions as a transcription factor, it should localize to the nucleus. Investigating the localization patterns of the MBP1 gene product will further our understanding of the role it plays in the pathogenicity of *C. albicans*.

Adam Christopher Schneider, Kaitlyn Beaty and Ashley Sheridan (80)

Faculty Mentor/Collaborator: **Deborah Ann Freund**

In Darwin's Footsteps: Surveying, Documenting, and Preserving Biodiversity in the Galapagos Islands

Charles Darwin remarked that natural history is “eminently curious, and well deserves attention.” Since discovery by a wayward Spanish bishop in 1535 the biodiversity of the Galapagos Islands have piqued the curiosity of sightseers and scientists alike. However, in spite of the Galapagos Islands’ importance in the history of science and its mention in nearly every general biology textbook, much is still unknown about the biodiversity of the Islands. Recently, we worked with the Charles Darwin Research Station (CDRS) in the areas of botany, vertebrate zoology, and entomology, improving the natural history collections and making data more accessible to the international scientific community. These efforts included specimen collection, accession, curation, and photography, as well as adding historic survey data into Datazone, the online, publically available database of the CDRS. Our work in the Galapagos is a good example of the supportive efforts necessary for the fundamental discovery-based science that often leads to more complex, hypothesis-driven questions. Furthermore, the success of this project has lead to further collaboration between the CDRS and the University of Wisconsin-Eau Claire, now involving four groups of students from two different departments, Biology and Geography.

Adam Christopher Schneider, Molly Ann Kreiser and Gregory Thomas Nelson (81)

Faculty Mentor/Collaborator: **Tali D. Lee**

With Changing Global Precipitation Patterns, Will the Growth of Prairie Plants be More Constrained by Reduced Rainfall Frequency or Reduced Rainfall Volume?

Water deficits are a common limiting factor of plant growth. Many studies have looked at the effects of drought, but none have independently compared the two ways a plant might experience reduced water availability: fewer rain events, or less water per event. Climate change predictions for the Upper Midwest show a slight increase in total rainfall, but fewer, more severe events. In this greenhouse experiment we investigated responses of the legume *Lupinus perennis* and the grass *Agropyron repens* to 50% reductions in rainfall frequency, rainfall volume, or both. We measured leaf senescence, biomass accumulation, photosynthetic rates, and for *Lupinus*, the amount of N derived from N₂ fixation. Responses varied by species, but in general reduced rainfall volume was found to be more limiting than reduced rainfall frequency. Both types of reduced water availability increased leaf senescence for *Lupinus* although the number of leaves produced was unchanged. Biomass accumulation and N₂ fixation rates were significantly reduced in *Lupinus* grown under decreased volume treatments. However, *Agropyron* plants grew similarly across treatments, which may be explained by improved water use efficiency. In the future, predictions of vegetation responses to climate change could be improved by considering these two dimensions of water availability independently.

John Peter Schoen, Aaron Roderic Devoe, Zachary Robert Snobl and Stephanie Drew Vinetas (105)

Faculty Mentor/Collaborator: **Todd A. Wellnitz**

How Does Velocity and Wood Decay Class Influence Stream Macroinvertebrate Diversity?

Current velocity and submerged wood are known to influence the distribution of benthic macroinvertebrates in streams, but these two factors have not been examined together. To understand how near-bed current velocity and wood decay class influence benthic diversity, we sampled 20 wood surfaces having different velocities in Beaver Creek. Benthic macroinvertebrates were sampled from each wood surface, the decay class of the wood was recorded and near-bed current was measured. We also characterized the ambient benthic community 1 m downstream from each sampled surface. Macroinvertebrates were sorted to the family or genus level and the data were analyzed using t-tests and linear regression. We found 19 different taxa, the most common being the dipteran families Chironomidae and Simuliidae, followed by the caddisfly *Brachycentrus* and the mayfly *Baetis*. Species richness and abundance was significantly greater on wood ($p=0.001$ and $p=0.0004$) and there was a positive correlation between velocity and species richness ($r^2=0.43$, $p=0.002$). However, not all species had the same relationship to current; the mayfly *Heterocleon* sp. was negatively correlated with velocity ($r^2=0.85$, $p<0.05$). There was no effect of wood decay class on the surface suggesting that current was more important for structuring the community.

Kaitlin Heather Snider and Jessica Michelle Joniaux (37)

Faculty Mentor/Collaborator: **Daniel S. Janik**

Efficiency of Verbal and Mechanical Markers for Training a Difficult or Simple Behavior in Pet Dogs

In behavioral science, a marker is a stimulus that closely follows a behavior. The marker is followed by a reinforcer (e.g., a food treat) and helps associate the behavior with the reinforcer. Research in animal training has shown mixed results in whether or not the use of a marker, or “clicker” speeds learning, with a trend for more significant differences in studies

with more difficult or complex behaviors. A “clicker” is also purported to be a better conditioned reinforcer than a verbal marker because it has a shorter sound, is more consistent, and has a particular pitch. To test this idea, 26 dogs participated in a tricks training class. Owners taught dogs a simple behavior (to nose-touch a target) and a complex behavior (putting a toy in a box). Dogs learned behaviors either with a clicker, a verbal marker, or no marker (all groups received reinforcement with treats). We used audio recordings to observe the length, pitch, and consistency of the verbal markers and clickers. If verbal markers are less efficient as than clickers because of their auditory characteristics, then we expect to see a significant correlation of one or more acoustical traits of markers with faster learning.

Zachary Robert Snobl (104)

Faculty Mentor/Collaborators: **Todd A. Wellnitz** and **Eric C. Merten**

Logjams: A Look at Logjams and Emergent Wood Effects on Insect Emergence in a Small Northern Minnesota Stream

Wood performs vital functions in streams, such as trapping organic matter and creating pools. Less is known about how logjams affect insect emergence. We hypothesized that the presence of wood and physical factors would increase the diversity of the emergent insect community. This study sampled a 40-m section of a small stream in Northern Minnesota, centered on a spanning logjam. During May, July, and August 2010, we assessed 50 random locations on the 40-m stretch. We measured the stream’s physical characteristics in these locations by quantifying substrate types, water depth, current velocity, and both emerged and submerged wood. Emergence traps deployed at each site yielded 51 emerging insect taxa. Nonmetric multidimensional scaling showed that areas with wood had a more diverse community composition of emerging insects. This analysis also showed that the presence of wood affected several factors such as depth, substrate, and CPOM, which changed the emergent community composition. Our data supports the notion that logjams and wood may have a vital role in increasing niche space and the emergent community’s diversity.

Kaleigh Spickerman and Kimberly Anne Drewiske (107)

Faculty Mentor/Collaborator: **Evan R. Weiher**

Taxonomic and Functional Beta Diversity in a Forest Mosaic and its Implications for Community Assembly

Communities that are assembled stochastically should have greater beta diversity (the amount of variation between two or more communities) than communities that are assembled mainly through deterministic niche processes. Few studies have investigated this therefore, we did so in a forest mosaic located at Beaver Creek Reserve in Eau Claire County. We established 21 releve points that captured variation in tree canopy cover and soil moisture. At each point we had five sample plots from which we collected leaves from each species present and assessed their functional traits. Species percent cover was estimated visually and various environmental data were collected. Beta diversity within each releve was measured using several distance measures for both taxonomic and functional beta diversity. Preliminary results suggest that both taxonomic and functional beta diversity were largely independent of the light and moisture gradients, as well as measures of environmental heterogeneity. Even so, the ratio of taxonomic beta diversity to functional beta diversity increased with shading and tree canopy cover. This suggests that drought stress in the open, sandy areas caused relatively greater niche-based assembly, while the reduction of stress in the shaded understory caused increased stochastic assembly.

Kaleigh Spickerman, Christopher Nolan Maierhofer, Joseph J. Weirich and Christopher Michael Wojan (108)

Faculty Mentor/Collaborators: **Todd A. Wellnitz** and **Evan R. Weiher**

Stochastic vs. Niche-based Processes: What Drives Lichen Community Assembly Following Fire Disturbance?

Chase (2007) predicted that communities subjected to disturbance should follow niche-based assembly rules and display greater similarity and lower beta diversity. Conversely, undisturbed communities will be subject to stochastic processes and be less similar. To test this, we examined the response of lichen communities in the Boundary Waters Canoe Area Wilderness to fire disturbance. Lichen communities were sampled within and outside regions burned by the Cavity Lake Fire of 2006. Ten sites were selected, 5 within and 5 outside the burn. Each site contained 4 sample areas, giving 20 areas for each treatment and 40 samples total. Species abundance, substrate type, canopy cover and dominant vegetation were recorded and data were analyzed using ANOVA and PCoA ordination. Jaccard’s distance was used to compare the degree of community similarity among communities. Burned communities were more similar than unburned communities ($p < 0.001$). The mean distance from the centroid of community composition was 80% greater in the unburned plots than in the burned plots. Burned areas showed lower species abundances and diversity as compared to unburned communities. These data support Chase (2007) and suggest that fire disturbance enhanced niche-based processes in lichen assemblages, whereas stochastic processes were more important in unburned areas.

Gavin Reid Sunde, Jordan Teal Montpetit and Timothy Donald Lauer (132)

Faculty Mentor/Collaborator: **Derek J. Gingerich**

A Genetic Screen Identifying Mutations which Suppress the Phenotype of a Red Light Hypersensitive Mutant

Little is understood of the red light signaling cascade in plants. Our project aims to both increase knowledge of the cascade and discover new genes involved in it. We conducted a genetic screen based on two genes (*LRB1* and *LRB2*) previously shown to act in this pathway. Plants with disruptions of these genes are hypersensitive to red light. We mutagenized a population of *lrb1/lrb2* mutants and then conducted the screen under red light to identify mutations which alleviated red light hypersensitivity. This screen identified more than 100 mutants. We have been performing detailed phenotypic analyses of them by measuring hypocotyl length, cotyledon expansion and cotyledon angle under different levels of red light. Having analyzed about 30% of the mutants, we find many showing interesting light phenotypes. We will continue analyzing the mutants and begin mapping the mutations to specific genes.

Stephanie Drew Vinetas and Ashwin Manikandan Sasidharan (128)

Faculty Mentor/Collaborator: **Todd A. Wellnitz**

Seasonal Dynamics in a Northern Minnesota Stream

Streams are dynamic ecosystems in which physical factors such as temperature, depth, and velocity change throughout the year. Benthic algae, which provide food for many invertebrates and form the base of many stream food chains, can respond to these factors. To understand how seasonal change influenced benthic algae, we examined how algal abundance responded to variation in streambed temperature, current velocity and stream depth in early and late summer. We sampled 50 random locations around a stream logjam in Cabin Creek, a northern Minnesota stream, during May and August of 2011. Temperature, velocity and depth were recorded at each location and chlorophyll was extracted from streambed substrates to estimate algal abundance. We found that the relationships between physical parameters and benthic algae seen in May disappeared in August. In particular, benthic algae had a positive correlation to depth and a negative correlation to temperature in May, but no relationships occurred in August. August also showed less algae, slower current velocities and shallower stream depths ($P < 0.0001$ for each parameter). We propose that the May patterns disappear in August because the stream environment becomes physically more homogeneous as stream water levels drop in late summer.

Christopher Michael Wojan, Aaron Roderic Devoe and Zachary Robert Snobl (130)

Faculty Mentor/Collaborators: **Todd A. Wellnitz and Eric C. Merten**

Riparian Spider Response to Logjam-Mediated Aquatic Emergence

Web-building spiders near streams have been shown to be positively correlated with aquatic insect emergence, and emergence is linked to benthic productivity. Logjams, or accumulations of wood in streams, can increase aquatic macroinvertebrate production through organic material retention and habitat diversification. Thus, we hypothesized that there would be an increase in spider density situated near logjams. To test this, spider webs were counted within 6 m of the stream bank of a 40-m reach in a northern Minnesota stream in late May and late August of 2011. In addition, the availability of web-building substrate and structure was estimated (Web Space Index, or WSI). Additionally, emergent insects were quantified using randomly-placed wooden emergence traps. Both May and August showed a steep decline in web number with increasing distance from the stream ($P < 0.001$). Webs in May were heavily concentrated around the logjam, whereas the August webs were dispersed throughout the reach. The WSI did not show a strong correlation with web density in May, but it had a significant effect in August. These results suggest that prey cluster around logjams and are limiting in May, but become more abundant and dispersed in August, and web-space becomes the limiting factor.

Ong Xiong (129)

Faculty Mentor/Collaborators: **Todd A. Wellnitz and Eric C. Merten**

How Do Functional Feeding Guilds Respond to Habitat Distribution?

Macroinvertebrates mobilize energy and nutrients through stream food webs. They can be classified by feeding strategy into functional feeding guilds (FFGs): scrapers, filterers, gatherers, shredders, and predators. FFGs differ by their primary food resource, and by their common morphological or behavioral traits. We hypothesize that FFGs will respond uniquely to different habitat variables. To test this, we studied Cabin Creek in Superior National Forest, where we surveyed the benthic (stream-bed) macroinvertebrate community and stream habitat of a 40-meter reach. We used structural equation modeling to determine habitat variables that modify the distribution of each FFG and to identify variables that affect multiple FFGs. Wood and water velocity were the most important habitat variables among the models. Wood and velocity alone were sufficient to explain the distribution of filterers, gatherers, and scrapers—with varying effects on each. Predator distribution

was driven by prey abundance, while shredders were associated with aquatic plants. These results indicate that FFGs indeed differ in their selection of habitat. Given that each FFG participates in the cycling of energy and nutrients from different food resources, this may have consequences for the spatial distribution of stream processes across benthic landscapes.

Ryan Harrison Ziegler and Jordan Teal Montpetit (131)

Faculty Mentor/Collaborator: **Derek J. Gingerich**

Genetic Enhancer Screen to Identify Red Light Hypersensitive Mutants in the Model Plant Species Arabidopsis thaliana

LRB1 and *LRB2* are genes that participate in the red-light signaling pathway in the model plant species *Arabidopsis thaliana*. Mutations in both *LRB1* and *LRB2* cause red light hypersensitivity in these plants. Along with *LRB1* and *LRB2* we hoped to identify additional genes that also play a role in the red-light pathway. To do this we have conducted a series of genetic enhancer screens to identify mutations which exacerbate or enhance the phenotypic characteristics of the *lrb1/lrb2* mutants. For this screen *lrb1/lrb2* mutants were subjected to random mutagenesis using ethyl methanesulphonate. Following mutagenesis the M2 generation of plants were germinated and grown briefly under very low levels of red light and putative mutants were identified based on an enhanced *lrb1/lrb2* phenotype. To further test and verify for red light hypersensitivity seed obtained from these lines was plated, germinated, and grown under low red light and in the dark. Thus far, based on these screens, we have identified one line, E2-1-2, which may be a *bona fide* light mutant. This screen is ongoing and we anticipate identifying more mutant lines.

Gregory Thomas Nelson and Molly Ann Kreiser (82)

Faculty Mentor/Collaborator: **Peter Wragg, University of Minnesota**

External Collaborators: **Peter Blum, Appalachian State University, Gretchen Wilbrandt, Cedar Creek Ecosystem Science Reserve, East Bethel, MN, and Stephanie Erlandson, University of Minnesota**

Pollination Ecology of Aclepias ovalifolia

Ants have traditionally not been considered effective pollinators of milkweeds due to their inability to remove pollinia. Our observations of an ant species *Formica obscuripes* successfully removing pollinia of the oval-leaved milkweed *Asclepias ovalifolia* motivated us to test the ability of these ants as pollinators for this milkweed. To do this, we imposed three insect-exclusion treatments (“no insect,” “ant only,” and “all insect”), and recorded subsequent removal and deposition of pollinia, fruit set, and seed set. Inflorescences were observed to determine visitation rates and some insects were captured for pollen load analysis. We found that of all insects, ants visited flowers at the highest rate and on average each ant carried at least one pollinarium. When compared to all insect visitors, ants alone removed similar numbers of pollinaria but deposited fewer. Ant-only plants also had a lower fruit set than all insect plants, and fruits on ant-only plants produced no viable seeds. These results suggest that ants act as antagonists rather than mutualists. Through direct and indirect interference on multiple stages of the reproductive process, ant visitation may have negative impacts on the reproductive success of *A. ovalifolia*.

PHYSICAL SCIENCE

MATERIALS SCIENCE CENTER

Samuel Bryan Emmons (267)

Faculty Mentor/Collaborator: **Douglas J. Dunham**

Conductive Atomic Force Microscopy: Applied and Modeled

Atomic Force Microscopy is an increasingly powerful tool available for use in the effort to characterize the nano-scale world. Many modes of analysis are available for a variety of applications, including topography, force mapping, lithography, Conductive AFM, Photoconductive AFM, magnetic force, imaging in fluid, and more. We have studied and applied a variety of these modes of operation. In some modes of operation, such as Conductive AFM, or CAFM, the microscope tends to give only a qualitative picture of what the electrical properties of the surface are. We are working using tools such as the theories of Classical Electrodynamics and the modeling and computation program Maple to develop models and methods to approach CAFM more quantitatively. The methods presently available are Conductive Mapping of the surface and Current vs. Voltage plotting at a single point on the surface. With these resources we will be able to address the electrical properties of a sample surface in a more numerically accurate way, in addition to the great qualitative data the AFM can already bring to the table in conductive mode.

Jason A. Leicht, Caramon Alexander Ives and Bret D. Meier (268)

Faculty Mentor/Collaborator: **Douglas J. Dunham**

Fabricating SiC Nanowires for Nano Switches in Energy Saving Applications

With the current information age, the usage of electronics will not be declining in the foreseeable future. Many electronics consume energy even when turned off; nanoswitches allow electronics not to suffer from this issue. SiC has been proven to be a viable option for the construction of nanoswitches because of its unique electrical properties. The proposed nanowire growth mechanism involves Si and FeSi in a non-oxygenated environment at high temperature. The iron serves as a catalyst and is retained after the reaction in elemental form. Our analysis technique involves elemental and visual analysis on Scanning Electron Microscope (SEM) and Auger probes, revealing wires on the nanoscale. Our process is currently being refined to provide more consistent growth of SiC nanowires on a larger scale.

