Center of Excellence
for Faculty and Undergraduate Student Research Collaboration

Proceedings of the 17th Annual University of Wisconsin-Eau Claire Student Research Day

April 27, 28 and 29, 2009

Office of Research and Sponsored Programs
University of Wisconsin - Eau Claire
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## Schedule of Events

### Monday, April 27, 2009

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<th>Time</th>
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<th>Location</th>
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</thead>
<tbody>
<tr>
<td>7:00 – 8:30 a.m.</td>
<td>Students set up posters</td>
<td>Zorn Arena</td>
</tr>
<tr>
<td>8:30 – 8:45 a.m.</td>
<td>Judges’ orientation</td>
<td>Gold Room, Zorn Arena</td>
</tr>
<tr>
<td>8:45 – 3:00 p.m.</td>
<td>Judging (lunch ~11:30 in Dulany)</td>
<td>Zorn Arena</td>
</tr>
<tr>
<td>Noon – 5:00 p.m.</td>
<td>Poster session open, with student presenters at posters from Noon to 4:00 p.m.</td>
<td>Zorn Arena</td>
</tr>
<tr>
<td>4:00 – 5:00 p.m.</td>
<td>Student Research Day reception</td>
<td>Tamarack Room, Davies Center</td>
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<tr>
<td>~4:15 p.m.</td>
<td>Reception Welcome Address: Chancellor Brian Levin-Stankevich</td>
<td>Tamarack Room, Davies Center</td>
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<tr>
<td></td>
<td>Program: Announcement of UWEC Student Research Day awards and Kell Container Corporation Collaborative Research Scholarship</td>
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</tbody>
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### Tuesday, April 28, 2009

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 a.m. – 6:00 p.m.</td>
<td>Poster session open to University community and public</td>
<td>Zorn Arena</td>
</tr>
<tr>
<td>10:10 – 11:00 a.m.</td>
<td>Science/Math student presenters welcome high school students</td>
<td>Zorn Arena</td>
</tr>
</tbody>
</table>

### Wednesday, April 29, 2009

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 – Noon</td>
<td>Poster session open to University community and public</td>
<td>Zorn Arena</td>
</tr>
<tr>
<td>Noon – 1:00 p.m.</td>
<td>Students remove posters</td>
<td>Zorn Arena</td>
</tr>
</tbody>
</table>
Judges

Arts & Humanities
Kate Maple, Assistant Dean for Student Services, College of Design, University of Minnesota, Twin Cities

Behavioral & Social Sciences
Kelly Herold, Associate Professor of Communication Studies, Winona State University
*Harry Kaiser, Gellert Family Professor of Applied Economics and Management, Cornell University
Jeffrey Ratliff-Crain, Professor of Social Sciences, University of Minnesota, Morris

Business & Professional Studies
*Bill Klish, M.D. Gastroenterology, Hepatology and Nutrition, Baylor College of Medicine
Alison Schmidt, Associate Professor of Education, Department Chair, The College of Wooster

Natural & Physical Sciences
Jason Cody, Associate Professor of Chemistry, Department Chair, Lake Forest College
Dan Flath, Visiting Professor of Mathematics and Computer Science, Macalester College
*Terri Hogue, Assistant Professor of Civil and Environmental Engineering, University of California, Los Angeles
*Michelle Solensky, Assistant Professor of Biology, The College of Wooster

*UW-Eau Claire Alumni

Acknowledgments

Many people helped to make this event possible, and we heartily thank them for doing their part cheerfully and efficiently:

- **Karen Stuber, Christine Henricks and Event Services staff**—for arrangements in Zorn and Davies Center.
- **Gene Olson and moving crew**—for carefully transporting poster panels to the arena.
- **Jason Jon Anderson and University Stage Crew**—for setting up the arena.
- **Terri Knudtson, Kristine Hessler and the Catering staff**—for producing delicious victuals for the judges and for the reception.
- **Betty Feia, Shawn Seuferer, Ally Buccanero and Emily Elsner Twesme**, ORSP office staff members—for helping with myriad organizational details.
- **Justin Vajko**—for the design of the cover of this abstract volume and Research Day publicity materials.
- **Melissa Davey Castillo**, Graduate Assistant—for compiling this abstract booklet and keeping track of participants and poster locations.
- From **Learning and Technology Services, Gene Leisz and the BITS trainers**—for providing training in poster design and creation; **Help Desk employees**—for managing the increased load of poster printing with apparent ease; and **Rick Mickelson and Bill Hoepner**—for recording the event with their cameras.

Lastly, we thank student participants and their faculty mentors for all the hard work that led up to the polished presentations that are displayed at this 17th Annual UW-Eau Claire Student Research Day.
Arts and Humanities

English

Anna Merry (33)
Faculty Advisor/Collaborator: Erica Benson
Attitudes toward Language Variation and the Liberal Arts

In this pilot study, we empirically assess students' attitudes with respect to several myths of English usage in the United States, including the myths that language use reflects a speaker's intelligence and that only certain groups of people have dialects, among others. We are interested in finding out how widespread these beliefs are at the University of Wisconsin-Eau Claire, an institution committed to liberal education, since we believe that such beliefs—and their propagation in the education system—hinder progress towards several goals of the baccalaureate degree at UWEC, including "knowledge of human culture," "critical thinking," and "respect for diversity among people."

Leanne Miller (23)
Faculty Advisor/Collaborator: Ruth Cronje
Usability Testing the NatureMapping Website

Usability testing is a procedure that tests the functionality of a document or website by asking subjects to complete tasks typically performed by users of the site. During August and September 2008, Dr. Ruth Cronje and Ms. Leanne Miller evaluated the NatureMapping website's intended functionality: navigability, comprehensibility, validity, and reward through usability testing. The NatureMapping project is one of the primary mechanisms by which data are being collected about nongame and nonendangered species in Wisconsin and is an important tool for educating the public about Wisconsin wildlife and wildlife research. Two cohorts of subjects served as testers for the site: seven citizens trained by Beaver Creek Citizen Science Center to be NatureMappers, and seven UWEC students who represented "untrained" users. Users did not demonstrate thorough understanding of the tools and features of the website. Modifications to the website to make it easier to navigate and understand will increase interest in the site. Improvements to facilitate valid data entry could improve the quality of data entered. Many users indicated they'd be likely to use the NatureMapping website if it were improved. If improved, this test indicates that the NatureMapping website can fulfill its intended functions.