PHYSICS AND ASTRONOMY

Junbin Cao (270)

Faculty Mentor/Collaborator: **George J. Stecher**

Accelerometer Measurements of Water Rocket Motion

The prices of accelerometers and micro-controllers have dropped dramatically in recent years. They can now be used in experiments that were previously too expensive to conduct. We have used these devices to measure the acceleration of water rockets. Our purpose was two-fold: to study the suitability of the electronic devices for physics projects and to understand the flight of the rockets themselves. We compared our results with a theoretical model developed by Peter Nielsen of the University of Queensland. Our data were in excellent agreement with Nielsen's theory, although we did vary one parameter, the air pressure (which we could not accurately measure), to get that agreement. We conclude that inexpensive micro-controllers and accelerometers can be used to make acceleration measurements of rockets in flight (and very likely many other systems as well). In addition, our data confirm Nielsen's theoretical model of water rocket flight.

Gregory James McGill (283)

Faculty Mentor/Collaborators: **Matthew M. Evans and Kim W. Pierson**

LabVIEW Controlled Laser Spirograph

Mathematical functions can be represented through formulas and visualized with diagrams showing their results for specific input parameters. This is often a static presentation that is hard to interpret. With a laser spirograph, which uses mirrors attached to motors and reflects a laser beam, these functions can be more easily changed and visualized. The spinning mirrors work together to create a rotating pattern which is projected onto a screen. A LabVIEW program allows a user to control the motors speed, where different speeds change the pattern that is produced, similar to changing the input parameters for the function. The created laser patterns can be matched to mathematical models in the form of parametric equations. This work will compare the physical pattern with a computer generated model having the same input parameters to observe differences and similarities between the two methods.

Thomas David Nevins (284)

Faculty Mentor/Collaborator: **Thomas E. Lockhart**

Formation of Antibubbles in Oil Systems

Antibubbles are structures in which a core of liquid surrounded by an air film is suspended in a bath of that same liquid. These structures can affect mixing of liquids when poured. Antibubble formation has been well studied in soapy water systems, but not in single component systems such as oil. In either type of system, a jet of liquid strikes a bath of the same liquid. For a range of jet speeds, antibubbles can form if instabilities in the flow occur. High speed video is used to illustrate the various steps in the process of antibubble formation in an oil system and some of the parameters controlling the dynamics of the process are measured from these videos. The disturbances in the jet necessary for antibubble formation in the oil system are studied in detail.

Erik James Olson (282)Faculty Mentor/Collaborator: **Kim W. Pierson***Robot Navigation using LabVIEW Vector Field Histogram Algorithm*

For autonomous robots, navigating through buildings to specific spots selected within that building can be difficult. If this could be accomplished, it would allow myriad of menial tasks to be performed more efficiently than humanly possible. The specific purpose of this project was to design a program for the National Instruments Single-Board RIO robot that navigates buildings, given only start and end points, using Vector Field Histogram as obstacle avoidance and path finding algorithms. The process of design was iterative: first we designed the program algorithm, second we observed problems that the robot encountered, hypothesized possible causes, and adjusted the program. Much of the design process was software based however we also redesigned the robot's outer structure resulting in fewer slips with turns. Results of this research show that successful autonomous navigation of the robot can be achieved, but the effectiveness of the algorithm depends on accuracy of data acquired by sensors and physical layout of buildings. Dead ends, very narrow passageways, and undocumented objects along the path can increase the number of maneuvers made, increasing the inaccuracy of the robot's calculated position information. Future improvements include processing images acquired with cameras so that the robot can recalibrate position.

Frederick J. Paffel (269)Faculty Mentor/Collaborator: **Elisha F. Polomski***Infrared Observations of a Mira Variable in the M33 Galaxy*

Our goal was to determine if a bright infrared source in the M33 Galaxy was a Mira Variable by comparing its infrared data to that of two known Mira stars. A Mira Variable is a star in the late stages of stellar evolution. Their brightness changes periodically and they expel large amounts of matter that surrounds them making unique absorption bands. Using infrared data from available space and ground telescopes, data was collected on each of two known Mira Variable stars. The first comparison star is Omicron Ceti as it is the first known Mira Variable and the second is OH26.5 +0.6, an extreme Mira that appeared to be similar to our test star. Data was also collected on the bright infrared source, IRAC 0134. From the infrared data we obtained, we graphed the measured flux density versus wavelength. Using data from the three stars, we constructed Spectral Energy Distributions of each star. From this, spectral features including absorption bands and emission lines were compared. Normalizing the graphs and comparing them to one another, we were able to infer that the stars are in similar stages of stellar evolution, meaning IRAC 0134 is probably a Mira Variable.

Charles Mark Rowe (271)Faculty Mentor/Collaborator: **George J. Stecher***Application of an Accelerometer to a Rigid Pendulum*

The costs and sizes of accelerometers and microcontrollers have dropped significantly in the last several years. We tested a microcontroller-accelerometer combination on a well-understood system, the rigid pendulum, in order to determine if this new generation of electronic devices allows *in situ* measurements of acceleration. Our data agreed closely with the theoretical predictions, and we conclude that the new accelerometers and microcontrollers are effective tools for studying the acceleration of dynamic systems *in situ*.

SOCIAL SCIENCES

ACCOUNTING AND FINANCE

Bryce Donald Dankers (90)Faculty Mentor/Collaborator: **Ling Liu and Nan Hu***CEO Media Exposure and Cross-Sectional Stock Returns*

For the research that we conducted, the specific question we addressed is whether CEO's media exposure affects his/her firm's security return when firms have good versus bad corporate merger and acquisition news. This project relates to the accounting profession because of the research question, research design and the different independent variables used in it: such as free cash flow, leverage, technology industry control, public firms, private firms, and size of the company, and so

on. The way that we approached this research project is to attain financial information of about 1500 corporations and test the effect of their CEO's media exposure on firms' cross-sectional stock returns. Based on several methods in literature, we partition firms into two groups: firms with good or bad merger and acquisition news in order to run the regression separately. We use total goods news and total news as independent variables to test our results respectively. No matter with or without the corporate governance control variable, we reached robust research results: Regardless of the CEOs' media exposure level, as long as firms have bad merger and acquisition news the market punishes the firms' stocks, the contrary market will reward firms with good merger and acquisitions news.

Dian Zhang (91)

Faculty Mentor/Collaborator: **Nan Hu** and **Ling Liu**

External Collaborator: **Xu Li, Lehigh University**

The Impact of CEOs' Accounting Backgrounds on Earnings Management and Accounting Conservatism

This paper investigates the impact of CEOs' accounting backgrounds on firms' earnings management and accounting conservatism. This paper contributes to the field of accounting in that it is the first study to investigate the impact of CEOs' accounting backgrounds on firms' financial reporting policy. We obtain CEO educational backgrounds from the BoardEx database. The financial-related information for the companies is obtained from the Compustat database and the stock return data from the Center for Research in Security Prices (CRSP). Consistent with the hypotheses developed from the experimental accounting research, we find that firms with CEOs having accounting backgrounds are associated with lower levels of accounting conservatism, but not with higher levels of income-increasing discretionary accruals.

COMMUNICATION/JOURNALISM

Grace E. Collura (2)

Faculty Mentor/Collaborator: **Won Yong Jang**

Mobile Communication and Lovers

The purpose of this study was to examine the theory that a relationship exists between the use of text messaging and romantic relationships. A Qualtrics Survey was taken by 192 participants between the ages of 18-26 years. A correlational analysis of text messaging and relationship satisfaction was conducted to determine the relationship between the two variables. A Chi-Square analysis was also run to determine a relationship between frequency of texting and relationship length. Neither hypothesis was supported within this study. However future research should be conducted in order to determine more information on the topic of text messaging and its influence on relationships.

Amy Jo Fredman (11)

Faculty Mentor/Collaborators: **Nicole Schultz** and **Mary F. Hoffman**

"Change Won't Happen Without You": An Analysis of Online Volunteer Recruitment

In 2011, 64.3 million people, or 26.8 percent of American adults volunteered with nonprofit organizations (Bureau of Labor Statistics, 2011). Although many scholars have studied the experiences of volunteers (Clary & Snyder, 1999; Haski-Leventhal & Meijjs, 2011; Laverie & McDonald, 2007; Mowen & Sujun, 2005), this study seeks to understand the recruitment strategies used by organizations via their websites. To that end, the rhetorical methodology of cluster analysis was used to examine websites from an annual listing of 50 largest nonprofits by income, as reported by *The Nonprofit Times* (Roberts 2010). Tenets of identity rhetoric (Hoffman & Ford, 2010) guided the research. Analysis revealed that volunteer organizations use three recurring recruitment strategies to cultivate organizational identity with potential volunteers: (a) positive descriptions of current and potential volunteers; (b) language choices that create connections between volunteers and organizations; and (c) messages that emphasize the benefits of volunteering. Based on this analysis and relevant literature, recommendations are made for strategies that may be more effective in recruiting volunteers via websites.

Natalie Annette Hunter, Elizabeth Kennerly Cantwell, Lindsey Mae Schumacher, Courtney Elizabeth Blunt, Angela Marie Salentine and Sara Nicole Severson (27)

Faculty Mentor/Collaborator: **Martha J. Fay**

Victoria's Secret Symbolic Communication: Exploring the Connection between Brand Images, Organizational Communication, and Job Satisfaction

The effect of advertising on attitudes and behavior has been studied (Yaniv & Farkas, 2005), but less is known about how advertising may impact employees. Research has shown that a company's advertisements are related to an employee's perceived organizational identification and job satisfaction (Dutton, Dukerich & Harquail, 1994). Images of an organization shape how members define themselves (Dutton & Harquail, 1994) and their attributes. Past research has shown that focal organizational attributes that are consistent with members' attitudes lead to higher perceived levels of organizational identification and job satisfaction. However, limited research has been conducted examining whether negative or controversial organizational images as well as failure to identify with core values (images) of an organization contribute to lower levels of job satisfaction and organizational identification. This study examined associations between the symbolic communication of Victoria's Secret and employee perceptions of similarities with models used in brand advertising (using the Perceived Homophily scale, McCroskey, Richmond & Daly, 1975), and the employees' organizational identification (using the Organizational Identification scale, Cheney, 1883), and job satisfaction of employees (using the Job in General Scale (Smith, Kendall and Hulin, 1969).

Olivia May Jeske (43)

Faculty Mentor/Collaborator: **Michael D. Dorsher**

Making an Informed Decision between Journalism and Public Relations

The goal of my research project is to assemble the necessary information for a student who is choosing between the careers of journalism and public relations and to present the facts in a comprehensible way. The idea for this project developed from my own personal circumstances: so while there has not been extensive background research into the area, there are certainly students around the country who can relate to this decision. It is important to note that the news industry is currently in a downswing, while the PR industry is growing (as this has an impact on the career data comparison). In order to gather what I deemed as the most useful information about each career, I collected data from various websites in addition to interviewing two students, two professionals, and two professors. The individuals I spoke to provided their opinions about various aspects of their professions, which offered an additional insight into each career. As a result of my extensive research, I have created a graphical representation of the comparison of journalism and public relations. It is my hope that by considering the information I have presented, communication students can select between the two careers with enlightened confidence.

Katie Lynn Johnson and Casey Thomas Coughlin (4)

Faculty Mentor/Collaborator: **Nicole Schultz**

Unraveling the AIDS Quilt: A Study in Oppression

An estimated 40,000 Americans contract HIV every year, half of them under the age of 25 (Centers for Disease Control, 2001). "The Quilt... a memorial, a tool for education and a work of art, the Quilt is a unique creation, an uncommon and uplifting response to the tragic loss of human life (The Names Project Foundation, 2011)." This study is grounded in frameworks of multicultural feminism, critical theory, and cognitive dissonance theory, all of which are used to reveal influences of activism and influence inherent with the artifact. Data was collected via a face-to-face semi-structured interviewing technique and thematic analysis was used to identify aspects of recurrent themes, repeated phrases, and forceful/meaningful references throughout participant responses. The findings of this analysis are presented via a creative scholarly works project culmination of a short documentary introducing the AIDS quilt and highlighting brief personal narratives and interview testimonials from a variety of University, local, and state resources (e.g., AIDS Resource Center of Wisconsin; UWEC Women's and LGBT Resource Center; UWEC Student Health). Based on this analysis, recommendations are offered regarding strategies for generating more inclusive and safe communicative environments surrounding personal physical and sexual health and safety conversations and choices.

Kelsey Lynn Kemper, Eric Douglas Cox and Hannah Jane Von Bank (12)

Faculty Mentor/Collaborator: **Martha J. Fay**

Communicating CSR Across Cultures: A Comparison of U.S. and Japanese Websites

Given the increasing importance of globalization, tailoring a message to individual markets is becoming a common occurrence for businesses with multinational representation. Many foreign companies are present in the United States and many American companies are abroad. Yet some corporate activities have not been examined for how they may or may not work across cultures. One of those activities is Corporate Social Responsibility (CSR). This study explores CSR in an intercultural context using a cross-cultural comparison of the websites of Cargill and Bank of America Merrill Lynch, two U.S.-based firms with a significant business presence in Japan that serve distinct groups of stakeholders. Using a Grounded Theory approach (Glaser and Strauss, 1967), we coded the United States and Japanese market websites of both firms to uncover patterns in how CSR efforts are communicated. Then we overlaid Hofstede's (2001) Cultural Dimensions framework to determine its utility as a tool to guide companies' efforts in producing CSR messages for different cultures.

Kara Nicole Koerner, Leah Katherine Knutson, Brianne Nicole Schwarz, Nicholas James Goffard, Kelsey Robyn JuVette and Alyssa Suzann Molbeck (13)

Faculty Mentor/Collaborator: **Martha J. Fay**

Transformational Leadership Between Peers

Although studies suggest that transformational leaders have a profound impact on followers (Dvir, Eden, Avolio & Shamir, 2002), followers who exhibit transformational characteristics and their effect on other followers remain unexplored. The effect that followers have on each other can influence job/school satisfaction, self-efficacy, self-esteem, and organizational identification, as has been shown with transformational leaders and followers (Bandura, 1986, as cited by Shamir, House, & Arthur, 1993; Conger & Kanungo, 1998, as cited by Bartram & Casimir, 2006). Using a survey distributed to participants in both academic and corporate settings, this study examined associations between follower transformational characteristics and job/school satisfaction, self-efficacy, self-esteem, and organizational identification. The findings of this study suggest that just as transformational leaders have a positive influence on their followers, followers with transformational characteristics have a positive influence on other followers. The influence followers with transformational characteristics have on other followers can elevate the collective performance of the organization while enhancing individuals' experience of work.

Michelle Anne Manthey, Emily Carol Bowen, Kayla Rae Dallin, Kelly Alison Todd and Amanda Ann Richert (20)

Faculty Mentor/Collaborator: **Martha J. Fay**

Professional Networking: Involvement and Identity

Professional networking has been shown to benefit individuals' careers in many ways (Forret & Dougherty, 2004). However, little is known about the relationship between individual and employer motives for either encouraging or discouraging involvement in these organizations, which may influence employees' attitudes toward their employer, their identification with their employing organization, and the source with which individuals most strongly identify. Organizational identification is important for both individuals and their employers, as it has been linked with such outcomes as intention to stay and job satisfaction (Masterson & Stamper, 2003; Foreman & Whetten, 2002). Using a questionnaire distributed to professional networking organization members, this study explores relationships between these variables within the event planning industry, an area in which networking is an essential aspect of the job. An understanding of the associations between employer encouragement, reasons that employees are motivated to be involved, employer encouragement of their involvement, and individual identification with their employer and their career, can contribute to important work-related experiences that impact both employers and employees, and may help professional organizations in their efforts to benefit members.

Britta Marie Marquand and Chelsea Rebecca Jacobson (5)

Faculty Mentor/Collaborator: **Judy Rene Sims**

Cultivating Cultural Intelligence through Study Abroad: Mindful Communication, Knowledge of Cultural Values, and Sojourner Adaptation Skills

Cultural intelligence involves developing a mindful approach to intercultural interactions, building adaptive skills, and acquiring a repertoire of behaviors enabling effectiveness in intercultural situations. This research explores how study abroad cultivates *cultural intelligence*, awareness of communication styles, behaviors (verbal and nonverbal), and values, and how experiences of culture shock and re-entry shock related to study abroad stimulate the learning of adaptive skills. A questionnaire administered to a random sample of 374 study abroad students resulted in a response rate of 61% and a

questionnaire completion rate of 71%. Data were analyzed with the Statistical Package for the Social Sciences. Qualitative data were content-analyzed; reliability coefficients were calculated. Preliminary results suggest positive correlations indicating significant linear relationships between the influence of study abroad on awareness of communication styles, behaviors, values, and major changes in the development of *cultural intelligence*. The data reveal statistically significant relationships regarding the correlation between re-entry shock and changes in identity, the learning of adaptation skills, and major changes in the development of *cultural intelligence*. This research illuminates how study abroad cultivates the competency of *cultural intelligence*; it provides valuable knowledge about the relationship between re-entry shock and changes in identity and the learning of adaptation skills.

Britta Marie Marquand (28)

Faculty Mentor/Collaborator: **Martha J. Fay**

Politics, Education, and Student Voice

Many states are facing unprecedented budget shortfalls, and elected officials are implementing a variety of solutions to the problem. Cuts to education directly affect educators at all levels and will likely affect students as well. Announcement of proposals viewed as harmful to faculty has created a charged atmosphere on college campuses across the country, with some faculty and staff, union members and representatives, and students staging protests and rallies primarily opposing budget cuts to education and elimination of collective bargaining for faculty. However, significant support for these same proposals exists in society in general. This study examines relationships between student perceptions of how these issues are addressed in classrooms, perceptions that professors want to know what students think, beliefs about whether an individual's position reflects the majority, and whether students feel free to express their opinions to their professors. Results extend the utility of the spiral of silence theory beyond hypothetical situations to an authentic context, and remind faculty that student voice—whether it aligns with one's own or not—is not only an essential component of liberal education but may be a useful barometer of a society's attitudes and opinions.

Shelley Marie Mather, Sarah Edlund, Nikki Michaels, and Tom Baumgart (216)

Faculty Mentor/Collaborator: **Nicole J. Schultz**

Facebook, Friends, and Fear: An Analysis of Communication Barriers, Apprehensions, & Gratifications

The purpose of this study was to expand on the research of social networking that has already been done. This research focused primarily on barriers, apprehensions, and gratifications relative to Facebook. The study surveyed 333 Facebook users and non-users in order to understand why people do or do not use Facebook. Barriers of using or not using Facebook were identified by respondents and then separated into generational cohorts in order to find common themes. Apprehensions and gratifications of Facebook users were also explored in order to find generational differences in its use. An ANOVA statistical test revealed that Generation X and Generation Y reported significantly more gratification in the area of entertainment from Facebook use than Baby Boomers. Baby Boomers also reported significantly less interpersonal utility gratification from using Facebook than did Generation X and Generation Y. The study revealed a correlation between the frequency of the use of Facebook and communication apprehension.

Michael John O'Brien, Brianne Elizabeth Treffert and Jenna Rose Pasch (25)

Faculty Mentor/Collaborator: **Martha J. Fay**

Patient Attributes and Trust in Physician (Medical Health Care Provider)

Research has shown that patients' trust in physicians may affect their willingness to follow prescribed medical treatments, and therefore their overall health outcomes (Fiscella, Meldrum, Franks, Shields, Duberstein, McDaniel, Epstein, 2004). The patient-physician relationship is influenced by multiple sources; research has focused on characteristics of the physician (Duberstein, Meldrum, Fiscella, Shields, Epstein, 2007), but the patient's attitude and characteristics are also an essential contributor. A survey outlining patient-physician relationship focusing on trust was administered to 94 people of various ages via Facebook and email. This study focuses on patient self-disclosure (Wheeless, 1978), self-esteem (Rosenberg, 1965), willingness to communicate (McCroskey & Richmond, 1985), the levels of perceived homophily (McCroskey, Richmond, & Daly, 1975) between the patient and physician, and trust (Wheeless, 1977) in physician. It is hypothesized that patients who communicate more openly and honestly in everyday contexts, and who have higher levels of self-esteem, are more likely to trust their physicians. Results can be used to foster a more trusting relationship between patient and physician, therefore enhancing the patient's overall health outcomes.

Mara Colleen Pearson and Samantha Lynn Peterson (44)

Faculty Mentor/Collaborator: **Martha J. Fay**

Employee Volunteerism and Message Framing

Corporate social responsibility (CSR) is an increasingly valued business practice in contemporary American society. One manifestation of CSR is employee volunteerism. Company volunteer policies vary greatly both in the degree of expectations for employee volunteerism, and in the way these policies are communicated to employees. This study examines possible associations between employees' perceptions of the nature of their organization's policies on volunteering (mandatory versus non-mandatory) and the ways this policy is communicated, and the outcomes of organizational identification (Cheney, 1983) and job satisfaction (Smith, Kendall & Hulin, 1969). An online survey was used to determine how companies communicate policies and employee attitudes toward volunteering. Results will increase understanding of how messages about employee volunteer programs are framed and the effect such messages have on employees.

Candace Rose Solheim, Shay Elise Wegner, Eden Renae Tande and Katie Marie Dalzell (26)

Faculty Mentor/Collaborator: **Martha J. Fay**

Informal Communication and its Relation to Employees, Managers and Job Satisfaction

Informal communication can be defined as real-time, unplanned and interpersonal interaction that is likely to occur when people actually 'bump' into each other (Andrea, Arnaldo, & Romano, 2011). Past research has shown that informal communication in the workplace is associated with important organizational and individual outcomes, such as job satisfaction (Adams, Jex, & Nielson, 2000). However, little is known about the degree to which managers allow informal communication amongst employees in the workplace. Furthermore, little to no research has been conducted from an *employee's* point of view regarding the degree to which their managers allow informal communication and how this affects their job satisfaction. Using a survey methodology, this study focuses on how employees' job satisfaction relates to their perception of the degree to which managers encourage informal communication within the work environment. We hypothesize that the extent to which managers encourage employees to interact informally is associated with job satisfaction; results can be used to demonstrate the importance of managers encouraging informal communication in the workplace.

Samantha Nichole Thompson (1)

Faculty Mentor/Collaborator: **Won Yong Jang**

Mediated Public Diplomacy: How News Agencies Cover Global Climate Change

This study aims to uncover how various world news agencies are framing the widely discussed and controversial issue of climate change. Media framing is employed in news stories as a means to channel dominant ideologies and national interests into the public and the society, therefore setting the agenda for public discussion and influencing public opinion toward environmental risks. Given the important influences that global warming news coverage may have on public attitudes and policy, this study assesses various research questions regarding themes, sources, and geographic regions mentioned in news articles pertaining to global climate talks. To answer such questions, this study combines a quantitative content analysis with a qualitative assessment of the overall framing in the news of global climate change. Results show how Global South agencies differ in their interpretation of the same events compared to the Global North Press. This information is necessary in understanding the nature of current media coverage and its role in global public diplomacy.

Lacey Jan Weninger, Megan Rose Roltgen and Brita Kathleen Dallmann (3)

Faculty Mentor/Collaborator: **Michael D. Dorsher**

Peru to Wisconsin: Weaving on the Web

Three Spanish-speaking journalism students and their professor traveled to Peru for three weeks to immerse themselves in the culture and later use their English-speaking and writing skills to communicate their intercultural experience to an online audience for a project titled "From Peru to Wisconsin: Weaving on the Web." Spanish and journalism skill sets were necessary in completing this task and all three students have either a major or minor in both Spanish and journalism. In order to carry out the project, students used a diverse combination of information-gathering techniques, including photography, video and audio recording, and face-to-face interactions. The researchers traveled across southern Peru with a group of about 20 tourists to observe the impact ArtAndes, a small business owned by Melanie Ebertz, has had in the lives of various Peruvian weavers and their families. After returning to Eau Claire, the students sifted through the information they had gathered and created a multimedia website documenting their experiences. In their reflections, the students found the ArtAndes trip to be a unique experience in that the group meets and interacts with real Peruvians in their homes and realizes a cultural exchange is possible without knowledge of the native language.

DEAN OF STUDENTS

Abigail Lee Nygaard, Elizabeth Ashley Harris and Virgil Ward (124)

Faculty Mentor/Collaborator: **Shelly M. Voegeli**

Blugold Beginnings Multicultural Learning Community: A Comparison of Campus Involvement and Persistence

The Blugold Beginnings Multicultural Learning Community (BBMLC) was developed to facilitate the transition into college for minority students attending the University of Wisconsin-Eau Claire. Students who enroll in the Community participate in a college orientation camp a week prior to the start of their freshman year, and are provided employment with Blugold Beginnings, enrolled in a common academic course, encouraged to participate in immersion experiences such as the Civil Rights Pilgrimage, and are paired with a faculty member who serves as a resource and advocate during their undergraduate career. Members of the BBMLC were matched to other multicultural students in a control group based on an array of factors including: gender, ethnicity, socioeconomic status, GPA, credit load, major, and college entrance exam score. It is expected that the BBMLC cohort will report significantly higher levels of campus involvement through collaborative research experiences, participation in student organizations, on-campus employment, attendance at various campus events, and use of campus resources than those not participating in the Learning Community. Additionally, members of the BBMLC are expected to report significantly higher levels of attachment to the University than students in the control group.

Abigail Lee Nygaard, Giney Claribel Rojas, Cindy Mai Yang and Kalia Yang (123)

Faculty Mentor/Collaborator: **Kristi L. Herbenson**

High School Blugold Beginnings Program: An Investigation of Program Impact

The Blugold Beginnings High School Program teaches underrepresented students (low-income, minority, first-generation) about post-secondary education and personal characteristics related to academic success. Mentors met with forty-five participants at North High School and Memorial High School weekly during study halls or classes. Mentors tutor and complete a grade-specific curriculum emphasizing academic skills (e.g., goal setting, organization skills, time management, etc.), college preparation (e.g., resume making, the importance of taking rigorous classes, applying for scholarships, etc.), and life skills for a successful future (e.g., budgeting money, exploring careers, planning ahead, etc.). Three surveys are administered to participants throughout the school year. The survey consists of two segments: 1) students' opinions regarding post-secondary education and their probability of pursuing a post-secondary program (7-point scale), and 2) students' understanding of post-secondary and career requirements (assessment). We expect to see a significant increase in participants' comfort with post-secondary education and a significant improvement in performance on the objective measure throughout the sequence. Additionally, the expected improvement in scores between last year and this year will show the program's development.

Lacey Faye Struensee, Elizabeth Ashley Harris, Phong Yue Lor and Tyler Reese Haro (114)

Faculty Mentor/Collaborator: **Lissa Jo Martinez**

Blugold Beginnings Fifth Grade Mentoring Program: An Investigation into the Effects of Precollege Programming

The Blugold Beginnings Fifth Grade Mentoring Program was developed at the University of Wisconsin-Eau Claire to teach low-income, minority, and first-generation students the steps necessary to enter a post-secondary program and the skills associated with academic success. This program supports students in fifth grade, offering mentoring and tutoring services. During weekly mentoring sessions, students completed a grade-specific curriculum that teaches seventeen different concepts including academic skills (e.g., study skills, organizational skills, goal setting, etc.), and information to encourage students to consider continuing into a post-secondary program after graduation (e.g., different avenues of higher education, exploring careers, etc.). Students from seven different elementary schools in the Greater Eau Claire Area participated. A control group was established and students were matched to mentors based upon factors such as socioeconomic status, ethnicity, gender, and first-generation status. Student growth was measured via pre- and post-assessments. Researchers expect the students in the program to show significant gains in their levels of understanding post-secondary education requirements and their self-reported feelings of comfort and confidence pertaining to higher education.

Alyssa Louise Yanzick, Sheina Aurora Wind, Grant Christian Butterfield and Kong Meng Her (113)

Faculty Mentor/Collaborator: **Shelly M. Voegeli**

Middle School Blugold Beginnings Program: An Assessment of Growth and Outcomes of Students Enrolled in the Program

The Blugold Beginnings Middle School Program was developed at the University of Wisconsin-Eau Claire to teach low-income, minority, and first-generation students necessary steps for entering a post-secondary program and also skills that are positively associated with academic success. This program supports students from sixth through eighth grade, offering them mentoring services. During the weekly mentoring sessions, participants complete a grade-specific, twenty-seven week curriculum, maximizing academic skills (e.g., organizational skills, scheduling, academic study skills, etc.), and building skills that will help prepare students for a post-secondary education (e.g., writing a personal statement, resume making and building, applying for financial aid, exploring careers, etc.). One hundred and thirteen students participated in the program from one of three middle schools in the Eau Claire School District: Delong, Northstar, and South. A control group was also established and students in the group were matched to those enrolled in the program based on factors such as socioeconomic status, ethnicity, gender, and first-generation status. Student growth was measured via a pre- and post-assessment, and researchers expect the students in the program to show significant gains in their levels of understanding post-secondary education requirements and their self-reported feelings of comfort and confidence.

ECONOMICS

Michael Joseph Dabat, Anthony James Navara, Samantha Jo Faber, Daniel Robert Hartson, John William Pepler and Justin Robert Prah (48)

Faculty Mentor/Collaborator: **Eric M. Jamelske**

The Great Recession and Subsequent Recovery: Comparing Participation in Temporary Assistance for Needy Families (TANF) and Supplemental Nutrition Assistance Programs (SNAP) Across Fifty States

The economic downturn of 2008-09 was so severe that it has become known as the *Great Recession* and by most accounts the subsequent recovery has been sluggish. Rather than characterizing the recession and subsequent recovery by labor market performance, one could instead look at the demands on social services for those in need of assistance. This poster uses data from the U.S. Department of Health and Human Services and the U.S. Department of Agriculture from 2007, 2009 and 2011 to describe the recession and recovery at a national level as well as compare the effects across states. Our findings show the U.S. saw a 27% increase in SNAP recipients between 2007 and 2009 with Nevada and Florida rising the most, 64% and 58% respectively. Looking at the demands on social services, the recovery has been non-existent with all fifty states having more SNAP recipients in 2011 compared to 2009. In fact, the number of SNAP recipients more than doubled in eight states between 2007 and 2011. TANF participation rates also show continuing hardship with 31 states experiencing a rise in recipients between 2009 and 2011.

Lainee Jean Hoffman, Judith Beth Dickinson, Stephen James Fisher, Stephanie Lynn Mabrey, Kevin Michael Reinhold, April Christine Ross and Laurelyn Elise Wieseman (23)

Faculty Mentor/Collaborators: **Eric M. Jamelske and Lori A. Bica**

The Impact of the USDA Fresh Fruit & Vegetable Program on Children's Consumption and Other Related Behaviors

Most children in the U.S. consume less than recommended amounts of fruit and vegetables. Experts and advocates recognize the school environment as a fundamental setting for providing children access to nutritious food and opportunities to learn about the importance of healthy eating. The United States Department of Agriculture (USDA) initiated its Fresh Fruit and Vegetable Program (FFVP) in 2002 as part of a broad effort to address poor nutrition and rising obesity rates among children. The research literature examining the effectiveness of the FFVP is small and developing. Given the sizeable resources committed to funding the FFVP, more information is needed to understand the successes, limitations, and potential in meeting its stated goals. In this study, we investigate the impact of the 2009-10 FFVP on intake and other behaviors related to fruit and vegetable consumption among Wisconsin 4th and 5th grade students. Consumption of fruit and vegetables served through the FFVP was recorded by teachers over 95 days. Analyses of other behaviors related to fruit and vegetable consumption compared pretest and posttest data from an eight item survey between program and control students. We find positive effects on both student intake and other behaviors related to eating fruit and vegetables.

Rebecca Leigh Hubbard and Carly Michelle Hanson (73)

Faculty Mentor/Collaborator: **Sanjukta Chaudhuri**

Female Mortality Disadvantage in India

Sons are considered more valuable than daughters in India, due to a strong patriarchal society. This preference often ensures sons a higher chance of survival than daughters. A girl may suffer from significant mortality disadvantages such as: pre-natal sex selection—a deficit of girls at birth—and post-natal discrimination—an excess female infant mortality. While female mortality disadvantage creates a large number of missing girls in India, prevalence of pre-natal sex selection and post-natal discrimination varies by state. The objective is to estimate the number, percentage, and source of female mortality disadvantage. Data from three National Family Health Surveys was used to estimate the number of missing girls in thirteen states. Mortality Rates of the southern state of Kerala was the standard for low discrimination. Across the surveys, northern and central regions accounted for the majority of total female deficit at birth, while the southern states showed little to no deficit. Punjab and Haryana (North) had the highest percentage of females missing at birth. Rajasthan (North), Uttar Pradesh (Central), and Madhya Pradesh (Central) had the highest percentages of excessive female deaths. This study draws attention to the regional variation in source and percentage of missing girls. Recommendations are discussed to improve policy effectiveness targeting this issue in each state.

Samuel Charles Levitus (93)

Faculty Mentor/Collaborator: **David L. Schaffer**

Occupational and Wage Inequality in the U.S. Labor Market

Over the last forty years, there has been a substantial increase in wage inequality in the U.S. labor market. While economists have investigated many possible causes, no single cause has been identified which fully explains these changes. Our research analyzed economic data from the U.S. Census Bureau's Current Population Survey for the period of 1971 through 2010. We paid particular attention to hourly wages, educational attainment, gender, race, and occupation. We calculated several different measurements of wage inequality, including generalized entropy index and the Gini coefficient. We also generated and compared many wage distribution graphs, paying close attention to the small differences that could not be captured by any of the broad indexes. We found that wage inequality has increased markedly in the past four decades, regardless of which metric or demographic group we analyzed.

John William Pepler, Daniel Robert Hartson, Michael Joseph Dabat, Samantha Jo Faber, Anthony James Navara and Justin Robert Prahl (49)

Faculty Mentor/Collaborator: **Eric M. Jamelske**

The Impact of the Great Recession on the Demand for Social Assistance Programs in the Eau Claire Area

The economic downturn of 2008-09 was so severe that it has become known as the *Great Recession* and by most accounts the subsequent recovery has been sluggish. National data show the demand for social assistance programs such as Temporary Assistance for Needy Families (TANF) and Supplemental Nutrition Assistance Program (SNAP) has grown between 2009 and 2011. This suggests that despite a somewhat slow recovery based on labor market measures (employment and unemployment rate), there seems to be a continuing increase in the need for social assistance. This poster presents data from a variety of local sources clearly illustrating this prolonged hardship and strain on social service programs in the Eau Claire area. These data sources include the Eau Claire County Department of Social Services, Western Dairyland, Feed My People Food Bank, Community Table of Eau Claire, Beacon House, Sojourner House, Salvation Army, and the Chippewa Valley Free Clinic. We are in the early stages of data collection for this project, but preliminary indications confirm an increased use of services provided through these organizations continuing through 2011.

Matthew Michael Porwoll, Chaid M. Przybelski, Jeremy Michael Schmitt, Benjamin Salisbury Streeter and Enkhjavkhlan Tsogtbaatar (46)

Faculty Mentor/Collaborator: **Eric M. Jamelske**

Testing a Market Hypothesis: The Counter-Cyclical Nature of Gold Prices

The Chippewa Valley Center for Economic Research and Development (CVCERD) collects and maintains a variety of stock market data. In particular, the CVCERD tracks the performance of an exchange-traded fund based on the price of gold (SPDR Gold Shares, GLD). In recent years, gold has generated a lot of investment attention as the price of gold has reached numerous record highs while increasing over 300% between 2003 and 2010. One theory that has gotten a lot of attention over this period is that gold is counter-cyclical to the overall stock market and is thus a good investment in a bear market. This poster examines the relationship between the Standard and Poor's 500 Stock Index and the price of gold between 1975

and 2011. We find that the price of gold is not as much counter-cyclical to the stock market as it is sensitive to the level of volatility in the overall market as measured by the Chicago Board of Trade's volatility index (VIX).

Justin Robert Prah, Samantha Jo Faber, Michael Joseph Dabat, Daniel Robert Hartson, Anthony James Navara and John William Pepler (47)

Faculty Mentor/Collaborator: **Eric M. Jamelske**

The Great Recession and Subsequent Recovery: Comparing Unemployment Rates and Total Employment Across Fifty States

The economic downturn of 2008-09 was so severe that it has become known as the Great Recession and by most accounts the subsequent recovery has been sluggish. One standard way of judging the severity of a recession and the success of a recovery is to look at labor market information. In particular, the unemployment rate and the total number of jobs are often used for this purpose. This poster uses data from the U.S. Bureau of Labor Statistics from 2007, 2009 and 2011 to describe the recession and recovery at a national level as well as compare the effects across states. In terms of employment, our findings show Nevada and Florida lost the most jobs between 2007 and 2009 sitting at 89% and 90% of 2007 levels, respectively. In contrast, North Dakota and Alaska actually gained jobs over this period. The data also confirm that the recovery has been slow with just seven states (North Dakota, Alaska, Texas, South Dakota, Louisiana, Wyoming and Nebraska) having at least the same number of jobs in 2011 as in 2007. The unemployment rate also shows a sluggish recovery with all fifty states having a higher unemployment rate in 2011 compared to 2007.