Gregory Paules (48)
Faculty Advisor/Collaborator: Erica Benson
I need out because he wants in the house: The Subject Pronoun in Need and Want Phrasal Constructions

Growing in interest among American English linguists are the phrases containing need or want plus a prepositional adverb (e.g., "I need out.") or a prepositional phrase (e.g., "He wants in the house."). The geographic distributions of these constructions have already been established in the field of linguistics (e.g., Kurath 1949, Benson 2008); however, syntactic characteristics of the sentences these constructions occur in have received little to no attention. We explore the frequency of different types of subject pronouns (e.g., "I", "he") and the role those pronouns play in the acceptability of various types of need and want constructions, which are believed to be spreading from the Midland dialect area in the central United States. We have compiled a corpus of examples of need or want with either a prepositional adverb or prepositional phrase found in press and internet sources in American English. The data will be compared to the pronoun frequencies found in both the spoken and written portions of the Corpus of Contemporary American English (Davies) and the Frequency Analysis of English Usage (Francis and Kucera 1982).
Heidi Wieland (24)
Faculty Advisor/Collaborator: JoAnne Juett
*Traditional and Western Healing Approaches to HIV/AIDS Epidemic in South Africa*

My research project looks at current trends in the HIV/AIDS epidemic, specifically in South Africa, and its effects on women. I will be comparing several religious organizations and their responses to the response of traditional healers. I will determine whether each of these types of projected responses are going to help assist those who are currently infected and prevent further cases in the future.

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**English and Student Services**

Lyndsay Nelson and Robert Hart (7)
Faculty Advisor/Collaborator: Debra Barker and Odawa White
*Denver March: A Contemporary Contest Powwow Revealed*

The North American Indian Powwow is a social gathering that brings together Indian Nations in an incredible cultural celebration of song and dance. The powwow is presented in two forms, either a traditional or a contemporary contest. Each form invites American Indians from all tribes, nations, and bands to gather at a designated location. American Indian song and dance is vital for the survival of Indian culture and traditions. This vibrant part of Indian culture and tradition deserves to be documented accurately and in a respectful manner. Seven students from the Native American Student Association (NASA) traveled to Denver, Colorado during Spring Break 2008. The purpose was to film a contemporary contest powwow documentary at the annual Denver March Powwow. The Denver March Powwow was an ideal location for the documentation of a contemporary contest powwow in its original form because it represents one of the largest and most competitive gatherings in North America. NASA recorded songs from each of the drums, eight categories of the dancing, and interviews with dancers, veterans, and an arena director. The documentary provides an educational resource that is an updated and unique perspective on the contemporary American Indian contest powwow.

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**Foreign Languages**

Christopher Gearhardt (59)
Faculty Advisor/Collaborator: Tomomi Kakegawa
*Japan’s Bounded Foreign Policy*

Since the early 1990s, regional instability has pushed Japan to reevaluate the pacifist foreign policy stance it adopted after World War II. In its place, Japan has adopted a more normal outlook on the use of military force which has allowed for the deployment of troops on United Nations-sanctioned missions, closer cooperation with the United States on missile defense, and other changes. However, internal issues such as Japan’s Peace Constitution, aging population, political deadlock, and difficult economic situation all stand as obstacles to the maintenance of this new foreign policy. This research project investigated the specific changes Japan has made to its foreign policy since 1991 and questioned whether the changes that have been made are sustainable given the aforementioned obstacles. By surveying scholarly works written on this topic since 2001, analyzing Japanese government publications, and assessing editorials from leading Japanese newspapers, the conclusion was reached that Japan will be able to maintain its current policies, such as deploying troops in support of United Nations-sanctioned missions and cooperating more closely with the US; but political instability, economic problems, and an aging population will bound Japan from fully normalizing its foreign policy for the foreseeable future.
Rebecca Kopps, Anna Buffington and Carly Kleiber (44)  
Faculty Advisor/Collaborator: Jessica Miller  
Phonetic Variations between Mid-Vowels in Swiss and Standard French

We analyzed mid-vowel pronunciation in both Swiss and Standard French to determine whether a significant difference exists between the two dialects. We did this by analyzing six samples of Swiss French speakers from the Vaud region and comparing them to previously collected data for Standard French phonology. We also measured the magnitude of the differences by using the Praat sound analysis program. It is important to realize that phonetic differences do exist within dialects of French, and that French taught in schools does not necessarily reflect the multitude of dialects of French that are found throughout the world.

Kathryn Lance-Parsoud (70)  
Faculty Advisor/Collaborator: Johannes Strohschänk  
Language over Mind or Mind over Language: The Problem with Fuzzy Agreement

This project analyses the function of restrictive clauses in the languages of French, German, and English, comparing usage and logic through linguistic and historical research. Our investigation focuses on various authentic texts, native to each language, from the 17th century to present along with a field study of modern native speakers. The research has provided evidence that “fuzzy” agreement is indeed occurring in all ages and multiple languages. Trends can be seen in all three languages; however in the research’s current state, the cause of these trends has yet to be determined. Eventually the result of this study, we hope, will provide an in-depth understanding of the role of logic in language, emphasizing the possibility that sometimes it’s language that influences thinking and not vice versa.

Isaac Ledford (69)  
Faculty Advisor/Collaborator: Matthew Waters  
Change and Interchange in the Early Christian Manuscript Tradition

During the first three centuries C.E. of the Roman Empire, biblical manuscripts were manually copied by scribes, who often introduced changes into these texts – both accidentally and intentionally. The intentional changes were of many different types, including theological, apologetic, and anti-Semitic. One type of change that can be found in some ancient manuscripts is anti-feminist in nature, by which is meant that a scribe altered the text so that it projected a bias against women mentioned in the text. Specifically, one fifth century manuscript known as Codex Bezae includes three instances of this sort of change within its text of Acts, Chapter Seventeen. Scholars hotly debate where this ancient book was written, but some of their more plausible suggestions have included North Africa, Egypt, and Jerusalem. Although we know very little about the copyist who inscribed Codex Bezae, it is probable that he had a limited understanding of both Latin and Greek, therefore causing him to make a great number of mistakes. He probably made such textual changes due to his fifth-century understanding of women’s place in the Church; he could not conceive of a first-century Church in which women held high status.