Daniel Scott Putman, Christopher Michael Brown, Drew R. Christensen, Elora Victoria Leene and Brittany Josepha Whited (70)

Faculty Mentor/Collaborator: **Eric M. Jamelske**

Comparing Survey Results to Assess Political Differences in Relation to Climate Change/Global Warming Awareness, Perceptions and Beliefs of College Students in the United States

Climate Change (CC), a phenomenon entailing warming average global temperatures (global warming, GW) is an important and divisive national and international policy issue. We conducted online surveys examining what 826 U.S. and 776 Chinese college students think about this important topic. Students were asked a variety of questions including if CC/GW was real and if it was caused by human actions. The U.S. subset of this data is particularly interesting when considering the relationship between political ideology and attitudes towards CC/GW. Within the U.S. sample there are significant differences in the political ideologies (ranging from conservative to liberal) as well as significant differences in the awareness, perceptions and beliefs of students regarding CC/GW. In this project we examine the relationship between the political ideologies of U.S. college students and their CC/GW attitudes. Through this, we are able to gain insights into the inability of the U.S. to come to a consensus regarding CC/GW, in particular due to the significant wedge between various segments of the political and CC/GW perceptual landscape. Further understanding of this wedge will elucidate current problems in developing both national and international CC/GW policies. Understanding these problems will help pave the way towards more effective policies.

Daniel Scott Putman (71)

Faculty Mentor/Collaborator: **Laura A. Middlesworth**

Double Trigger: Does It Explain Differences in State-Level Foreclosures Starts?

There are numerous factors contributing to the increase in mortgage foreclosure rates observed in recent years as well as the differences across states. Some states, namely Arizona, California and Nevada, experienced relatively large swings in house prices, leaving a disproportionate number of homeowners with negative equity and potentially facing foreclosure. As a result of the lax lending standards, many homeowners obtained mortgage loans with relatively high loan-to-value ratios, leaving them more likely to be in a position of negative equity as property values fell. Finally, the impact of the recession was felt nationwide but affected the states in different ways, especially in terms of job loss and unemployment rates; the loss of income and financial instability that accompanies unemployment left many homeowners unable to keep up with mortgage payments and facing the possibility of foreclosure. Empirical results suggest that falling house prices *alone* are not sufficient for explaining the rise in foreclosures in certain states; it is the *combination* of falling house prices and negative income shocks that are important for explaining differences in both subprime and prime mortgage foreclosure starts across states. These results contribute to the growing evidence supporting the "double-trigger" theory of mortgage default and foreclosure.

Daniel Scott Putman (72)

Faculty Mentor/Collaborator: **Laura A. Middlesworth**

What Matters More for Foreclosure Rates - Income or House Price Shocks? A Metropolitan-Level Study

The percentage of homes foreclosed in the United States doubled between 2007 and 2010. In some parts of the country, including cities such as Las Vegas and Fresno, the percentage of homes foreclosed is now more than twice this national average. Conversely, in cities such as Baltimore, the percentage of homes foreclosed is only one-third of the national average. Numerous factors, including differences in house price movements, might explain the large variation in foreclosures across metropolitan areas. As house prices fell during the collapse of the housing bubble, many homeowners found their mortgages “underwater,” or in a position of negative equity. However, changes in house prices alone cannot explain the variation in foreclosures; empirical evidence suggests that negative income shocks, when combined with changes in house prices and other market factors, explain more of the observed variation. We expect to find that metropolitan areas with unusually high unemployment rates *in combination with* falling house prices to experience relatively high foreclosure rates, which is consistent with the “double trigger” theory of mortgage default and foreclosure.

Kevin Michael Reinhold, Judith Beth Dickinson, Stephen James Fisher, Laine Jean Hoffman, Stephanie Lynn Mabrey, April Christine Ross and Laurelyn Elise Wieseman (24)

Faculty Mentor/Collaborators: **Eric M. Jamelske** and **Lori A. Bica**

Using Incentives to Influence Children to Bring Fruit and Vegetables from Home for School Snack

The United States Department of Agriculture (USDA) initiated its Fresh Fruit and Vegetable Program (FFVP) in 2002 as part of a broad effort to address poor nutrition and rising obesity rates among children. Previous research in Wisconsin found increased intake due to the FFVP, however even after six months of participating in the program, students did not bring fruit and vegetables from home to eat on days when one was not provided for free through the FFVP. This study investigates whether incentives can influence children to bring fruit and vegetables from home to eat on days when they were not served one for free. Baseline behavior was measured in phase one with no incentives. Phases two through six consisted of various combinations of incentives including toy prizes, reminders and positive role modeling. Teachers recorded the frequency with which students brought and ate fruit and vegetables from home over 53 non-FFVP days. Our results show this combination of incentives was effective as students brought just over 1,000 fruit and vegetable items from home over the period of study. Overall, teachers engaging their students and providing positive role modeling proved to be most effective in promoting meaningful change.

Benjamin Salisbury Streeter, Matthew Michael Porwoll, Chaid M. Przybelski, Jeremy Michael Schmitt and Enkhjavkhlan Tsogtbaatar (45)

Faculty Mentor/Collaborator: **Eric M. Jamelske**

The Eau Claire Basket Investment Track: A Four Year Comparison of the Performance of Local Stocks

The Chippewa Valley Center for Economic Research and Development (CVCERD) collects and maintains a variety of stock market and investment data. In particular, the CVCERD tracks the annual stock performance for a list of publicly-owned companies that are of local/regional interest through a simple investment basket called the Eau Claire Area Stock Basket (ECB). Each year, a hypothetical \$100,000 investment spread equally across ECB firms is followed through the course of the year. Although this investment does not actually reflect the state of the local economy, it is of interest in comparison to overall market trends. This poster presents an annual comparison of the performance of the ECB between 2008 and 2011. This time period is of interest because it spans the great recession and financial collapse through the subsequent economic recovery. In 2008, the ECB was down 38.8%, but experienced a recovery the next two years, rising 75.1% and 22.1 % in 2009 and 2010 respectively. The rise of the ECB has since ended with a drop of 7.0% in 2011.

Wendell Vooi Ley Tan (92)

Faculty Mentor/Collaborator: **Yan Li**

A Revisit of the Credit Rating: An Empirical Test of the First Passage Model

Credit ratings are assigned in the hope of overcoming the informative asymmetry between lenders and borrowers in financial markets. This project revisits the “first passage model” of credit ratings. We relaxed several assumptions within the model, thereby making it more tractable and easy to work with. The revised model’s validity was then tested by studying the creditworthiness of various nations, including the United States. Sovereign creditworthiness is important because it measures how well a nation repays its debts. Overall, the findings in our model are consistent with the actual credit ratings of those sovereign bonds as rated by credit rating agencies like Moody’s.

Brittany Josepha Whited, Christopher Michael Brown, Drew R. Christensen, Elora Victoria Leene and Daniel Scott Putman (69)

Faculty Mentor/Collaborator: **Eric M. Jamelske**

Comparing Survey Results to Assess Climate Change/Global Warming Awareness, Perceptions and Beliefs of College Students in the United States and China

Climate Change (CC), a phenomenon entailing warming average global temperatures (global warming, GW) is an important and divisive national and international policy issue. We conducted online surveys examining what 826 U.S. and 776 Chinese college students think about this important topic. Students were asked a variety of questions including if CC/GW was real and if it was caused by human actions. The U.S. and China are of interest because they are disproportionately responsible for world carbon emissions, however they are also different in several ways. U.S. emissions per capita are nearly four times China's, while Chinese emissions per \$ of Gross Domestic Product (GDP) are nearly twice that of the U.S. In addition, the U.S. ranks among the world leaders in per capita GDP, while China is a developing country with significant poverty, yet the Chinese economy has grown substantially over the last two decades. This project provides insight into the awareness, perceptions and beliefs of young adults in these two countries by comparing responses to a variety of questions. On average, Chinese students report a significantly greater awareness and understanding regarding CC/GW. These results are interesting and could have meaningful implications for future national and international CC/GW policies.

Laurelyn Elise Wieseman (68)

Faculty Mentor/Collaborators: **Rose-Marie Avin and Sanjukta Chaudhuri**

Modernization, Globalization, and Women in Argentina: Their Changing Roles in the Economy and Society

Argentina has experienced a remarkable transformation in its socioeconomic system, with many of the changes spearheaded by women. Its economy has become more diversified, industrialized, and globalized. Today, Argentina has one of the highest incomes per capita and socioeconomic indicators in Latin America. Yet, in spite of all the socioeconomic progress, the majority of women are struggling to advance their status. This project examines the impact of rapid growth and globalization on the socioeconomic status of women in Argentina. Professor Chaudhuri, Professor Avin and student Laurelyn Wieseman evaluated measures that are regarded as useful indicators of women's economic status: labor force participation rate, degree of occupational segregation, male-female earnings ratio, level of educational attainment, fertility rate, allocation of housework, and role in government. We conducted an extensive literature review and analyzed published government documents and various publications by non-governmental organizations (NGOs), and international organizations. Furthermore, we conducted an informal survey of 27 women in Mendoza, Argentina during the 2011 spring semester.

EDUCATION STUDIES

Chelcea Nicole Boesiger (119)

Faculty Mentor/Collaborator: **Jill Pinkney Pastrana**

Demanding Change: Student Mobilization and Neoliberal Education Policy in Chile

What are the motivating factors behind participation or non-participation in the student protests for education reform in July 2011? The significance of this research is related directly to neoliberal education reform which has been occurring in Chile along with the United States and how these reforms have motivated the students in Chile to collectively form a movement against this system of for-profit schooling. The methods used in this study were mixed methods with an emphasis on qualitative methods. Primarily, focus groups and informal and formal interviews were used to gather information from students and professors. Conclusions from this study have been formed based on six analytical categories which are history, education policy, family, sociopolitical perspectives, education democratic participation, and social affiliation. Among these, the primary categories emphasized by students were the history of Chile and the dictatorship of Pinochet, education policy and the ways in which the system currently favors and allows "for-profit" schools and results problematic, and the democratic participation of students in challenging the status quo in some regard was highly visible. All students stated or alluded to the need for change.

GEOGRAPHY / ANTHROPOLOGY

Elizabeth Evangeline Amann, Ellen Elizabeth Sorenson, Ross Aaron Auna and Brian Thomas King (65)

Faculty Mentor/Collaborator: **Joseph P. Hupy**

Cultural Geography and the Impacts of Generational Warfare in the Middle East

This research explores how warfare has changed in response to technological advancements over time. The emphasis is on cultural norms and practices that must be understood if the United States wishes to win any wars of the future, through the examination of case studies of the Second Lebanon War and Iraq War. The United States is considered to have the most technologically advanced military in the world, yet has struggled when facing adversaries with inferior technological capabilities. These lessons enforce the fact that superior technology alone is no longer winning wars. Assessing this power shift in warfare is necessary to facilitate the transition from well-defined wars of history to nonlinear wars of the future if the United States wants to prevail on these future battlefields. The academic discipline of military geography is well-versed in spatial analysis of historic battlefields. This research goes beyond simple spatial analysis to apply the theories of military writers to modern problems Western forces are facing against an enemy they have yet to decisively defeat in the past half-century. Cultural practices and norms are significant components of conflict that require consideration if technologically superior states wish to avoid defeat in future warfare.

Jon Ryan Bowen, Lindsay Gabrielle Jenson, Hillary Frances Johnson (42)

Faculty Mentor/Collaborator: **Paul J. Kaldjian**

Peoples of the Middle East and North Africa, 40 Years On

In 1972, National Geographic published “Peoples of the Middle East” as one of their insert maps. This popular relief map is replete with illustrations and details about the history, religions, languages, trades, and lifestyles of the Middle East’s inhabitants and highlights 22 ethno-linguistic groups from throughout the region. After four decades, however, much has changed in the Middle East and North Africa, and the representation of the people and places is outdated and, thus, misleading. This research draws from contemporary cartographic techniques to provide an updated and natter base map around which to display updated portrayals of the people and places of the Middle East and North Africa. Thus, the map explores representations of the Middle East and North Africa in an attempt to remediate common (mis)perceptions of the region. This research is a cooperative project of students in the Geography of the Middle East and North Africa class, Spring 2012.

Tyler John DeBruin (41)

Faculty Mentor/Collaborator: **Jeff R. DeGrave**

A Spatial Analysis of Social Issues in the USA by County

The United States has seen numerous cuts in spending with regards to social programs. With these cuts to social programs it is imperative to find the areas that are in greatest need for them. This project will be looking at 5 social issue variables to see if there are any patterns to their frequency. The variables that will be examined in this experiment will be DUI, Violent Crime, Property Crime, Foreclosure, and High School Dropout Rates at a county level. We believe that there will be clumping of counties where these issues are seen in higher concentrations. ArcMap will be used to archive and spatially map these variables. Each variable will then be combined into one master map where each variable will account for 20% of the result given for each county. Counties with high frequencies will have numbers closer to 1 and lower closer to 0. This project is still in progress, and will have more variables added in the future along with government spending numbers per county.

Benjamin P. Dunning (76)

Faculty Mentor/Collaborator: **Ryan D. Weichelt**

Spatial and Temporal Patterns in Wisconsin’s Presidential Elections from 1900-2008

The objective of this research is to find distinct time periods and like-voting regions within the state of Wisconsin’s Presidential elections from 1900-2008. Including both time and space within this project helps create a more solid picture of the patterns that occurred during this period. Voting results were collected for each county in each election during this time period from the *Wisconsin Blue Book*. Factor analysis was then used to determine specific time periods and electoral regions throughout Wisconsin. T-Mode analysis calculated time periods and S-Mode analysis found the electoral regions in Wisconsin. In addition to these quantitative results, many other sources were used to demonstrate electoral patterns through time and space in Wisconsin. The majority of qualitative sources that support these findings come from political geography, history and political science sources. The period of 1936-1960 will be emphasized in this presentation because of the

important shift that occurred during this timeframe. The results of this study add to the existing literature of how history and geography can be used to understand politics in the Badger State.

Hillary Frances Johnson (50)

Faculty Mentor/Collaborator: **Paul J. Kaldjian**

Eau Claire, Wisconsin's Local Food System as Alternative Food Network

This research project explores the local food possibilities and the constraints to local food participation experienced by citizens in Eau Claire, WI. There is a need in current local food literature for theoretically-grounded, empirical studies of place-specific practice. Eau Claire's local food system is examined as an Alternative Food Network (AFN) in which environmental, economic, social, and nutritional wellbeing are goals. Morgan, Marsden, and Murdoch's (2006) idea of the Actor Network Theory (ANT) provides the theoretical context that says food networks are composites of various actors which make up the network. By examining local food practices and opportunities in Eau Claire, WI this paper questions who is included in the Alternative Food Network, what "local" means within the network, and the actions people are taking to participate in the network. It is becoming clear that knowledge about and access to good food may still not be sufficient for people to move toward good and healthy local food choices (Bobrow-Strain 2012). By applying ANT toward Eau Claire, WI's Alternative Food Network we aim to better understand the obstacles and opportunities in local food systems. This research draws from a fall 2010 survey of East Side Hill households in Eau Claire, combined with interviews, local accounts, and a variety of spatial data.

Meghan Anne Kelly and Jon Ryan Bowen (75)

Faculty Mentor/Collaborators: **Christina M. Hupy** and **Ryan D. Weichert**

The Geography of Super Tuesday in Ohio through Twitter

By the end of 2010 Twitter claimed 175 million users and in a year grew by 1382 percent. Social media has changed the way we communicate by fostering interactive dialog whether it is on personal, business, political, news, or pop-culture topics. Many analysts are eager to use social media to gain a better understanding of various markets, for example, Facebook's usage of targeted advertisement. Another such market is voters. This research explored the relationship between social media data and election outcomes. More, specifically, this research examined the statistical relationship between Twitter posts and the Super Tuesday results for the GOP in 2012. Twitter users are offered a "GeoTag" setting that allows individual Tweets to be searched based on location. The GOP primary results and the corresponding count of "GeoTagged" Twitter posts from March 4-6 for each candidate were collected for 89 counties in Ohio. Regression analysis explored the relationship between the independent variables, Twitter post counts, various demographic variables from the US census (population, income, race, and education), and the dependent variable, primary results by candidate. This project explores the importance of Twitter data as a tool for politicians, media, and political geographers alike, as a new way to track the popularity of candidates.

Brandon Lee Schleicher (52)

Faculty Mentor/Collaborator: **Joseph P. Hupy**

Vietnam in 3D: Using Geospatial Technology to Better Understand Military History

Many Vietnam conflict historians have struggled with describing the tortuous relief of the Viet Nam landscape. Traditional hard copy maps, lacking a three-dimensional perspective, along with mere textual descriptions, are often inadequate in describing how terrain was one of many difficulties soldiers faced during the Viet Nam conflict. Advancements in computer mapping technology have provided a valuable set of tools for visualizing historic information. This computer-based mapping technology, along with many new forms of high resolution data, promises to provide audiences interested in Viet Nam history with an accurate depiction of the landscape. This study focuses on the Khe Sanh battlefield, and how the relief and its hilltops were key factors in the battles that occurred there in 1967 and 1968. The sand table President Johnson had constructed to monitor the events of the siege that occurred there in 1968, when compared to these modern depictions of the terrain, did little justice towards relating how the enemy harnessed the formidable terrain to their advantage. This case study illustrates one of the many ways advancements in geospatial technologies can improve how we view historical events such as the battles at Khe Sanh.

Ellen Elizabeth Sorenson (66)Faculty Mentor/Collaborator: **Ezra J. Zeitler***Social Spaces of Gentrification in Northeast Portland, Oregon*

Gentrification, a process that involves the replacement of a less affluent group by a wealthier social group in inner city neighborhoods, occurs in cities throughout the world. In America, gentrification typically involves White intrusion into predominantly African American communities. The historically Black neighborhoods of northeast Portland, Oregon are representative of this trend. Our research utilizes cultural landscape and geospatial analysis to examine three categories of social spaces that represent different phases of the gentrification process. The first of these spaces are recently designated bike lanes that aid gentrification by aligning with the city's longstanding 20-minute neighborhood design and attracting a growing segment of young professionals. The second category involves specific business types and public spaces, such as coffee shops and dog parks, which have opened to accommodate the desires of these new residents and their creature comfort lifestyles. The third type of space are arenas for public dialogue, like monthly community forums, that facilitate greater cultural understanding among new and old residents and results in what has been described as "antiracist place-making." Analyzing these spaces reveals many ways that the controversial process of gentrification can impact the appearance and atmosphere of neighborhoods affected by it.

Corrin Francis Turkowitch (67)Faculty Mentor/Collaborator: **Ezra J. Zeitler***Milwaukee's North Avenue: A Racialized Landscape*

Understanding the reflection of race in the landscape at multiple scales is central to the field of geography. Milwaukee is nationally recognized for exhibiting high degrees of segregation. My research focuses on analyzing the segregation that plagues the city through a representative street-level example. North Avenue is a street that transects the city, running through both predominantly black and predominantly white neighborhoods. Utilizing a mixed-method approach, I will examine how race, class, and gender are manifested on the North Avenue landscape at many scales. My methodology focuses on landscape analysis including observation of business location and type, as well as human interaction with public space. In addition, geospatial analysis is used to compare demographic characteristics among neighborhoods along the street. By examining both the commercial and demographic characteristics through the lens of the North Avenue transect, the study reveals the nature of Milwaukee's racialized landscape.

Noah Jonah Wiedenfeld (51)Faculty Mentor/Collaborator: **Paul J. Kaldjian***Food Insecurity in Northwest Wisconsin: Lessons from Eau Claire*

Food insecurity in northwest Wisconsin is growing rapidly. This insecurity is linked to the area's largely rural demography and its distance from Madison. To help understand this, the food system in and around Eau Claire, Wisconsin, is analyzed. The goal is to understand food security, its spatial patterns, how it works, and who is affected. Field interviews, phone conversations, email, and work group meetings with local government and nonprofit experts are combined with government data and reports to understand the nature and extent of food insecurity in Eau Claire and northwest Wisconsin. As part of the effort to understand the food systems of the food insecure, we use FoodShare (food stamp) data to identify consumption patterns and how purchasing decisions may be linked to hunger. The combination of statistical data with case studies, first-hand accounts, and local perspectives, help us understand the obstacles to purchasing and obtaining healthy food, the distribution and characteristics of food insecure households, and the systems in which they participate. This work is part of the effort to inform policy makers and address the nutritional needs of northwest Wisconsin.

HISTORY**Tarek Hakeem Shagosh (118)**Faculty Mentor/Collaborator: **Patricia R. Turner***Evaluating the Success of the Arab Spring Popular Uprisings*

The goal of this project is to determine the legitimacy of the proclaimed "revolutions" that took place in the Middle East as part of the Arab Spring protest movements that began in 2011. Utilizing the theories of comparative revolution proposed by the prominent sociologists Charles Tilly and James Davies, this project analyzes the political outcomes of the upheavals in Libya, Syria, and Egypt to determine whether they were in fact revolutions or less transformative domestic revolts and coups. It argues that the historical events preceding and during these upheavals indicates that only Libya qualifies as a

“grand revolution.” This research suggests, moreover, that the more limited nature of the movements in Egypt and Syria may be why both have failed up to now to result in transformative reform.

INFORMATION SYSTEMS

Samantha Jane Gleason and Wai Ling Ho (100)

Faculty Mentor/Collaborator: **Bruce W. N. Lo**

China's Information and Communication Technology (ICT) has made great progress in the last decade. China now has the largest Internet user base in the world. This study compares how U.S. and Chinese subjects execute ethical reasoning in technological situations and how traditional values have impacted ethical decision-making. A research team traveled to: Hong Kong, Guangzhou, Wuhan, and Changshu to administer an IT ethics survey. The survey measures: age, gender, ethnicity, work experience, and major area of academic study. It presents two different ethical scenarios in which to measure the decisions of the subjects, the ethical principles on which their decision is based, and the subjects' stage of moral development as defined by Kohlberg. Responses were analyzed with respect to the demographic variables and cultural groups. Significant differences were observed in the cases of years of schooling, area of specialization, the nature of work experience, and Kohlberg's stages of moral development. The Chinese sample tended to operate towards the post-conventional end of the continuum while the U.S. sample tended to operate towards the pre-conventional levels of individualism. The implication of these findings in assessing how the two cultures interact with each other in business transactions and technological context will be discussed.

Jacob Clarke Koerner, Matthew J. Sias and Heidi Ann Bartling (86)

Faculty Mentor/Collaborator: **Thomas S. Hilton**

Regulating the Internet: Alternatives & Effects

As the general population grows in technological skill, the Internet continues to be the single biggest source of information available to the general public. With this growth, there is an increase in the amount of controversy surrounding regulations and how they should be structured to keep the internet safe and secure. This research will evaluate different alternatives and their effects as viewed by the student body. To obtain this information we will survey the student body on their internet usage and on their opinions about different scenarios and viewpoints. We will obtain a scale of responses from the individual student as well as the student body as a whole. Once we have obtained the students' overall feeling we will be able to determine the degree to which they feel the Internet needs to be regulated and how they wish to accomplish this regulation. We expect to see support for varying degrees of regulation based on current internet usage habits.

Thang Minh Nguyen (99)

Faculty Mentor/Collaborator: **Bruce W. N. Lo**

Regional Difference in Ethics Decision Making: A Study of IT Pre-professionals in China

Information and communications technology (IT) played a significant role in the economic growth of China, the second largest economy in the world. As a result, China faces many societal and ethical challenges common to technology-based countries. Ethics reasoning and ethical practices are often related to cultural expectations and regional norms. The purpose of this study is to investigate difference in IT ethics decision making in different regions of China. An IT ethics decision survey was developed and administered in four regions in China with different degrees of westernization. Three theoretical concepts associated with ethics reasoning were explored: (a) Ethical principle upon which people make ethics decisions. Examples from classical ethics theory include virtue, common good, utilitarian, fairness, and fundamental rights principles. (b) Scope of the decision-maker's consideration and (c) Kohlberg stages of moral development in ethics reasoning. The data were analyzed using standard cross tabulation Chi-square test techniques. Preliminary results reveal observable differences among subjects from the four regions with respect to their decision choices, reasons for the choices, the scope of consideration, and the stage of their moral development. The subject group exposed to the strongest western influence, showed the highest degree of individualism in making ethics decisions.

Andrew George Salwey (89)Faculty Mentor/Collaborator: **Bruce W. N. Lo***An Analysis of Information Systems Ethics*

The purpose of this research project is to provide an analysis and commentary on information systems (IS) Ethics. More specifically, it compares the “Codes of Ethics” published by several prominent information technology (IT) organizations to extract the underlying principles. A brief experimental study was then conducted to explore people’s reaction to a set of scenarios that reflect those principles. As the applications of IT permeate every aspect of human endeavors, Information System Ethics deserves the attention of every student preparing to enter into the professional world of our information-based society. Our research shows that the academic path that a person chooses has a great bearing on how that person perceives certain IS ethical situations. If a person has work experience in IT, that person is more likely to solve related ethical dilemmas in the more holistic manner. Furthermore, even without IT work experience, the major that a person takes determines how he or she will approach an ethical dilemma.

Tsun Kwan Siu (98)Faculty Mentor/Collaborator: **Bruce W. N. Lo***Technology Impact on IT Ethics Decision Making in China*

As an emerging technological economy and one with the largest number of Internet users, China faces many Information Technology (IT) ethics challenges common to other countries in the developed world. This research investigates the impact of technology exposure on IT professional ethics which focuses on ethics decision reasoning and decision patterns among IT and business pre-professionals in China. An IT ethics survey was administered to 950 subjects in 4 Chinese cities. Their decision patterns in IT ethics context were analyzed to examine the impact of technology adoption and exposure. Preliminary results indicate some interesting differences between the technological advanced subjects and the less technological advanced subjects. However, the difference is not as simplistic as originally thought. Two independent variables were used to measure the degree of technology exposure: namely the subjects’ major area of specialization, and nature of their IT work experience. No significant differences were observed between the two groups with respect to the ethicality of both scenarios. A stronger significant difference was observed with respect to the nature of work experience, i.e. those with IT work experience differ significantly from those without. The implications of these findings for the formulation of IT ethics guidelines will be discussed.

Laura Anne Spelbrink and Michael Stephen Abbott (88)Faculty Mentor/Collaborator: **Bruce W. N. Lo***IT Ethics in China and the United States*

Recent advances in computer technology have raised public awareness on ethical issues in Information Technology (IT). Ethical reasoning is shaped by cultural expectations and social norms. China has emerged as the country with the largest number of internet users. This study investigates the differences in IT ethics decision-making in an emerging country and a developed one. Data was collected from United States and China in survey form. This “IT ethics decision” survey was administered to 750 subjects from four cities across China. It was also administered to 300 subjects from the American Midwest. Demographic variables include gender, age, ethnicity, work experience, and major. We proposed two ethical situations in which the subjects must state what they would do and the reasoning behind that decision. Dependent variables measured relate to the action choice, the principle on which the decision was based, and the scope of consideration. The data were analyzed using standard statistical techniques including cross tabulation, Chi square, and nonparametric tests. Results indicate differences between the decision choices and the scope of consideration with respect to demographic variables: education level, nature of work experience, and major area. The implication of these findings in IT ethics training will be discussed.

LIBRARY

Angela Marie Stangl (94)

Faculty Mentor/Collaborator: **John H. Pollitz**

Information Literacy: An Expanded Paradigm

This multiple-phase project explores the current trends in collaboration between academic libraries and university student services, gauging the efficacy of current cooperative efforts, and evaluating whether “information literacy” expands among students. The project’s goal is to discover the nature of collaborations between libraries and student service units with respect to information literacy. The project includes a survey of Midwestern academic library administrators regarding cooperative ventures with student service units in order to determine what types of collaborations exist and their effectiveness in reaching a student population. Interviews with librarians about such collaborations will define how academic libraries reach out to students. Collaborations with student services may offer yet another avenue to teach students about how to effectively use information. This presentation will teach attendees the definition of information literacy from a library perspective, the nature of collaboration, how student service units are well-suited to be library partners, the extent of existing library collaborations outside of academic departments, and the overall effectiveness of library collaborations with student service units in reaching student populations.

MANAGEMENT AND MARKETING

Carly Nicole Zubell and Shanon Marie Palmbach (87)

Faculty Mentor/Collaborators: **Charles L. Tomkovick** and **Jeff S. Erger**

Using Social Media to Help Students Obtain Success Scripts for Job, Career, and Life Achievement

Using social media and qualitative software techniques, this research proposes to identify key job, career, and life success scripts from UW-Eau Claire Marketing alumni. The data has been gathered through a series of surveys sent out to Dr. Tomkovick’s Facebook and LinkedIn network. Additionally, a Qualtrics survey was sent to specific members of Facebook and LinkedIn added to the network after the initial survey was sent out. Once the data is fully analyzed, and patterns identified, this important information will be disseminated throughout our marketing curriculum, through communiques to current and future students here, and through a scholarly academic marketing proceedings and the journal manuscript process. From this analysis we expect to find common themes as identified in our hypotheses that can enhance the marketing curriculum and enable the university to tailor their classes around the advice provided by the alumni. The ultimate outcomes we hope to achieve are: giving key insights to current marketing undergraduates about the job market, job industry and what to expect after graduation. This study will benefit UWEC students, because the sources will be highly credible and the scripts will be relevant for these challenging economic times we live in.

POLITICAL SCIENCE

Derek John Waterstreet (116)

Faculty Mentor/Collaborator: **Justin W. Patchin**

External Collaborator: **Sameer Hinduja, Florida Atlantic University**

Cyberbullying and the Effect on School Climate

According to research, 93% of students aged 12 and up regularly use the Internet. The growing use of technology and the Internet can have very beneficial purposes in the school setting. However, technology can also be used by teens as a weapon against their fellow classmates. Cyberbullying, defined as the willful and repeated harm through the use of computers, cellphones, and other electronic devices, has increasingly caused problems with a school’s quality and character, otherwise known as the school’s climate. This current research project examined the relationship between a school’s climate and the presence of cyberbullying within a school. Data were gathered from a review of the current literature, research, and programming all of which are trying to combat cyberbullying and its effect on a school’s climate. A study analyzing this relationship revealed that a higher percentage of students who have been victims and/or cyberbullies themselves are associated with a lower school climate. Schools that have programs instituted to combat cyberbullying tend to display a higher climate and produce students who are safe and responsible while using technology. Students and schools need to recognize the problem of cyberbullying and its negative impact on the climate of a school.

PSYCHOLOGY

Jenna Lynn Carlson (173)

Faculty Mentor/Collaborator: **Jeffrey A. Goodman**

Do I Care if I Get Credit for my Ideas? Status Hierarchy and Indirect Influence

In small-group settings, lower-status individuals are typically ignored, while higher-status individuals are attended to. As a result, the contributions of higher-status individuals have a direct impact on group decision making. Conversely, the contributions of lower-status individuals have little direct impact on decision making. When lower-status members do influence the group, they tend to have indirect influence that is not credited to them (Goodman, Alexander, Chizhik, Chizhik, & Eidelman, 2010). The purpose of the present project is to determine how it feels to have your idea reflected in a group's final decision in the absence of receiving credit for your idea. We intend to report on the results of a study in which under-classmen (lower-status) or upper-classmen (higher-status) participants imagine working with same or opposite-status students on a graded group assignment in which their contribution was used and credited to them (direct influence) or used and not credited to them (indirect influence). We hypothesize that having indirect influence will only be perceived as acceptable when one's group mates are of a higher status than oneself. If supported, our results will contribute to the psychological understanding of social influence in small groups and will provide insight into the experiences of lower-status individuals.

Alex DeLaPena, Lindsey Ann Havertape and Katherine Emily Quigley (139)

Faculty Mentor/Collaborator: **Jennifer J. Muehlenkamp**

Prevalence of Non-Suicidal Self-Injury and Help-Seeking on College Campuses

Non-suicidal self-injury (NSSI) has become a serious problem on college campuses across the country. The purpose of this study was to determine factors predicting help-seeking for NSSI as well as factors predicting the stopping of NSSI after treatment. Archival data which included data collected from a stratified random sample of students from eight universities nationwide was used for the current study. Participants included 14,235 (53% female) college students, of which 15% reported having self-injured at one point in their life. Less than 40% of those who self-injured sought therapy, and only 46.1% of those who sought therapy stopped their NSSI afterwards. Logistic regression analyses were used to test study hypotheses. It was found that being female, engaging in more frequent NSSI, greater psychopathology, having more positive attitudes towards help-seeking, and having a parent/adult who knows about the NSSI increases the likelihood of seeking treatment for NSSI. It also was found that students who have less frequent NSSI and who see one therapist for a longer time period are more likely to stop NSSI. These findings bring awareness to the prevalence of NSSI on college campuses, and can be utilized by universities to help promote seeking treatment and to increase the likelihood that therapy is successful.

Alex DeLaPena, Kim Nicole Miresse, Emily Ann Mertens and Cristina Marie Soto (138)

Faculty Mentor/Collaborator: **Jennifer J. Muehlenkamp**

UW-Eau Claire Student Counseling Use and Preference

UW-Eau Claire (UWEC) Counseling Services is concerned about the lack of awareness and usage of some of their services. The purpose of this study was to collect data from UWEC students that Counseling Services could use to inform decision making about the types of services to provide to students. All UWEC students were sent an email inviting them to voluntarily complete an anonymous on-line (Qualtrics) questionnaire. The survey inquired about students' awareness of UWEC's counseling center, the services most desired by students, students' concerns regarding the use of counseling services, the times and locations most convenient for receiving services, and basic demographic information. There were 1,864 responses (73% female) to the survey. Data analysis is currently being performed and preliminary results show that a large portion of students (63%) lack basic knowledge about Counseling Services. Additional analyses will provide information about the barriers preventing students from utilizing the services, the types of services most preferred by students as well as gender differences in preferences. These findings will inform future changes to service delivery by UWEC Counseling Services to best meet the needs of UWEC students.

Christina Marie DeLapp and Trevor Goldsmith (246)

Faculty Mentor/Collaborator: **Kevin P. Klatt**

The Effects of Differential and Lag Schedules of Reinforcement on Increasing Verbal Responses for a Child Diagnosed with Autism: A Pilot Study

Often children with autism lack variance in responding to questions. In order to address this problem, lag schedules of reinforcement have been shown to increase response variability in children with autism. On a lag schedule, a response is reinforced if it differs from a specific number of previous responses. The purpose of the current study was to examine the effects of differential reinforcement (DR) (i.e., all appropriate responses are reinforced) and lag schedules of reinforcement to increase the variability of responses to social questions (e.g., "What do you see in the living room?"). The present study used a non-concurrent multiple baseline across skills design. Results indicate that lag schedules of reinforcement increase variance in responses.

Jennifer Erin Dobbe, Joseph Paul Vargo, Amy Renee Johnson, Emily Jo Hoida, Ryan Michael Van Asten, Bryan Andrew Donovan, Krystal Ann Reed, Courtney Lauren Mari Nelson and Bailey Gomer (103)

Faculty Mentor/Collaborator: **David C. Jewett**

Effects of Chlorpromazine in Rats Trained to Discriminate Between 2 and 22 Hour Food Deprivation

Obesity is a leading cause of premature illness and death in the United States. We have developed and refined a food deprivation discrimination task to investigate neurochemical and dietary factors that influence the discriminative stimuli associated with acute food deprivation. Chlorpromazine, a dopamine antagonist has been shown to decrease food intake in several species. We examined the ability of chlorpromazine to reduce the effects of acute food deprivation in rats trained to discriminate between 2 and 22 hrs food deprivation in a two-lever choice procedure. Generalization testing began after the discrimination was acquired (~90 daily sessions). During generalization tests, subjects were food deprived for 22 hours. Thirty minutes before the tests, subjects were administered saline or chlorpromazine (0.32 - 3.2 mg/kg, i.p). Chlorpromazine did not affect the discriminative stimulus effects of 22 hour food deprivation, although chlorpromazine did decrease response rates following 1.0 and 3.2 mg/kg. Chlorpromazine (3.2 mg/kg) decreased food intake measured for 1 hr after the generalization test. These findings suggest chlorpromazine alters food consumption by mechanisms other than those related to internal states associated with acute food deprivation.