Liliana Meza and Maria Boland (71)  
Faculty Advisor/Collaborator: Analisa DeGrave  
Resource Booklet for New Hispanics in Western Wisconsin

The long-term objective of this collaborative project between the University of Wisconsin-Eau Claire and the non-profit organization Puentes/Bridges is to create a resource that Latinos who are new to Western Wisconsin could use to orient themselves upon their arrival. As a point of departure to create this larger, regional handbook, this project is currently engaged in creating a Spanish language booklet with resources specific to Eau Claire County. To determine the content of the booklet, student researchers conducted a literature review by assessing examples of comparable publications for migrants/immigrants in the United States. Students created and conducted a survey and informal interviews of local Latino business owners as well as area businesses that employ Latinos. Students then compiled the data for the booklet by contacting and meeting with a variety of community members, governmental agencies and
non-profit organizations. While continuing to collect and organize data, materials already obtained are currently being translated into Spanish. In collaboration with a companion project "GIS Mapping for Non-English Speaking Immigrants in Western Wisconsin" (Geography and Anthropology) the location of governmental agencies, organizations and other sites included in the text portion have been plotted on maps that correspond to the different sections of the booklet.

History

Jamie Hoehn (60)
Faculty Advisor/Collaborator: Matthew Waters
Caesar’s Gallic Wars and the Archaeological Record

This project analyzes "De Bello Gallico," a collection of reports written by Julius Caesar and sent to Rome detailing his efforts and progress in Gaul. In addition to relating the political climate and extolling his own martial valor, Caesar also details the social customs and kinship networks of both Gallic and Germanic tribes. This work, originally begun in 58 BCE, has greatly affected the historian’s understanding of Iron Age Europe. Historians have placed a great emphasis on the importance of individual tribes. It has also been generally accepted that many of these tribes subsisted at a relatively primitive level, especially vis-à-vis Rome. However, archaeological evidence is increasingly at odds with Caesar’s accounts. Artifacts and settlements suggest a far greater level of cultural continuity between the “Gauls” and the “Germans,” as well as a higher level of sophistication for the latter. Evidence also suggests moderate assimilation of Gallic and Germanic customs by Romans living on this frontier. Based on the archaeological evidence and new interpretations of “The Battle for Gaul,” our understanding of the interaction between Rome and the Gallic and Germanic tribes is undergoing significant revision.

Music and Theatre Arts

Corey Cunningham (22)
Faculty Advisor/Collaborator: Ethan Wickman
Composing for Wind Ensemble in the 21st Century

During the last several decades, the wind ensemble has become a significant force supporting the commissioning and performance of newly composed music, in some cases surpassing similar efforts on the part of the symphony orchestra. Our research examines significant works by composers of wind ensemble music of the last 30 years, and strives to establish a set of criteria for works that are successful in terms of their innovative potential and artistic longevity.

Katie Douglass (5)
Faculty Advisor/Collaborator: Ryan Jones
Creating a Popular Music Discography: The Commercial Recordings of Jo Stafford

This project assisted in the ongoing research and preparation of materials related to building a basic discography of recordings made by popular music artist Jo Stafford (b. 1917) during her prolific professional career as a singer. Through collaboration with and guidance from the faculty advisor, the student, Katie Douglass, researched and compiled a thorough and detailed discographical listing pertaining to Stafford's commercial recording period with Capitol Records, among other smaller labels. This database of information (including but not limited to record label, recording date, song title and catalogue number, composer, and relevant ensemble personnel) will ultimately serve a central purpose in a larger monograph documenting and contextualizing Stafford's life and art in American jazz of the last century.
Joseph Kastnerj (34)  
Faculty Advisor/Collaborator: Gary Schwartzhoff  
*Elizabethan Madrigal Dinner, Renaissance Brought To Life*

My project, part of the Blugold Fellowship program, examines a modern interpretation of one of the world's oldest forms of musical performance, the madrigal dinner. Madrigal dinners are performed across the country and across the world to showcase a form of music that has helped shape choral music as we know it and also to entertain audiences in a way that isn't seen as much in recent times. The purpose of this project is to explain the background of the madrigal dinner and show the key elements that any good dinner needs to be successful.

Lani Lutz and Chelsey Dahm (37)  
Faculty Advisor/Collaborator: Toni Poll-Sorensen  
*Martha Graham: Influences on Contemporary Dance and Choreography*

Martha Graham is one of the most celebrated artists in modern dance. This project allowed students and faculty of the Music and Theatre Arts Department the opportunity to study Martha Graham, her technique, and her body of work in depth. This project fulfilled three main goals. The goals were to research Martha Graham as a choreographer and prime mover in modern dance, to research choreographic works of Martha Graham, and to research the technique of Martha Graham. Achieving these three goals laid the groundwork for completion of two ultimate objectives. The first objective was to create a student-choreographed work using the technique of Martha Graham. Second, the researchers developed a technique base utilizing the choreographic elements of the piece to train dancers to perform the work. This work was performed at the Kjer Theatre on March 6, and will be presented at the NCUR Conference in April, 2009.

Angela Nieman and Andrea Fuss (46)  
Faculty Advisor/Collaborator: Mitra Sadeghpour  
*En Travesti: The Operatic Mezzo-Soprano as Leading Man*

In the 17th and 18th centuries, an operatic tradition began that some roles originally intended for male castrato singers were now sung by women. After the disappearance of castrati, these roles were sung entirely by women. Also, gradually during this time period, some composers began to write male roles expressly for female singers. Though the term “mezzo-soprano” (medium soprano) was not used until the end of the 18th century, that classification describes those women’s voices: a strong middle register with both upper and lower extensions and a richer, darker sound than a soprano (similar to the sound and range of the male castrati). This research project explored how the tradition of “pants roles” began and a time line of the major roles of this type was created and compared to mezzo-soprano female roles in the same period. The research team then created a written guide for preparing a "pants role" that includes character study and movement adaptations (how does a man move and how does a woman emulate that physically). The culmination of the project is a lecture recital on April 30th, 2009 in which five student mezzo-sopranos will perform examples of major pants roles.