Jennifer Marie Fisher (126)

Faculty Mentor/Collaborator: **Blaine F. Peden**

Male Feminist Theory: Role Association and Feminist Concept Dominance

Although there is much research about females' conceptions of "feminism," there is little research about males' conception of "feminism." This study intends to show the link between the way male college students perceive themselves in a feminist perspective and whether or not they actually show feminist ideals. I believe the results will show many male college students are more feminist than they believe themselves to be. After filling out an adapted questionnaire from Bargad & Hyde (1991), participants will either be informed or not of their feminist standpoint. Then all participants will read a prompt of a feminist situation followed by parts of the questionnaire again. The results of this study will hopefully show when being told you are a societal role, such as feminist, how it can change the way you perceive yourself in that role and in turn how you react and handle a situation. These results will help extend into the new wave of feminism and will also integrate the idea of self-proclaimed roles having an effect on societal factors.

Bethany Raye Franklin, Amy Elizabeth Johnson and Jenna Anne Kelley (232)

Faculty Mentor/Collaborator: **April L. Bleske-Rechek**

Birth Order and Personality: Testing Assumptions with Independent Siblings' Reports

Assumptions about the effects of birth order on personality abound in popular culture, self-help books, and the scholarly literature. In one popular book, *Born to Rebel*, Frank Sulloway (1996) proposed that firstborn children have much to gain from following the status quo and hence should be conscientious and rule-bound; laterborn children, in their unconscious inclination to obtain others' investment by distinguishing themselves, are more likely to be agreeable and unconventional. In within-family comparisons in which one adult reports on his/her personality and compares it directly with that of his/her siblings, firstborns do tend to be judged as the "achievers" and laterborns as the "rebels." However, researchers have failed to obtain independent self-reports of personality from two sibling adults in the same family. Following the logic of Harris (2006), we hypothesized that siblings' independent self-reports would not differ by birth order. To test this hypothesis, we collected Big Five and Big Three personality data on 92 college students (along with peer reports on most of them for

a convergent assessment of personality); for 80 of the students, a sibling also provided self-report personality data. We investigate whether firstborn siblings' self-reported personality traits differ systematically from laterborn siblings' self-reported personality traits.

Kaetlyn Leah Graham and Michael Peter Schiel (150)

Faculty Mentor/Collaborators: **Blaine F. Peden** and **Allen H. Keniston**

An Investigation of the Stroop Task Effect Using an Orthographic Variation of the English Language

This study involves a variation of the Stroop Color-Word Task using leetspeak, a form of communication substituting symbols and numbers for the letters of the English Alphabet, which emerged among online gaming communities. We will investigate the interference produced by the Stroop task when using an orthographic variation of the English language. We will also investigate the cognitive processes occurring when participants are exposed to multiple differentiating tasks—reading the leet word vs. identifying word color. Participants will be exposed to a series of slides; including leet words presented in congruent and incongruent word-color combinations. Participants will be asked to identify the color of the word, as opposed to reading the word in the baseline slides. Learning effects and subject variables such as familiarity with leetspeak and ACT scores will also be investigated. We predict: (1) The interference effect for reading incongruent color words will be greater for those participants most familiar with leet words. (2) A perceptual learning process will occur between the baseline of reading leet words. (3) ACT scores will demonstrate a negative relationship with the time it takes to read the leet words and identify colors.

Lindsey Ann Havertape, Kim Nicole Miresse, Ashley Marie Stewart, Alejandro J. Delapena, Katie Marie Immerfall and Michael Joseph Kosiak (146)

Faculty Mentor/Collaborators: **Jennifer J. Muehlenkamp** and **Roberta A. Goodman**

Long-term Impact of a Campus Suicide Prevention Program

This research aims to assess the impact of a peer-delivered Suicide Prevention Program at UWEC. Given that suicide is the third leading cause of death among the college-aged population, prevention efforts that encourage students to intervene with suicidal students is necessary. Prevention program presentations were offered by trained undergraduate students to select undergraduate classes and scheduled drop-in seminars. For each program, a pre-post method was conducted to assess immediate changes in knowledge, suicide stigmas, self-efficacy, and referral behaviors. A follow-up assessment administered approximately one month following the original presentation date aims to evaluate the long-term impact. To date approximately 310 students participated in the pre-post assessments and approximately 111 students completed the follow-up assessment. Data continues to be collected and will be presented, along with the follow-up assessment results. Effects of the program will be evaluated using multivariate statistics. From that we expect the results to support the long-term effectiveness of this program.

Katie Marie Immerfall, Drew Randall Ivan Nelson and Nathaniel Berninghau Murken (135)

Faculty Mentor/Collaborator: **Allen H. Keniston**

External Collaborator: **Kathryn Hamilton, UW-Stout**

Type of Test Order Effects in a Study of PowerPoint's Impact on Comprehension and Transfer of Lecture Information

In an investigation of the capacity of PowerPoint to enhance students' understanding of and memory for a lecture, we discovered that administering a retention test first seemed to enhance performance on a transfer test compared to the reverse test order. Conversely, administering a transfer test first depressed retention test scores. Randomly assigned to one of the two test orders, students completed the tests immediately after viewing a lecture on neuron communication. Half of the participants heard the lecture accompanied by text-based PowerPoint slides and half did not. Surprisingly, the PowerPoint slides did not influence either test result, but test order did. Apparently, remembering what they had learned enabled students to apply their understanding of the lecture to situations not discussed in the lecture. However, we think that having to apply understanding of the material first interferes with remembering it. Our result has practical implications for valid assessment of teaching goals at lower versus higher cognitive levels, and theoretical implications for relationships between memory and comprehension.

Katie Marie Immerfall (136)Faculty Mentor/Collaborator: **Blaine F. Peden***Gender Norms Influence Perceptions of Sexual Assault: Consequences for Mental Health*

This experiment examines the role that gender norms play on perceptions of sexual assault and how these perceptions influence the later development of psychological trauma and mental disorders. Past research explored whether men that believed in traditional gender norms were more likely to believe in “Rape Myths” and have had nonconsensual sex. This study aims to extend past research to examine whether women who hold traditional gender norms are also more likely to develop mental health problems. Adult men and women will answer questions via an online survey about their own sexual history, including consensual and nonconsensual experiences. Each participant will also answer questions regarding their perceptions of sexual assault and views of gender norms. The hypothesis predicts that participants with traditional gender norms will be more likely to have engaged in or experienced sexual assault, and victims will have experienced more psychological trauma as a result. If the results of this study reveal that women with traditional gender norms are more likely to have experienced psychological trauma after sexual assault, then in the future other women may benefit from preventative training on the definitions of sexual assault and learning about “Rape Myths.”

Paige Marie Jablonski, Kellyn Ann Kroner, Jacob Lawrence Bradley, Danielle Marie Barber, Beatrice Rae Soderholm, Amy Renee Johnson, Emily Anne Vanlandschoot and Eric Michael Hanley (160)Faculty Mentor/Collaborator: **David S. Leland***Incentive Value and Brain Electrophysiology in a Target/Nontarget Discrimination Task*

The P3 is a peak, in the scalp-recorded electroencephalogram (EEG), which appears 300-500 ms after a rare, highly task-relevant, and/or motivationally salient stimulus. It is associated with attention to and evaluation of important information. Prior research investigating the influence of motivation on the P3 has focused primarily on cued-target detection tasks or decision-making tasks in which P3 is evoked by reward feedback. We had participants respond to targets and withhold response to nontargets to earn points under high and low (5 point versus 2 point) conditions, with total points earned affecting individuals’ odds of winning a gift-card. These stimuli were neither preceded by cues nor followed by feedback. P3 strength did not vary by point value. However, because targets and nontargets in this design differed only by response requirements, being matched for visual characteristics, frequency (50% each), task-relevance, and incentive value, we were able to compare the influence of response requirements alone on P3 and other EEG components. For example, even nontargets evoked P3s, although they were smaller and differently distributed over the scalp than target P3s. We discuss these comparisons and the potential role of incentive value on the P3 and related mental processing.

Paige Marie Jablonski (159)Faculty Mentor/Collaborator: **Catya von Karolyi***Visual Spatial Tasks Predict Visual Spatial Talent and Mathematical Giftedness*

A review of the literature reveals that certain visual spatial tasks correlate with specific gifts and talents. Two tasks, the Impossible Figures Task (IFT) and Mental Rotation (MR) stand out as predictive of visual-spatial talent and mathematical giftedness, respectively. During the IFT, observers are presented with line drawings of objects that are either possible (could exist in 3D space) or impossible (could not exist in 3D space) (von Karolyi & Winner, 2004). The IFT measures global or holistic visual spatial awareness (versus local awareness) and is associated with talent in the fine arts (Chan, 2010). During MR tasks, observers are presented with drawings of 2D or 3D objects and are challenged to select an option that correctly represents the object from another angle. The MR task measures visualization ability and is associated with mathematical giftedness (Gallagher, 1992). Both tasks predict heightened abilities. In general, tasks calling upon 3D visualization are known to be more difficult than are those calling on 2D visualization (Hoyek, Collet, Fargier, & Guillot, 2012). Based on our review, we conclude that future research should empirically test whether 3D visualization tasks are generally more predictive of gifts and talents than are those requiring only 2D visualization.

Amy Elizabeth Johnson, Bethany Raye Franklin and Jenna Anne Kelley (231)Faculty Mentor/Collaborator: **April L. Bleske-Rechek***Does Rearing Environment Shape Romantic Attachment Style? Using Siblings to Test for Shared Environmental Influences*

Romantic attachment style refers to the degree to which individuals are comfortable with closeness and feel that others are available to meet their needs. Although research has linked romantic attachment with relationship satisfaction and outcomes, little is known about how people develop their romantic attachment style. We conducted two studies to test

the hypothesis that the home environment shapes individuals' feelings about closeness and interdependence in romantic relationships. If the home environment shapes attachment style, then siblings who are raised in the same home should be similar in attachment style. Study 1 included romantic attachment data from 52 sibling pairs; Study 2 included romantic attachment data and personality profiles from 80 sibling pairs. Study 1 revealed no systematic similarity between siblings' attachment styles. We are preparing to analyze Study 2 data. We will explore sibling similarity in attachment style, links between personality traits and attachment styles, and the possibility that similarity in attachment style can be accounted for by sibling similarity in personality. Given that a lack of sibling similarity in attachment style also implicates a lack of genetic influence on individual differences in attachment, we propose that nonshared environmental influences are primary in the development of romantic attachment.

Amy Renee Johnson, Christina Marie DeLapp, Jennifer Erin Dobbe, Courtney Lauren Mari Nelson, Bailey Gomer, Ryan Michael Van Asten and Bethany Raye Franklin (102)

Faculty Mentor/Collaborator: **David C. Jewett**

Developing Baseline Performance in an Animal Model of Learning and Memory

We are using a repeated acquisition task to develop an animal model of learning and memory. Once this model is established, we will use this paradigm to study the chemical and neural mechanisms that underlie learning and memory. During daily training sessions, animals are required to learn a specific sequence of responses from a set of three response alternatives in order to earn food reinforcers. The correct sequence is changed daily, and subjects can earn up to 60 reinforcers in a 45 minute session. For the first few sequence completions, the subject should perform at around chance levels or at about a 67% error rate. As the subject completes more of the sequences during the session, there should be a reduction in error rate as learning occurs. After several exposures to different sequences, each subject may develop a stable learning curve with more errors at the beginning of the session and fewer errors at the end of the session. Individual subject differences in baseline learning curves will be evaluated along with differences in time required to develop a stable baseline. Comparisons between the sequences in the average number of errors and error rates will also be presented.

Jenna Noel King and Rebecca Ann Berth (134)

Faculty Mentor/Collaborator: **Allen H. Keniston**

Eye-Witness Testimonies: Effects of Reconstructed Memories

Eyewitness testimonies are considered to have a persuasive impact on judges and juries. Our study aims to discover the possible effect on an eyewitness's confidence, accuracy, and the influence of co-witness's information in a lineup decision based on the sex and authority level of a co-witness. This study aims to find at least 125 eligible participants above eighteen years of age. Participants will be asked to partake in an online survey implemented through Qualtrics. Within the survey, participants will view a video clip of a shoplifting scene followed by a voice recording of a co-witness. They will then rate their confidence levels throughout the survey and finalize their lineup decision. Only the experimental groups will be asked to rate the influence of the co-witness's information. A one-way ANOVA will be employed to analyze the data gathered. It is hypothesized that the data will show males with the highest authority level, such as the police officer, will have the highest effect on the dependent variables of confidence, accuracy, and influence for participants. This study aims to illustrate that there are flaws in eyewitness testimonies and they need to be accurately reviewed before sentencing decisions.

Michael Joseph Kosiak and Steven L. Hochstetler (125)

Faculty Mentor/Collaborator: **Blaine F. Peden**

An Analysis of Personality Type and Relationship Desirability Within Hook-up Culture

The present study extends previous work which investigated the interaction between male personality type and personality intensity, and its effect on relationship desirability among college-age women. Popular media strongly reflects the notion that "nice guys finish last" when it comes to romantic relationships, while scholarly articles hold conflicting viewpoints on the topic. A handful of studies offer evidence that women prefer dating men with a nice-guy personality. However, other research suggests that men classified as bad boys have more frequent sexual relationships than their nice guy counterparts. The present study seeks to discover the reason for this conflict and establish an empirically driven explanation of it. Interaction between male personality type and the type of relationship desired by women and its effect on desirability for different types of relationships among women will be evaluated. Recently, popular culture and scientific research have taken an interest in the cultural phenomenon of hooking-up. To account for this and expand upon the authors' previous research, the present study will include hooking-up as a relationship type. The results of this study are anticipated to suggest that personality type and type of relationship desired influence women's desirability of relationships with men.

Klaira M. Lerma (175)Faculty Mentor/Collaborator: **Lori A. Bica***Bystander Education: Engaging College Men in Sexual Violence Prevention*

Rates of sexual assault on college campuses indicate that one in four college-aged women have survived a sexual assault. In past prevention programs, putting an end to sexual assault has been looked at as a woman's issue. Prevention involved teaching women strategies to avoid being sexually assaulted. Engaging men in the prevention process was limited. Recently, men have been involved through bystander prevention programs, an approach which leads to preventing sexual assault and reducing rape culture by educating men to be proactive allies and bystanders (Barone, 2007). The purpose of the current study is to assess rape myth acceptance and general knowledge of sexual assault in predicting college men's bystander attitudes and willingness to intervene against sexual assault. An anonymous survey will be distributed to college-aged males involved in fraternities, all male sports teams, all male choral groups, and all male residence hall floors on UW-Eau Claire's campus. The survey will assess rape myth acceptance, general knowledge of sexual assault, willingness to intervene against sexual assault, and bystander attitudes. High rape myth acceptance and low knowledge about sexual assault is predicted to yield low ratings related to bystander attitudes and willingness to intervene against sexual assault.

Amber Rose Marion (182)Faculty Mentor/Collaborator: **Jennifer J. Muehlenkamp***Attitudes Toward Deliberate Self-Injury and Elective Cosmetic Surgery Patients in Emergency Department and Urgent Care Settings*

The focus of this study is to identify differences in attitudes toward deliberate self-injury (DSI) and elective-cosmetic surgery (ECS) patients seeking post-injury care in either an emergency department or urgent care setting. Prior research has shown attitudes and expectations for care differ among health care professionals for ECS and DSI patients, which can directly impact quality of care, but all the research has been correlational. The current study uses an experimental design, presenting one of two scenarios where a young adult woman seeks care in an emergency department for an injury from DSI or ECS. Participants respond to questions assessing attitudes toward the patient and treatment recommendations, questions that gauge training and education, and demographic questions. The questionnaires are being distributed in regional emergency departments and urgent care clinics, and approximately 70 questionnaires have been completed. We expect to find that medical professionals have more accepting attitudes towards ECS patients and that we can use our findings to support the need for training and education in the areas of DSI and ECS treatment.

Kristin Nichole Morgan (161)Faculty Mentor/Collaborator: **Blaine F. Peden***What Makes a Man? A Study of Male Attractiveness*

Mate preferences differentiate in heterosexual females within the aspects of age and type of relationship considered. This study explores how SES (i.e. income) influences the attractiveness of males to heterosexual females. Also assessed is how SES affects the level of desirability to enter into short-term and long-term relationships. One hundred and eleven participants were taken from a sample of Midwestern college students ages 18 to 30. Participants completed a survey in which they were exposed to one of three conditions. Each of the conditions consisted of a photo and participants were asked questions in which they rate the attractiveness of the male and their level of desirability to enter into short-term and long-term relationships with that male. A 3 X 2 between-subjects ANOVA was used to analyze the data.

Katelyn Marie Morrison and Hali Michelle Bebault (222)Faculty Mentor/Collaborator: **April L. Bleske-Rechek***Variable Order and Form of Presentation: Factors Influencing the Inference of Cause-and-Effect from Correlational Data*

Humans have an inherent tendency to infer cause and effect from correlational data. This tendency may lead students to misinterpret data they encounter both in and out of the classroom. For example, when media headlines describe a link between "Variable X" and "Variable Y," students may mistakenly infer that "Variable X" causes "Variable Y." We hypothesized that the order in which variables are presented has an influence on which variable is assumed to be the cause and which the effect; and that the influence of variable order is most robust when correlations are presented both visually and in text. To test our hypotheses, we generated several correlational scenarios and presented each scenario to students in one of six different versions. The versions were created by combining two independent variables: (1) the order of X and Y (X before Y, Y before X); and (2) the form of presentation (text only, scatterplot only, text and scatterplot combined). After

reading, viewing, or reading and viewing each scenario, participants restated the findings in their own words. We present the percentage of students who conflate correlation with causation, and we describe which scenario interpretations were most influenced by variable order and form of presentation.

Alethia Paynia Moua, Mai Neng Vang and Lauryn Larissa Pixler (256)

Faculty Mentor/Collaborator: **Ann D. Collier**

Hmong Sexual Taboos: Hidden Secrets for the Preservation of Reputation

Sexual taboos are very strong in the Hmong culture. It is an issue that is well hidden and not discussed because of the negative implications towards reputation. Hmong sexual taboos will very likely have an impact on child-rearing in Hmong-American children; previous authors have reported that Asian American families feel a need to keep incest or virginity a secret, regardless of whether the perpetrators were family (Zhai and Gao,2008). The focal research goal was to obtain information on how female Hmong college students actually perceive sexual abuse given this sexual taboo. After enlisting feedback from a professional Hmong women advisory group, three focus groups were held with female Hmong college students. Participants were first asked about general Hmong parenting styles and then presented with a hypothetical scenario in which a child had been potentially sexually abused by a relative. The constant comparative approach to qualitative data analysis was used. Results suggested that Hmong parents would respond to sexual abuse with strong shame, anger, loss of face, and possibly force the child into an early marriage. The discussion provides a comparison for how more Westernized Hmong might perceive and act when confronted with similar situations.

Jacob Earl Mulhern (112)

Faculty Mentor/Collaborator: **Blaine F. Peden**

Are We Gambling With the Future of our Children? A Study on the Portrayal and Consequences of Gambling on Youth in Society

The focus of this study is gambling, which has been associated with deviant behaviors such as alcohol abuse, drug use, and other criminal activity. As technology grows it is easier to gain access to gambling mediums through smartphones, laptops, gaming systems and more. Due to this easy accessibility children are able to get onto gambling websites and gambling habits are strengthened through videogames and online play. It is important for us to analyze any potential risks that may arise from our expanding technology. Little research has been done on the topic, so hopefully this study will give important insight and lead us to any other issues that need to be addressed. Through an online survey, distributed to members of many age groups. I will analyze how the use of technology is related to gambling habits and criminal activity, especially if gambling habits begin at an early age. The survey will be sent to high schools, students at the University, and will be distributed online through Facebook. It is my hypothesis that high school students will show higher gambling habits earlier in life due to the fact that it is easier for them to begin gambling at an early age online.

Nathaniel Berninghau Murken, Amy Kay Thoftne, Katie Marie Immerfall, Drew Randall Ivan Nelson and Justine Colette Fize (127)

Faculty Mentor/Collaborator: **Allen H. Keniston**

External Collaborator: **Kathryn Hamilton, UW-Stout**

Should PowerPoint Exclusively Present Images?

PowerPoint is widely used as a lecture aid in classrooms as a visual, an outline, or a framework for lectures; or as a copy of the lecture in text format. Little research has been done on how the nature and limitations of human information processing should guide the construction of PowerPoint slides in order to facilitate benefits to students' recall and comprehension. We propose to perform experiments on the effects of PowerPoint as a visual aid, by comparing recall and transfer of lecture material assisted by images only PowerPoint slides versus slides implementing various combinations of images and text. We expect text slides may interfere with a learner's ability to concentrate on what the lecturer is saying, therefore decreasing understanding and application. We conversely predict that pictures-only slides may facilitate comprehension and recall of lecture material.

Ashley Marie Niebauer (181)

Faculty Mentor/Collaborator: **Andrew Hucks**

Examining Discounting Rates of Healthy Food Choices by College Students

Several studies have examined humans' rates of discounting, however, few studies have applied delay discounting to investigate humans' health-related behaviors such as healthy eating habits. The present study examined the rates of discounting of healthy food choices made by 13 undergraduate students at the University of Wisconsin-Eau Claire. Participants completed a series of discounting tasks after reading a hypothetical scenario and viewing nutrition facts for five McDonald's food items. A health survey completed at the conclusion of the study served as an indicator of lifestyle healthiness of participants. Results of the discounting task suggest that preferences reverse in relation to the number of calories in fast food items. Results also imply that the body mass index of a human does not predict the level of lifestyle healthiness. The present study suggests that disclosing nutrition facts to consumers prior to consumption could result in a reverse of preference for a healthier menu item.

Ee-Jane Ong (158)

Faculty Mentor/Collaborator: **Lori A. Bica**

Communicating About Eating Disorders: Experiences of Friends and Family Members

Eating disorders like anorexia nervosa, bulimia nervosa, and binge eating disorder affect up to 24 million Americans and 70 million individuals worldwide (The Renfrew Center, 2012). Given prevalence rates, many people know someone with an eating disorder. It can be difficult to determine what to say to someone who has an eating disorder or how to help. The purpose of this descriptive study is to investigate the role of friends and family in communicating with individuals who have eating disorders. Interviews will be conducted with UW-Eau Claire students who know someone with an eating disorder. Participants will indicate the nature of their relationship to the person with the eating disorder, relationship length, and degree of closeness. Participants who report never having talked about the eating disorder will be asked what kept them from initiating a conversation and what information/resources would have helped them talk with the person more easily or successfully. Participants who report having talked about the eating disorder will be asked about content, goals, frequency, and depth of the conversations. They will also be asked who initiated the conversations, what was helpful/unhelpful, and what would help them to talk about the eating disorder more easily or successfully.

Lauryn Larissa Pixler, Mai Neng Vang and Alethia Paynia Moua (255)

Faculty Mentor/Collaborator: **Ann D. Collier**

Interventions for Parental Misconduct in Hmong Culture

Child abuse and discipline styles are known to vary across cultures; very little is known about Hmong community practices. Westernized perspectives typically undervalue the principles behind what drives Hmong parenting choices about how to handle misconduct. The purpose of the current study was to explore when child abuse was perceived in a situation, what type of action Hmong parents would take and why. We hypothesized that as the severity of abuse increased, action involving authorities would also increase. The current study was part of a larger community-based participatory research project. After enlisting the feedback of an advisory panel of Hmong professional women, three focus groups were held with Hmong college-aged females. Participants were read four different scenarios and asked what action should be taken. The constant comparative approach for qualitative data analysis was used. First, we found that all scenarios were perceived as having some form of neglect or abuse. Second, we found that action did increase with the severity of the abuse. However, except in the most severe of situations, action often meant enlisting paternal elders rather than governmental authorities. This information will be helpful when designing Hmong parenting classes that are tailored to values and culture.

Katherine Emily Quigley and Carolyn Margaret Kolb (147)

Faculty Mentor/Collaborator: **April L. Bleske-Rechek**

External Collaborator: **Lyndsay A. Nelson, East Tennessee State University**

The Double-Edged Nature of Female Friendship: Attractiveness and Rivalry in Friendships between Women

One explanation for the intimate yet fragile nature of young women's same-sex friendships is that female friends are both allies and competitors in mating. We conducted two studies on the link between mating rivalry and physical attractiveness among female friends. In Study 1, friends completed questionnaires and were measured and photographed in their street clothes and then in scrubs. In Study 2, a second set of female friends underwent similar protocol except that they were photographed in a two-piece swimsuit. In both studies, separate sets of college student "judges" from other universities rated the pictures for face, body, and full-body attractiveness. In both studies, ratings of friends' full-body attractiveness

were correlated ($r > .40$). In Study 1, dressed in scrubs, friends' bodies were not rated as similarly attractive, but their waist-to-hip ratios and bra cup sizes were similar. Study 2 replicated the similarity between friends in body shape measurements; moreover, when women's bodies were exposed via swimsuits, they were rated as similarly attractive. In both studies, less attractive friends reported more mating rivalry. Women rated their friend more highly than themselves when comparing with other women, but that friend enhancement bias vanished when women compared themselves directly with their friend.

Katherine Emily Quigley and Emily Carol Prosser (148)

Faculty Mentor/Collaborator: **Jennifer J. Muehlenkamp**

Health Professionals' Knowledge and Attitudes toward Non-Suicidal Self-Injury in United States and Belgium

Non-suicidal self-injury is defined as the intentional harm of one's own body tissue without the intent to die (Nock, 2010). The goal of this study was to cross-culturally examine the attitudes of mental health professionals toward individuals who self-injure and identify differences and similarities between two countries. An online survey was distributed to groups of various health professionals (e.g., psychologists, social workers, nurses) in the United States and in Belgium. The survey included questions assessing overall attitudes toward self-injuring clients, training or experience in self-injury, and confidence working with self-injuring clients. There were many similarities between United States and Belgium. United States participants, however, reported greater comfort and more positive attitudes toward self-injuring clients than did the Belgian participants. The implications of this study can help identify ways in which health professionals around the world can utilize training to create more positive attitudes toward self-injuring clients and provide a more positive atmosphere to promote help-seeking behavior in self-injuring individuals.

Katherine Emily Quigley (137)

Faculty Mentor/Collaborator: **Jennifer J. Muehlenkamp**

Risk and Resilience in LGBTQ Youth: A Critical Review of the Literature regarding Suicide and Self-Injury

Suicide and self-injury (e.g., self-harm) are a major public health problem among today's general population youth, but there is a significantly increased risk for these types of behaviors within the lesbian, gay, bisexual, transgendered, and queer (LGBTQ) youth community. Despite the high prevalence of self-harm within this community, there are significant gaps in the field's understanding of risk and protective factors for suicide and non-suicidal self-injury within LGBTQ youth. A critical review of the empirical literature examining factors linked to increased suicidal behavior and non-suicidal self-injury among LGBTQ teens, as well as resilience factors protecting against self-harm, will be presented. Literature was identified using a variety of search terms related to LGBTQ youth, suicidal, and self-injury behavior. Preliminary analyses indicate that lack of parental support and peer victimization or bullying for being non-heterosexual are dominant risk factors for self-harm unique to LGBTQ youth (Barrett & Bissell, 2009). Additionally, a consistent group of protective factors exist that may serve as a buffer for self-harm behaviors. Based on the literature reviewed, suggestions for preventing self-harm in LGBTQ youth will be offered. Further investigation must be conducted to explore the ways in which these protective factors can be applied to at-risk LGBTQ youth and create positive social changes that help prevent self-harm.

Tehya Mai Rice and Shauna Lee Stoeger (111)

Faculty Mentor/Collaborator: **Blaine F. Peden**

Environmental Advertising: Predicting Environmental Engagement by Exposure to Passive Media

We will study the gap between attitudes of associating oneself with environmental behaviors and environmental behaviors on campus. We want to assess the attitudes of students and find whether passive media is a good way to increase awareness regarding these topics. Assessing the perception of our students can help impact how funds for sustainability on campus are allotted. We hypothesize that passive media around campus will create awareness regarding sustainability, thereby bridging the gap between perceived actions and actual actions. We will study the new campus ride board, Zimride, and why students decided to join. We will random sample participants' amount of exposure to the media advertising used, perception of sustainability on campus, use of sustainable resources, and self-reported environmental behaviors using a version of the environmental attitudes scale (Korfiatis, Hovardas, and Pantis, 2004). We will analyze the data in Statistical Package for the Social Sciences (SPSS) with a multiple regression analysis to predict usage of Zimride based on reported environmental attitudes. We expect to find effective methods to raise environmental awareness that can be applicable to a broader audience outside UW-Eau Claire. This information will be useful for determining future methods of disseminating environmental information on a campus setting.

Sarah Joseph Richardson, Kaetlyn Leah Graham and Michael Peter Schiel (151)

Faculty Mentor/Collaborator: **Allen H. Keniston**

Using Empirical Article Analyses to Assess Students Learning of Psychology Research Methods

We used an article analysis to assess the success of UW-Eau Claire's psychology department's goals for student learning and application of research methods. Our work responds to the need for assessments that provide "constant feedback and improvement" while undergraduates learn, rather than after they graduate. Replicating work at a peer institution, our goals include evaluation of undergraduate participation in the assessment process and the power of undergraduate article analyses to provide diagnostics concerning the department's success at teaching specific goals. To date, 420 undergraduates at four course levels have completed an article analysis developed at Eastern Connecticut State University. The analysis measures skill at using critical thinking and identifying factual information in a research report. Performance on individual analysis items assesses students' achievement of specific student learning outcomes. A team of three undergraduates and one professor scored the analyses. Data collection is complete; analyses are pending. We expect improvement across course levels on fact identification and critical thinking scores, larger improvements on critical thinking scores, significant correlations between number of psychology courses taken and analyses scores, diagnoses of the department's teaching of research methods, and proof that undergraduates are effective participants in the assessment process.

Danielle Elizabeth Ryan and Heather D. Harris (207)

Faculty Mentor/Collaborator: **April L. Bleske-Rechek**

Science Literacy Among University Students: A Cross-Cultural Comparison of Students in Eau Claire, WI and Students in Stirling, UK

Acceptance of evolution in adult America is relatively low according to absolute standards, with an estimated one in 20 Americans meeting basic requirements for science literacy (Miller, 1998). However, the U.S.A ranks high among other countries in science literacy, which some scientists credit to required exposure to scientific courses in college (Hobson, 2008). To measure the assumed influence of a college education, previous research conducted at the University of Wisconsin-Eau Claire investigated the levels of science literacy among university students as a function of point in college career, discipline, and sex. The data showed seniors' levels of science literacy were significantly higher than freshmen levels, indicating that science literacy may increase over the course of a college education. Researchers of the same lab traveled to Stirling, UK this past October to survey students in different points of their university career to compare levels of science literacy between students in the UK to students at UW-Eau Claire. In this poster, we describe the results of a cross-cultural study designed to measure how differences in literacy scores of entering and exiting students vary by university, and whether there are notable differences in science literacy and knowledge of evolution.

Danielle Elizabeth Ryan, Stacy Marie Miller, Amanda Ruth Werner, Amy Elizabeth Johnson, Katherine Emily Quigley and Carolyn Margaret Kolb (208)

Faculty Mentor/Collaborator: **April L. Bleske-Rechek**

That's Too Bad... Not! Predictors of Feeling Pleasure in Response to Another's Misfortune

"Schadenfreude" is a feeling of pleasure in response to another's misfortune. Past research has documented that people are most likely to feel schadenfreude toward members of the same sex whom they dislike or envy. We extended previous research on schadenfreude in two ways. First, we manipulated the closeness of the target person suffering the misfortunes (in terms of genetic relatedness and liking). Participants were assigned to imagine one of four possible targets, as applicable: an identical twin, a same-sex fraternal twin, a close same-sex friend, or a same-sex member of their social network whom they would not consider a friend. Second, we asked participants to imagine their target experiencing misfortunes across an array of domains related to reproductive success (social status, financial status, occupational success, attractiveness, and mating success). We hypothesize that men and women will feel more schadenfreude toward a target they dislike, but that genetic relatedness will moderate that effect. We also expect that women will report more schadenfreude in response to misfortunes of attractiveness and that men will report more schadenfreude in response to misfortunes of financial status. We describe the conditions under which people feel the most pleasure and sympathy in response to others' misfortune.

Danielle Elizabeth Ryan (221)

Faculty Mentor/Collaborator: **April L. Bleske-Rechek**

Age Variation in Mating Strategies and Mate Preferences Among College Students

Past research has documented systematic similarities and differences in men's and women's mate preferences and mating orientations (attitudes toward long-term partnerships and short-term sexual relationships). However, one area of mating research that relationship scientists currently know little about is change over time in individuals' mating orientations and preferences. To address this knowledge gap, we surveyed broad samples of students at UW-Eau Claire. Participants completed a questionnaire on relationship attitudes, mate preferences, and mating desires. Contrary to previously documented beliefs on behalf of college students that college students become less oriented toward opportunistic sex and physical appearance as they go through college (Bleske-Rechek et al., 2009), we found that students among all ages did not differ in their attitudes about long-term relationships, nor did they differ systematically in their mate preferences. Freshmen differed from older students in attitudes about short-term mating and in relationship experience, but these variations were absent among students of sophomore status and above. Sex differences in mate preferences and mating orientations, on the other hand, were apparent among all ages. We discuss the importance of acquiring prospective data on college students to provide more conclusive data on individual change over time in mate preferences and mating desires.

Michael Peter Schiel and Kaetlyn Leah Graham (149)

Faculty Mentor/Collaborators: **Blaine F. Peden** and **Allen H. Keniston**

The Impact of Colored Text on Leet Speak Comprehension

Two studies explore the effects of automatic processing and interference in the Stroop Task using leet speak, a written communication that substitutes symbols and numbers for the English Alphabet. The Stroop Task pits conflicting learned responses against each other to test hypotheses about learning and attention processes. Study One investigated interference effects of leet speak using the Stroop Task that presented lists of color names written in leet (e.g., ORANGE - 0Я4/V93). In one condition, the color names were written in colored text congruent with the leet word; in another condition, color names appeared in an incongruent color. Participants identified the colors of the leet words in a list and recorded the time they took to do so. No significant interference between word meaning and text color appeared in the pilot study, yet learning to read in leet did occur. Study Two, currently in progress, will explore the reverse process in terms of participants' ability to read lists of leet words written in black vs. colored text.

Roxanne Stephanie Schmidt (101)

Faculty Mentor/Collaborator: **Jeffrey A. Goodman**

LGBTQ Mentoring Needs Assessment

The goal of creating an LGBTQ needs assessment was to discover whether or not students at the University of Wisconsin – Eau Claire felt a need for LGBTQ-specific mentoring support. Assessing the importance of mentoring for LGBTQ students is vital because it allows students and faculty to acknowledge where there is a lack of assistance so that we may progress forward and improve services. The needs assessment was administered through Qualtrics and included a combination of qualitative and quantitative questions and scales. Results indicated that the majority of respondents felt positively about the development of the Peer Haven mentoring program. Furthermore, participants conveyed their preferences for the types of programming they would like to see and shared their perceptions of the benefits of such a program. These and other results from the LGBTQ needs assessment will be used in conjunction with the creation of Peer Haven, a new LGBTQ mentoring program, to increase the university community's ability to respond to LGBTQ students' wants and needs in a way that aligns with best practices and the needs of stakeholders.

Gretchen Elaine Schultz and Tarama Lynne Poncelet (174)

Faculty Mentor/Collaborator: **Jeffrey A. Goodman**

Secular, but not Religious, Coping Predicts Self-Control

Americans believe that, if we were more religious: crime would go down (79%), the quality of parenting would increase (85%) and people would spend more time volunteering (87%; Farkas et al., 2001). This suggests a common assumption that religious beliefs enable a person to resist temptation, do what's right, and persist through difficult times. In psychological terms, most Americans believe that religious beliefs afford greater ability to regulate and control our behavior. To test this assumption, we asked UW-Eau Claire students and online participants across the country (N = 269) to complete measures of religious coping, secular coping, and self-control. Participants also indicated their sex, age, religious beliefs, and whether or not they had a condition that would impair their ability to study (i.e., ADHD). Regression models indicated that sex, age, and psychological condition were significant predictors of self-control (Model 1). Religious beliefs did not predict self-control.