Angela Nieman and Lauren Tompkins (35)  
Faculty Advisor/Collaborator: Mitra Sadeghpour  
*Mayhem with Mozart*

Each generation of directors, singers, and conductors has approached Mozart's operas from the perspective of the age and culture in which they live. Musical aesthetic, technology, performance venues, musical instruments, and styles of acting and performance have evolved drastically, creating a fascinating musical and cultural record. The research team hypothesized that our 21st century perspective may be colored by subsequent reinterpretations of the operas and that directors and performers would benefit from a re-examination of the original productions and scores. The student researchers and Dr. Mitra Sadeghpour examined scores of Mozart's mature operas, eyewitness accounts of original productions, and primary sources on acting and dramatic styles prevalent in Europe during Mozart's prominent opera
years. The findings were then incorporated into the fall Opera Workshop program, Mayhem with Mozart. This program included two types of scenes: scenes that employed modern interpretations/updated stagings and scenes staged in the style in which they would have been performed in Mozart's time. A survey was designed and administered to the audience of the Opera Workshop performance measuring their preferences and reactions to both the updated and original stagings.

Caleb Price, Mary Webster, Michael Wolter, Carl Schroeder, Aaron Hedenstrom and James Kellerman (6)
Faculty Advisor/Collaborator: Ethan Wickman
The Sounds of Spaces: Composing for the Zeitgeist New Music Ensemble

Six student composers have collaborated with Zeitgeist, an internationally renowned new music chamber group based in St. Paul, MN, to create a series of new compositions inspired by the topic of physical spaces. The collaboration developed through an initial orientation, rehearsal sessions, and a final performance of all the works in March of 2009.

Christiane Stagg (47)
Faculty Advisor/Collaborator: Gary Don
Literal and Symbolic Cyclic Form in Debussy’s Sonata for Flute, Viola, and Harp

In his Sonata for Flute, Viola, and Harp, Claude Debussy presents the listener with a fascinating handling of cyclic form. This skillful manipulation is seen not only in the literal return of the opening musical material, but also extends symbolically into Debussy’s own irretrievable past. As Debussy himself said of the sonata, it is from a “Claude Debussy of long ago,” and dates from a time when he was “still in touch with music.” References to the irretrievable past are extended even further to ancient allusions through his modal manipulation. Possible meaning of his use of the viola, a modern instrument, is considered alongside his use of ancient instruments such as the flute and harp. In exploring the literal application of cyclic form, the cyclic nature of each individual movement is presented and analyzed. The cyclic nature applies not only to the individual movements but also to the piece as a whole. Debussy’s clever manipulation of the opening statement is discussed as it finally returns not as a simple variation or transposition, but as entirely transformed material that functions with a new purpose. Commentary on the technical and interpretive challenges of the performers is also discussed.

Emily Van Winkle (4)
Faculty Advisor/Collaborator: Kevin Gawley
Repertory Light Plots in Professional Theatre

This project was based to create an advanced understanding of lighting design principles and how those principles relate to producing theatre in repertory fashion. The student, Emily Van Winkle, researched opera lighting plots as well as summer stock repertory lighting plots in order to understand the complexities of a true repertory plot. The research collected led to a specific study in the field regarding ten productions. The productions were a part the National High School Institute in Evanston, Illinois in the summer of 2008. Emily assisted faculty mentor, Kevin Gawley, as the assistant lighting designer for those productions by creating a repertory based lighting plot that accommodated each of the ten productions. Following this research, Emily also completed repertory lighting plots for three of the theatres on campus – Kjer Theatre, Riverside Theatre, and Gantner Concert Hall. These lighting plots will benefit students working on the One Act Festivals produced on campus, along with other student work being produced in the future.
Philosophy and Religious Studies

Dean Alley (21)
Faculty Advisor/Collaborator: Steven Fink
The Emergent Church: Self-Identity Construction Through Conversation

Our research looks at a Christian movement called the “Emergent” or “Emerging” Church and the identity they construct of themselves through their books and online writings such as blogs. This movement is largely a post-modern movement; in the spirit of post-modernism the Emergent Church is difficult to define but there are some important factors that each representation of the Emergent Church has in common: their embrace of post-modern ideas, their distrust of hierarchies, a tendency towards spiritualism rather than organized religion, and at the core of our research an important emphasis on “conversation.” Nearly every book, blog and video in our content analysis mentions this concept of “conversation” and how they contribute to the “conversation” or start a new “conversation.” Relative truth is common in post-modern thought and this “conversation” is an extension of that idea that the Emergent Church spends much of their energy on maintaining. Because the body of research on this movement is small, as this movement is new, our research will hopefully be a foundation for future research on the Emergent Church.

Chris Dierich (36)
Faculty Advisor/Collaborator: Kristin Schaupp
A Critique of the Causal Theory of Knowledge

Philosophers want to know what knowledge is and since classical times it has been thought to be justified true belief. This came into question when Edmund Gettier challenged the theory in his paper “Is Justified True Belief Knowledge?” Gettier’s counter-examples relied on our intuitions to show that while justified true belief is necessary for knowledge, it is not sufficient. Epistemologists have since tried to either add a fourth condition to knowledge or reformulate justification in such a way that it is impervious to “Gettier” style problems. One of the strongest responses to Gettier is Alvin Goldman’s causal theory of knowledge. While the causal elements in his original and subsequent proposals do help in responding to Gettier, they are vulnerable to a specific line of attack. Because inductive reasoning plays a crucial role in the formation of knowledge, we will suggest that theories with causal elements are subject to criticism based on the work of Nelson Goodman and his new riddle of induction. Goodman’s riddle pinpoints our inability to distinguish in advance between good inductive statements and those that are absurd. We will show how the difficulty outlined by Goodman is problematic for many attempts to respond to Gettier’s counterexamples.

John Rohde (45)
Faculty Advisor/Collaborator: Kristin Schaupp
Induction and the Problem of Bayesian Conditionalization

Induction, as opposed to deduction, is a form of reasoning with uncertain conclusions. Induction is not a random activity. We seem to follow some principle, method, or rule(s) when using this type of inference. However, these either lack deductive justification or attempt to rely on an inductive justification which is circular. One proposed solution is Bayesian Conditionalization, a form of reasoning where one’s future beliefs depend only on the prior state of one’s knowledge, and not on a rule or principle. This results in a denial of induction as historically defined. My research examines a potential weakness with conditionalization as outlined by Samir Okasha. In his account, imagination and creative insight play a key role. This seems to work only when the correct result is already known or close at hand. I argue that this is problematic and difficult to formalize. Without a procedure that can be used to determine when something should or shouldn’t be used, then conditionalization seems to lack philosophical justification. If so, I argue that conditionalization offers few advantages over previously proposed forms of induction such as falsification, confirmation, or projectability.
**Touger Thao (20)**  
Faculty Advisor/Collaborator: **Scott Lowe**  
*The Essential Aspects of Traditional and Christian Hmong Weddings*

This study, which combines original, IRB-approved interviews and a literature search, describes the “essential” contents of contemporary weddings of Hmong-Americans. Recognizing that preservation, innovation and compromise are all likely when persons of an immigrant minority culture acclimate to mainstream America, this research project contrasts weddings of those who maintain the traditional Hmong religion with those who have converted to Christianity.

**Women’s Studies**

**Dan Newman, Andrew Loftus and Mitch Gustafson (58)**  
Faculty Advisor/Collaborator: **Nicole Schultz**  

We will show that the mainstream film industry is not as progressive as the independent film industry. We will do this by looking at the trends in popular mainstream Gay, Lesbian, Bisexual, and Transgender (GLBT) films. By figuring out the similarities and differences between these mainstream Hollywood films and the independent films that deal with the same situations, we hope to show that the mainstream film industry is not helping the GLBT cause as much as it could. The quantitative evidence we will look at is box office receipts and awards that are given out to these films in both the independent and mainstream cinema circuit. We will work with the GLBT organization on campus and ask them what they think of the mainstream portrayal of these individuals in film and whether or not they think it needs to be fixed and how it can be fixed. We are also going to create an online survey. This way we will have a wide variety of individuals of varying backgrounds that can give us the necessary information we need as to whether or not they believe that mainstream cinema could be more progressive on GLBT issues.
Behavioral and Social Sciences

Communication and Journalism

Elizabeth Amys (119)
Faculty Advisor/Collaborator: Nicole Schultz

*Look Mom I’m All Grown-Up! A Third-wave Feminist Perspective on Work-Life Balance*

This research project addresses two research questions: (1) how do men and women balance work and life? and (2) how are men and women’s approaches to balancing work and life similar or different? To answer these research questions, the current study employs thematic analysis to analyze existing literature as a means of identifying common themes in existing work-life research. The significant theoretical contribution of this work is that themes in the literature about how men and women attempt to balance work and life, and how men and women’s approaches to balancing work and life differ, is that these the themes are critically analyzed through a new lens: a third-wave feminism perspective. Analysis of existing work-life research findings through a third-wave feminist lens garners a new perspective on work-life research that focuses on significant implications regarding work-place satisfaction and work-life balance and offers alternative suggestions and limitations for examining work-life balance issues from a feminist epistemological framework.

Samuel Baisley, Robert Hanson, Glen Mabie, Benjamin Manich and Derek Laughren (120)
Faculty Advisor/Collaborator: Nicole Schultz

*Tuned in to Politics: A Correlation Between Music Preference and Political Affiliation*

Our research is designed to determine if there is a correlation between the kind of music people listen to and their political affiliation. The question our research asks is: “Is there any correlation between college students’ preferred genre of music and their political affiliation?” Our research utilized a nominal scale for both our independent variable, preferred music genre, and our independent variable, political affiliation. Both variables can be measured using a nominal scale, as they are non-numeric categories that are not ranked or ordered. Utilizing UW-Eau Claire’s Web Survey software, our research group created our research questions and sent them via e-mail to students attending UW-Eau Claire. We used Web Survey software to analyze the results we received via Chronbach’s Alpha Coefficient to examine the relationship among the answers. This analysis breaks down music genre and political affiliation preferences by age groups, and determines if there is a correlation between the music a person listens to and their political affiliation.

Brianna Covington, Brittany Carter, Andrew Arends, Cory Shay, Angie Jones, Loni Olstad, Kristi Halvorson, Sara Pertz and Danielle Gannon (224)
Faculty Advisor/Collaborator: Nicole Schultz

*Environ-MENTAL: The Conscious Decision to Impact the Community*

The purpose of this research is to reduce paper usage amongst faculty at University of Wisconsin-Eau Claire (UWEC) in order to reduce UWEC’s ecological footprint. The project begins with the development and facilitation of a paper-saving competition among UWEC departments to promote reduction of paper usage. The meaningful research component and contribution of this project lies in the data collected and analyzed regarding what compels faculty to minimize their use of paper. Qualitative data regarding why faculty opted to participate in the paper-saving competition and what, if anything, effectively motivates them to strive to minimize paper usage is collected via unstructured interviews and analyzed via thematic analysis to identify common themes amongst faculty responses. The project culminates in a critical discussion about the challenges, limitations, and benefits associated with paperless faculty instruction.
Brianna Covington, Allison Proite and Heidi Hanson (241)
Faculty Advisor/Collaborator: Nicole Schultz
Opening Up the Eau Claire Community: An Investigation into the Experiences of Members of the Lesbian, Gay, Bisexual, and Transgender Community on the University of Wisconsin - Eau Claire Campus and in the Eau Claire Community

This project investigates experiences of members of the Lesbian, Gay, Bisexual, and Transgender community on the University of Wisconsin – Eau Claire campus, as well as in the Eau Claire community. In order to gain knowledge of these experiences, a series of recorded interviews was conducted with various members of the Lesbian, Gay Bisexual, and Transgender community. These interviews include questions about coming out and the adversities that the interviewees face on an everyday basis on the University of Wisconsin – Eau Claire campus and in the Eau Claire community. These interviews were analyzed through thematic analysis, to determine patterns among the experiences of the interviewees. A video was compiled of significant clips from the interviews to act as a supplemental piece. The video highlights and illustrates the common patterns found throughout the interviews.