Religious coping appeared to predict self-control (Model 2); however the inclusion of secular coping (in Model 3) negated the significance of religious coping. The assumed self-control benefits of religious beliefs can be explained by secular coping. Our findings make novel theoretical and practical contributions to the psychology of self-control and religion.

Haley Marie Kastler Steinhauser (223)

Faculty Mentor/Collaborator: **Andrew Hucks**

Evaluation of Probability Discounting: A Comparison of Real and Hypothetical Rewards and a Molecular Analysis of the Effect of Recent History on Discounting

The current study evaluated whether there is a reward effect in probability discounting, and analyzed the effect of recent histories on probability discounting. The first part of the study compared the probability discounting of real and hypothetical rewards, using two roulette-type wheels. The likely-win wheel remained at a high probability of winning and a lower objective value, while the risky-choice wheel involved a lower probability of winning and a consistent higher value. Participants chose between a likely-win wheel and a risky-choice wheel in a hypothetical reward condition and a real reward condition. The second part of the study consisted of collecting probability discounting data with the same roulette-type wheels representing a likely-win and a risky-choice. Participants discounted points that were directly related to a monetary reward at the end of the experiment. Each individual's degree of discounting was analyzed based on a win to loss ratio, in order to determine if experienced wins and losses in a practical discounting task affects the degree to which individuals discount. The results of the analysis will suggest whether or not the ratio of wins to losses affects the probability at which a likely win and a risky choice are of equal subjective value.

Mai Neng Vang, Alethia Paynia Moua and Lauryn Larissa Pixler (254)

Faculty Mentor/Collaborator: **Ann D. Collier**

The Influence of Cultural Values on Hmong Parenting Styles and Perceptions of Abuse

Traditionally, Hmong parents have disciplined their children by using physical punishment, scolding, guilt-induction, rejection, and criticism (Supple & Small, 2006). Although these practices worked well in Southeast Asia, they have been met with criticism in the USA. This study, as part of a larger community-based participatory research project exploring Hmong parenting styles, focused on the values underlying Hmong child-rearing practices, especially with females. We developed two culturally sensitive scenarios that asked participants about parenting styles and perceptions of abuse. After enlisting the feedback of an advisory panel of Hmong professional women, three focus groups were held with female Hmong college students. The constant comparative approach for qualitative data analysis was used. As expected, results suggested that Hmong parenting styles and perceptions of abuse were strongly based on cultural values. Parents also held very different age expectations of their children than in traditional western culture. The current study emphasizes that more in-depth analyses of Hmong parenting principles are needed in order to fully understand and appreciate the cultural values underlying child treatment.

Valerie Lynn Vantussi and Brittany Anastasia Degner (245)

Faculty Mentor/Collaborator: **Kevin P. Klatt**

Habit Reversal Training to Treat Tics in a Young Boy Diagnosed with Tourette Syndrome

Gilles de la Tourette syndrome (Tourette syndrome) is a neurological disorder which becomes evident in early childhood or adolescence before the age of 18 years. Tic symptoms, however, also fluctuate as a function of the environment (Leckman & Cohen, 1999) posing the possibility that a behavioral intervention may be effective in managing tics. Habit Reversal Training (HRT) (Azrin & Nunn, 1973) is a multi-component behavioral treatment package for suppressing nervous habits and tics by teaching awareness of the behavior and engaging in a competing response (incompatible behavior) to replace the nervous habit or tic. By the use of awareness training (first component of HRT), a 2011 study demonstrated a decrease in tic frequency for a nine-year-old boy diagnosed with Tourette syndrome. The current research extends the 2011 study by involving the parents (of the same participant) in all components of HRT instead of traditionally involving parents as the final component. The current research implements a competing response condition following awareness training.

Nicole Marcella Weber and Jasmine Marie Radke (110)

Faculty Mentor/Collaborator: **Blaine F. Peden**

The Effects of Multimedia Learning on Retention of Basic Credit Knowledge

Many college students lack an adequate knowledge of credit—especially concerning considering the recent foreclosure crisis and rising number of student loan borrowers in default. This project has the purpose of finding the best multimedia method to provide basic information about credit to college students. College students were examined to see which multimedia

method of learning results in the most retention. Our research followed multimedia theory and examined three forms of multimedia technology: a PowerPoint presentation with just text, one with text and pictures, and a multimedia presentation that limited text and emphasized pictures and narration. Students were randomly assigned to one method and then tested on their retention of the information using a one-way ANOVA. Our expectation is that the students who are in the multimedia condition will have better retention than the students in the other two conditions. The outcome of this project would then support using quick and engaging methods to teach college students about important information.

Joseph J. Weirich (109)

Faculty Mentor/Collaborator: **Lori A. Bica**

Recruitment, Retention, and Advancement of Female STEM Students at the University of Wisconsin-Eau Claire

The purpose of this study is to determine if barriers exist limiting recruitment, retention, and advancement of traditional-age female students in science, technology, engineering, and mathematics (STEM) disciplines at UW-Eau Claire. Evidence suggests that female faculty recruited at higher rates bolsters recruitment and retention of female students (Neumark & Gardecki, 1998). Interviews will be conducted with female students majoring in biology, chemistry, physics, computer science, and geology, as well as a comparison sample of female students representing non-STEM disciplines. For recruitment, interview questions focus on how attracted participants are to their major and awareness of gender differences in involvement (e.g., Did the number of female students/faculty influence your choice of major?). Retention questions focus on resources and support from faculty and other students (e.g., Do you notice a difference in the number of female and male professors or advisors in your major?). Advancement questions focus on preparation for post-graduation plans (e.g., How often are you asked by faculty members or your advisor about post-undergraduate plans such as graduate school?). We hypothesize that majors with greater numbers of tenured female faculty members will be associated with higher satisfaction levels with respect to recruitment, retention, and advancement of female students.

Amanda Ruth Werner, Amber Rose Fritsch and Jennifer Lorraine Johnson (206)

Faculty Mentor/Collaborator: **April L. Bleske-Rechek**

Siblings, Friends, and Mates: Development of a Word-Pair Association Task to Measure Implicit Sexual Response to Different Relationship Partners

In heterosexual samples, men report more sexual attraction to their female friends than women do to their male friends. A popular explanation for this phenomenon is that men are socialized to sexualize women. However, an alternative explanation posits that men have stronger desires for sexual novelty and variety, with those desires activated in the presence of reproductively viable females. We designed a study to pit these explanations against one another. Heterosexual men and women were randomly assigned to think of either an opposite-sex sibling, their romantic partner, or an opposite-sex friend. After responding to open-ended questions about their target, participants completed a task designed to assess sexual thoughts. Participants viewed a variety of word pairs, many of which included words that could be interpreted sexually depending on one's frame of mind (heat, long, ...) and rated each pair for how related the words are. We expect that men will interpret ambiguous words sexually only after having written about their romantic partner or opposite-sex friend. We also expect that men's and women's sexual responses on the word-pair task will correlate positively with their explicit reports of sexual attraction to the target.

SERVICE-LEARNING

Tia Joann Oestreich, Samantha Jo Pettit, Kinsey Patricia Thompson, Tehya Mai Rice and Shauna Lee Stoeger (263)

Faculty Mentor/Collaborator: **Donald D. Mowry**

Transformative Learning, Study Abroad, & Global Service-Learning in Costa Rica/Nicaragua: Program Partner and Host Community Perspectives

Transformative learning can produce disorienting challenges for students. It can result in changes in their frames of reference that lead to enriching the meaning of their experiences and enhancing their education. It has been suggested that study abroad excursions with home-stay and service-learning components cause transformative learning, as well as benefits of service-learning projects that contribute to sustainable economic, social, and cultural development for the communities that are served. As students concerned with personal responsibility towards social justice and cultural sensitivity, we believe in the transformation and benefits attained from international service-learning projects and home-stay study abroad experiences. To test our hypothesis that home-stay study abroad excursions and international service-learning projects offer transformational learning and community benefits, we traveled to Costa Rica and Nicaragua to conduct qualitative interviews with families

that host students in order to gain their insight on the students' transformations, as well as the effects that hosting students has had on their families and communities. We anticipate that the family members have noted transformations in their students including broadened outlooks, discovery of values, and growth as adult individuals, as well as their assistance in the development of sustainable projects that benefit the community.

Tia Joann Oestreich, Kinsey Patricia Thompson, Samantha Jo Pettit, Tehya Mai Rice and Shauna Lee Stoeger (264)

Faculty Mentor/Collaborator: **Donald D. Mowry**

Transformative Learning, Study Abroad, & Global Service-Learning in Costa Rica/Nicaragua: Student Perspectives

The transformative learning theory suggests that students' educational experiences in and outside of the classroom cause disorienting challenges that result in changes in their frames of reference that lead to enriching the meaning of their experiences and, therefore, enhancing their education beyond basic content acquisition. It has been suggested that study abroad excursions with service-learning components offer to students transformative learning that develops their critical thinking capacity in terms of their individual selves and the societies around them. As students concerned with personal responsibility towards social justice, we believe that service, social responsibility, and cultural sensitivity are of utmost importance. Moreover, we have all completed service-learning projects abroad and have benefitted personally and educationally from the transformations that it initiates. To test the hypothesis that study abroad excursions with service-learning components offer transformational learning, we gauged students' preliminary and subsequent opinions on their personal educational and study abroad experiences by collecting and assessing surveys with quantitative and qualitative responses. We propose that that the students' responses will lead to the conclusion that study abroad experiences coupled with service-learning projects offer students challenging experiences and changes in frames of reference that can be characterized as personally and educationally transformative.

SOCIAL WORK

Alyssa Grace Knoll (260)

Faculty Mentor/Collaborator: **Vanda Galen**

Sense of Place

'Sense of place' is defined in social theory as an emotional, physical, and spiritual connection to a place. This qualitative research combines a literature review on the 'sense of place' as a social theory with real life experiences gathered through oral interviews over the telephone. Key informants who have created and maintained careers or activism related to promoting and preserving the culture and environment of Appalachian Eastern Kentucky will be interviewed. The research on social theory of 'sense of place' and personal experiences of key informants documents the use of a 'sense of place' to define and maintain a culture. Writers, musicians, sociologists, and social activists have observed a strong sense of place in southern Appalachia. Although the economy has caused much out-migration, emigrants have retained an attachment to the area. The desire to remain in the area, although opportunities are limited, has also impacted the life chances of residents who remain. One of the defining elements of the culture, the mountain terrain, is now under threat by extractive industries. The study looks at what creates and maintains a sense of place and what may be lost as the place is irreversibly altered.

Joan Christine Laundry and April Lynne Unterberger (140)

Faculty Mentor/Collaborator: **Lisa Quinn-Lee**

Death Anxiety and Burnout among Hospice Social Workers in Wisconsin and Minnesota

The purpose of this study is to gather information about hospice social workers' experiences working in hospice and to learn whether death anxiety is associated with the formation of burnout among hospice social workers in Wisconsin and Minnesota. There needs to be more research to increase the knowledge about how many hospice social workers experience death anxiety and burnout. The more we know about these topics, the more we can begin to help professionals who work in this field. A mixed methods approach was used for this study. In order to assess burnout, the Maslach Burnout Inventory (MBI) was utilized. The Death Anxiety Questionnaire (DAQ) was used to measure death anxiety. Qualitative data was gathered by asking several open-ended questions about participants' experiences. The data is still being analyzed, but the results we expect to be able to report are correlations between death anxiety, burnout, and experiences in hospice.

Kristin Renee Rector (142)

Faculty Mentor/Collaborator: **Leah Olson-McBride**

Measuring Harm Reduction from Mental Health Court Participation

The goal of this research was to determine the effectiveness of a Mental Health Court with respect to harm reduction seen in the participants' situation. Mental Health Courts help nonviolent offenders who have been diagnosed with a mental illness or co-occurring mental health and substance abuse disorders receive needed services. In order to obtain data, the researcher looked at case files and interviewed both the participant and their immediate social worker. The data was then coded to turn qualitative data into quantitative data. This allowed for visualizing and calculating the change seen in the Mental Health Court participants. Research found that since entry to the Mental Health Court, most participants have not committed any illegal acts. Participants who used to use alcohol and/or drugs five or more times per week cut their use to significantly less than once a week. The mental health symptoms seen for the participants were greatly reduced due to medication regimes provided. All participants have more job-related income, rely less on income support from others, and receive more help from government benefits. Finally, the participants moved to more stable placements for living arrangements after entry to the Mental Health Court.

Kinsey Patricia Thompson, Alyssa Jean Colwitz, James Terry Eichman-Doud, Marguerite Elizabeth Gilbertson, Benjamin Warren Grohn, Tyler Lawrence Howland-Seger, Patricia Jo Rupnow-Tabb, Ntxinco Thao and Allison Lee Turkowitch (262)

Faculty Mentor/Collaborators: **Leah Olson-McBride** and **Holly T. Hassemer**

Examining the Impact of Early Exposure to Undergraduate Research on Collegiate Bridge Students

This project was designed to examine the impact of the high-impact practice of undergraduate research on retention and engagement rates of academically at-risk students at UW-Eau Claire who are part of the Collegiate Bridge program. Social Workers value enhancing people's capacity and opportunity to change and address their own needs. Therefore the actual research project was conducted by the Collegiate Bridge students through GEN 100 curriculum that involved the integration of an undergraduate research component. Throughout the course of the GEN 100 class, the student researchers worked with a faculty mentor and a student mentor to design, refine, and pilot the interview protocol, as well as to collect and analyze the data. The projects were focused on ascertaining additional factors that may lead to academic success for at-risk students. The data analysis is still in progress but we hope to see that student research for academically at-risk freshman increases retention and university engagement rates.

SOCIOLOGY

Bryton Allen Fredrick (122)

Faculty Mentor/Collaborator: **Jeff S. Erger**

Belief, Social Identity, and Sexually Transmitted Infection Risks Among UW-Eau Claire Students

A survey of the sexual history, behaviors, and knowledge of 193 UW-Eau Claire students was conducted. The surveys were analyzed using multiple linear regression in SPSS. Results show women to perceive sexual risks to be higher than men, sexually active people are more knowledgeable about risks while non-sexually active people overestimate risk, and those who perceive higher level of STI (sexually transmitted infection) risk are more likely to report always using condoms. Women are less likely to discuss sexual history of their partner before engaging in sex. Heterosexuals report less discussion of sexual history, less regret after sex, less unanticipated sex, and fewer "friends with benefits". People who expect strongly negative reactions from their friends should their friends find out they had sex without a condom engage in less risky behavior. Higher frequency of alcohol consumption leads to increased unanticipated sexual encounters. The results show that although there is a low prevalence of STIs on campus, the conditions exist for a relatively rapid spread of STIs in parts of the student population. Potential interventions to create a lower level of STI risk on campus, based on social identity theory, are proposed.

John Michael Hilgendorf and Justine Amy Cornelius (121)

Faculty Mentor/Collaborator: **Jianjun Ji**

Health Status of the Chinese Elderly: A Relationship between Demographic and Socioeconomic Characteristics

In developing this project, we used the China National Survey data in an attempt to examine the health status of the Chinese elderly. Three hypotheses were developed and tested to help understand characteristics among Chinese elderly and perceived health status. The first hypothesis stated diseases among the Chinese elderly vary. Secondly, we anticipated the socioeconomic and demographic characteristics of the Chinese elderly to also vary. And finally, health status among Chinese elderly is associated with their socioeconomic and demographic characteristics. The goal of the project is to evaluate which characteristics have a significant effect on perceived health status. We used previous literature, Sociological theories, and statistical methods to discover the findings. Chi-Square, Craver's V, and tau-c were used to calculate whether the relationships were significant or not. Our results indicated that most of our socioeconomic and demographic variables were associated with perceived health status and we offer explanation to the few that were found to not be significantly related. Based on the findings, we discuss the need for policies that may be developed and implemented to address disparities.

Kevin Michael Reinhold (115)

Faculty Mentor/Collaborator: **Jeff S. Erger**

Political and Religious Orientations, Social Involvement, and Student Satisfaction with College

144 students at the University of Wisconsin-Eau Claire (UWEC) were surveyed on their religious and political orientations as well as their experiences on campus. Preliminary results show students who belonged to more campus groups had a significantly higher overall satisfaction with UWEC. Those with more close friends on campus had a significantly higher educational, social, and overall satisfaction with UWEC. Neither Religious nor Political orientation was related to students' educational, social, or overall satisfaction with UWEC, nor with number of friends or membership in campus organizations. Christians are significantly more likely to strongly recommend UWEC to others, and women are less likely to see college as living up to their expectations. Overall, joining campus organizations, connecting with people outside of those organizations, and seeing campus as being open to ideas are strongly associated with satisfaction with the UWEC experience. Despite what many would assume, the data does not indicate any negative effects of perceived bias on religious or political minorities on campus in terms of their satisfaction with UWEC.

WATERSHED INSTITUTE FOR COLLABORATIVE ENVIRONMENTAL STUDIES

Lisa Marea Karnish (96)

Faculty Mentor/Collaborator: **Karen G. Mumford**

Qualitative Document Analysis of Sustainability Plans among Wisconsin Communities

Local level sustainability efforts are growing among communities throughout the United States. Communities in states such as Wisconsin have developed specific plans to enable implementation of sustainability initiatives. The purpose of this study is to compare and contrast current sustainability plans among Wisconsin communities of different sizes to identify the types of strategies each community proposes to implement and the rationale for selecting these strategies. A qualitative document analysis of sustainability plans was conducted among nine Wisconsin communities that vary in population size (below 50,000; between 50,000 and 100,000; and over 100,000). A preliminary review of plans assisted in the development of a coding strategy. This strategy was then tested, revised and finalized. Documents from the nine communities were then reviewed and coded. Preliminary review indicates differences across sustainability plans relative to how communities define sustainability, motivations for pursuing sustainability, the range of proposed sustainability initiatives, and the role of citizen participation in sustainability planning. Further review will clarify similarities and differences among community plans and highlight implications for the development of regional sustainability indicators and capacity-building strategies to support implementation of sustainability plans.

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