Jamie Daley, Amanda Ehlers and Anne Moser (193)
Faculty Advisor/Collaborator: Martha Fay
The Implications of Communicator Style of Listeners and the Perceived Credibility of Corporate Accented Spokespersons

Due to the significant increase in the necessity for corporate apology speeches in recent years, this study examined corporate impression formation management and listener communication style to ascertain how these are related. The focus of this research was on perceived credibility of spokespersons with regional and non-regional accents. Research suggests that the most effective corporate apologies acknowledge the corporation’s responsibility to affected parties and offer means of amends (Cohen, 1996). Research on accent also suggests that there is a relationship between corporate spokesperson credibility and accent (Tsaklis, Ortiz-Buonafina, & LaTour, 1992), whereas credibility ratings are higher when audience and spokesperson share the same accent. The concept of credibility has been examined in multiple areas. However, there is no evidence to date that credibility has been examined in the context of apology speeches by organizational spokespersons with accents, nor has listener communication style been examined with regard to credibility perceptions. Using Norton’s (1978) Communicator Style Measure and a Modified Matched Guise Technique (Tsaklis, Ortiz-Buonafina, & LaTour, 1992), this study surveyed 200 undergraduates at a midwestern university. Apologies that were delivered in a midwestern accent were judged most credible and perceived credibility was related to specific communication styles of listeners.

Stephanie Falch, Raechel Heffernon, Kristin Hartman, Ashley Nelson and Chris Miller (121)
Faculty Advisor/Collaborator: Nicole Schultz
“Drip, Drip, Drip: How You Can Save Lives With Just One Trip!!” The Importance of Blood Donation to Increase Blood Supply and Knowledge of Blood Donation

The purposes of this project are two-fold: 1) increase awareness of blood donation among University of Wisconsin-Eau Claire students and 2) strategic message development including techniques intended for encouraging students to donate blood. The applied research question addressed the concern: “What measures should be taken to increase blood supply associated with students?” Online surveys were conducted to increase awareness along with phone interviews through the American Red Cross in order to solicit more donations from students. For the online surveys, we asked questions concerning past donation habits, overall knowledge of blood donation, and future plans to contribute. The web survey data was used to exemplify accumulation of blood donation importance, eligibility, and knowledge. Posters were distributed around campus, along with advertisements in classrooms, and table handouts in places of high student traffic. A percent difference was measured between the previous year’s blood drive and the spring of 2009 drive. The study increased awareness of blood donation as well as donor turnout in a blood drive within the surrounding area.
Are You Afraid of the Dark?: Student Safety On and Off The UW-Eau Claire Campus

The purpose of this research project is to explore and reveal unique individual safety techniques for securing personal safety amongst University of Wisconsin–Eau Claire (UWEC) student who reside both on- and off-campus. Data regarding what UWEC residential advisors and campus police believe are the most important safety precautions for UWEC students to take to secure personal safety on campus is collected via semi-structured interviews. Similarly, data regarding what Eau Claire community landlords and public transportation providers believe are the best safety precautions for UWEC tenants to take to secure personal safety off-campus is collected via semi-structured interviews. Interview data is analyzed via thematic analysis to identify the most prevalent safety tips, techniques, and practices recommended for on- and off-campus students. Themes identified via thematic analysis of interview data are then used to develop safety recommendations for UWEC students who reside on- and off-campus.

Life of a Child

The purpose of this research is twofold: (1) to explore reasons why University of Wisconsin-Eau Claire (UWEC) college students do not volunteer to serve as a mentor with Big Brothers Big Sisters of Northwestern Wisconsin (BBBSNW) and (2) to develop persuasive marketing campaign materials challenging reasons why UWEC college students do not volunteer for BBBSNW. Data regarding why UWEC students do not volunteer is collected via unstructured interviews and interview data is analyzed via thematic analysis to identify primary reasons students do not volunteer. The themes identified in the thematic analysis of interview data are then used to develop persuasive marketing campaign materials that challenge excuses for not volunteering by offering information about volunteering, correcting misperceptions about volunteering, and highlighting reasons and rewards for volunteering.

Humor and YouTube: Do Perceived Realism and Homophily Change What is Funny?

Created in 2005, YouTube has become the most successful video streaming site on the Internet, and the fourth most visited site in general (Cheng, Dale, & Liu, 2007). Because it is universally available, reaches millions of people, and is uncontrolled, YouTube may be a powerful persuasive force in society. Yet, little is known about its effects. Drawing on research on other media in the areas of homophily and perceived realism, this study examines perceptions of disparagement humor as shown on YouTube. Research on homophily in television shows a positive link between aggression of undergraduates and the identification with aggressive characters they saw on television (Eyal and Rubin, 2003). Research on perceived realism and television also shows that people who perceive television content as more real are more likely to be influenced by it (Busselle & Greenberg, 2000). Based on these results, this study seeks to explore the relationship between homophily, perceived realism, and viewers’ judgments of humor quality in YouTube videos. Students from a midwestern university completed an online survey and responded to questions after watching a disparaging video on YouTube. It is anticipated that perceived realism and perceived homophily will negatively affect the viewer’s assessment of the video’s humor.

Eau Claire College Students’ Perceptions of Feminism

The present study was interested in determining how students from the University of Wisconsin-Eau Claire (UWEC) perceive feminism. The researchers conducted structured, face to face interviews around
the Eau Claire campus with a small sample of college students. The college students were asked a series of general questions regarding their definitions of feminism and their opinions regarding feminist ideas. Verbal responses from participants were transcribed into visual data that could be analyzed. Data was analyzed by identifying all related responses and divided the responses into categories and sub-categories based upon the frameworks of feminism defined by Lorber in Gender Inequality. The results of the present study provide a general understanding of how a small sample of UWEC students perceive feminism. Based upon the general perceptions, the researchers offered advice as to how students can become more informed about feminist ideas and how the university in partnership with the Women's Studies Department can disseminate information regarding feminist ideas.

Andrea Keister, Cameron Cylkowski, Ashley Smith, Aaron Miller, Charlene Lucht, Terri-Lynn Introwitz, Melissa Smith, Zack Hayes and Allyson Hedding (128)

Faculty Advisor/Collaborator: Nicole Schultz

The Price is Right: The Importance of Controlling the Pet Population

The purpose of this research is twofold: (1) develop marketing campaign messages/materials and donation-request practices for the Eau Claire County Humane Association Spay/Neuter Voucher Program that are grounded in persuasive pathos-based (emotional) appeals, and (2) analyze the effectiveness of these messages. This applied research project employs thematic analysis to examine successful Humane Society donation campaign messages. Themes that emerge from analysis of successful campaign messages are used to construct emotionally-persuasive messages for campaign materials for the Voucher Program. Qualitative data regarding effectiveness of these pathos-based appeals and donation-request practices of the Voucher Program campaign materials is collected via unstructured interviews with community members and business owners asked to donate. This project culminates in a critical discussion about analysis results of the data and implications for donation campaigns and employing effective emotion-based persuasive appeals and donation-request practices.

Amy Knight, Melissa Ternes and Brenna Hall (143)

Faculty Advisor/Collaborator: Nicole Schultz

Effective Leadership Styles in Second-Grade Classrooms

The objective of this project is identifying whether or not there are different leadership styles between men and women in the classroom; specifically, second grade. This project explores the ways both sexes interact with the students in their classrooms. The purpose of this project is to conclude which leadership style is the most effective for each sex. By sitting in the classrooms of six different teachers in the Eau Claire area, and writing notes, the data that was collected determined the effective leadership styles between the sexes, as well as the reactions of the students to those styles. The cause and effect analysis, which demonstrates how the occurrence of one event correlates with a particular outcome, is the analysis used for this project. The results of this project assert the most effective style of leadership, based on sex, to be enacted in the classroom.

Pierce Koch, Anne Moser, Nessa Severson and Joseph Tierney (278)

Faculty Advisor/Collaborator: Judy Sims

Culture Talk: The Influence of Culture on Communication

Communication is a behavior affected by culture. What one is taught affects the values one maintains and how one behaves. The purpose of this research, which explores the influence of culture on communication, is to encourage understanding of how culture affects the messages one delivers and how one communicates. This study investigates how cultural values affect communication behaviors, as well as how culture influences verbal communication behaviors, nonverbal communication behaviors, and the use of interruptions. Data were gathered through interviews and observation from a sample (N=24) of international students and scholars, immigrants, and American Indians. Results, for example, suggest: (1) it is important in many cultures to use certain forms or titles to show respect, (2) some cultures communicate more indirectly than do U.S. Americans, yet some more directly, (3) many interviewees
experience shock about how to respond in the U.S. to the question, “How are you?” (4) differences exist among cultures concerning who may touch whom, how much, and in what context, (5) the appropriate use of eye contact is important, (6) a number of gestures used in some cultures are not used in the U.S., and (7) interruptions are most common between same gendered individuals.

Jacqueline Kress, Kristin Hartman, Leah Akervik and Anna Riedel (169)
Faculty Advisor/Collaborator: Nicole Schultz
Women's Studies: Perpetuating Oppression?

The objective of this project is to research if today’s media represents women as negatively as Women’s Studies courses often depict. This research project aims to determine if women are as victimized in the media as Women’s Studies courses are teaching in the classroom. The research question that this project was inspired by is: Do college students think that women in today’s media are as victimized as Women’s Studies courses portray them to be? This project employed electronic survey as a method of data collection amongst students at University of Wisconsin-Eau Claire (UWEC). The web-based survey questioned both males and females to gain data on students’ perceptions of the content that is being taught in Women’s Studies classrooms. Quantitative statistical methods were employed to analyze the data. We hypothesized that the students surveyed would not agree with the information presented and opinions perpetuated by Women’s Studies courses, which results in UWEC students avoiding enrolling in Women’s Studies courses because of the language used in the curriculum and the classroom.

Jacqueline Kress, Meghan Rohe, Sarah Moran, Samantha Howard, Hannah Tripp, Breann Schossow, Kristopher Bergstrom and Mandy Narverud (152)
Faculty Advisor/Collaborator: Nicole Schultz

The overall objective of this study is to examine the communication differences between sexes. This research project aims to distinguish the differences between how males and females perceive nonverbal communication as flirtatious. This study investigates the manner in which a given subject (either male or female with heterosexual orientation) perceives an act of nonverbal communication from the opposite sex. Subjects participate in an online survey that depicts hypothetical, everyday scenarios in which a male and female interact nonverbally (i.e., physical touch, facial expressions, eye-contact, and gestures). Subjects then rate each situation on varying degrees of flirtation, ranging from not-at-all flirtatious to extremely flirtatious. By examining the subject’s perception of a particular action, this project intends to prove the significant relationship between a person's sex and his/her perception of nonverbal communication as flirtatious. Data is analyzed via Cronbach’s Alpha Coefficient to assess reliability of measurement, and Cross Tabulations and Chi-Square Test of Independence to determine whether a significant relationship exists between x and x. (Note: x = variables).

Jessica R. LaVigne and Eun-Sil Lee (248)
Faculty Advisor/Collaborator: Won Yong Jang
A Comparative Analysis of Freedom of Speech and Public Access Law

This study examines whether a global culture exists and whether this global culture influences national or regional cultures, or vice versa, by analyzing ‘freedom of speech’ and ‘freedom of information’ laws in the emerging global community. More specifically, this study explores the constitutional texts of national states in order to find out whether or not certain specific provisions are similar, and if so to what extent. If similarities are found in this analysis, it will be argued that there exists a global political culture. It can be said that the more that similarities exist among countries, the more globalization is taking place. If no similarities are found, one can say clearly that different political and cultural backgrounds lead to these results. This study suggests that globalization’s cultural procedure does not necessarily mean cultural homogenization, in general and specifically, tradition within specific countries is consistent with the recognition of freedom of speech and information.
Erin Liffrig, Mallory Markham and Amanda Hornick (144)
Faculty Advisor/Collaborator: Nicole Schultz
Who Wears the Pants? Decision-Making Dynamics in Diverse Couples

The aim of this project is to better understand differences and similarities in decision-making dynamics among different types of romantic couples. How choices are made by diverse college couples is examined. It’s expected that the couples studied play into gender roles, and decisions are more often made by the masculine partner. The pairs interviewed are from different sexual orientations and of various races. Couples answer a list of questions focused on common decisions. Some topics covered include financial, social, and emotional disputes. The data collected is qualitative and compared in context. The results of this study represent whether or not the idea that gender roles are prevalent in many forms of relationships is true.

Nicole Lillis, Kellie Lund, Pang Kou Khang, Madeline Duffy and Jenna France (194)
Faculty Advisor/Collaborator: Martha Fay
Frequency of Gossip During Times of Organizational Change

Research suggests that uncertainty increases when environments are characterized by high levels of fluctuation (Tourish, 2004). Uncertainty reduction theory (Berger & Calabrese, 1975) predicts that people will engage in information-seeking behaviors in an effort to reduce uncertainty. One communication behavior often used to gain information is gossiping, yet this motive for gossip during organizational change has not been systematically examined. This study explores possible associations between frequency and motives for the particular form of informal communication referred to as gossip and level of experienced change in organizations during the previous six-month period. Because propensity to gossip is predicated on trust for one’s partner (Kramer, 1999), this study also examines the moderating role of trust on the relationship between frequency of gossip and the information-seeking motive. Finally, since satisfaction with communication is linked with higher job satisfaction and organizational commitment, this study examines the relationship between frequency of gossip and these important outcomes. An electronic questionnaire was distributed via web survey to community members and extended networks. Results indicated that gossip increased during times of organizational change. Further, communication satisfaction was associated with gossip frequency and information-seeking motive, and also with job satisfaction and commitment.

Molly McHugh and Nikole Bryson (145)
Faculty Advisor/Collaborator: Nicole Schultz
Pornography and its Effect on Relationships

This research evaluates the extent to which pornography has an effect on heterosexual relationships. This project examines male and female perceptions of pornography and how it shapes and influences the strength of a person’s relationship with his/her significant other. The researchers believe that the incorporation of pornography into one’s intimate relationship in excessive amounts can have a negative effect on the closeness and affection between the two people involved. In order to gain insight on this issue, peer-reviewed journal articles are utilized as an aid in supporting the proposition. A survey is also administered to both men and women to view how pornography affects the relationships he/she is currently in or has been in. As a result, it can be concluded that there is a link between pornography and its effect on relationships.

Samantha Michaelson and Caitlin Anderson (167)
Faculty Advisor/Collaborator: Nicole Schultz,
Gender Bias in the Mass Media: Evaluating Rebellion Feminisms, Political Correctness and “The Other”

The purpose of this study is to examine University of Wisconsin-Eau Claire (UWEC) students’ perceptions of advertising through a gender rebellion feminism lens, which focuses on how men and women in the mass media are viewed differently within American society. To execute the project, 50 UWEC students (25 men and 25 women) completed questionnaires which asked for personal reactions to various media.
Questionnaires included advertisements, quotations, and taglines. The questionnaires consisted of 10 photos and quotations from television and magazines. Respondents were asked for an immediate, uncensored reaction to the photo or quotation. Responses were compiled and separated according to three main categories: (1) response to the medium presented (positive, negative, or neutral), (2) type of gender rebellion feminism with which response most closely aligned (multicultural/multiracial, social construction, or postmodern), and (3) whether the response portrayed the respondent as feeling “othered”/marginalized. This research project culminates in a discussion about mediated messages and implications of political correctness.

Amanda Moe (154)  
Faculty Advisor/Collaborator: Nicole Schultz  
*Consumerism, Gender, and the Environment: How Consumerism is Targeted at Women and the Effect it has on the Environment*

The Women and Gender Equity (WAGE) Center at the University of Wisconsin-Eau Claire (UWEC) has coordinated an event called Swap-O-Rama to implement awareness for alternatives to consumerism. WAGE has undertaken this initiative as a result of consumerism leading to negative impacts on the environment and unrealistic expectations for and perceptions of women, particularly in the clothing industry. This research project uses a critical ecofeminist framework to examine ways in which women consumers are targeted by advertisements. Themes that emerge from analysis of advertisements targeted to women through the ecofeminist lens are used to construct effective messages to present awareness about consumerism and its potentially negative consequences for women. This research culminates in the development of advertising and marketing messages and materials for the UWEC WAGE Swap-O-Rama event developed from the ecofeminist thematic analysis.

Jordan Mueller, Stephanie Schiefelbein, Jessica Swenson, Jane Wilson, Josh Parsons and Anna Larson (168)  
Faculty Advisor/Collaborator: Nicole Schultz  
*The Trifecta Effect: Three Aspects of Healthy Living*

The purpose of this study is to analyze three aspects of health among first-year students at University of Wisconsin-Eau Claire (UWEC): (1) stress management, (2) nutrition, and (3) fitness. Specifically, this project examines ways in which stress management, nutrition, and fitness can be analyzed as interdependent aspects of health to reveal and improve the overall health and wellness of first-year students at UWEC. Quantitative data regarding first-year UWEC student stress management, nutrition, and fitness habits are collected via survey research and analyzed to reveal the practices that contribute to and/or hinder overall health and wellness. Results are analyzed to show correlations between stress management, nutrition, and fitness as the three aspects of a healthy lifestyle. This research culminates in suggestions for first-year students to improve their stress management, nutrition, and fitness practices by using local UWEC and Eau Claire transportation, resources, and businesses.

Mandy Narverud (175)  
Faculty Advisor/Collaborator: Mary Hoffman  
*Communication and Work/Life Balance for Young Professionals*

The objective of this qualitative study is to examine communication about work/life balance. We look specifically at how young professionals view work/life balance, as well as when and who they communicate with about the topic. This study asks subjects to comment on everyday experiences dealing with discussion or the absence of discussion of non-work life in the workplace. In examining the respondents’ answers, we will identify how young professionals view communication about work life balance in the workplace. We use an online survey in which the volunteer participants are presented with questions prompting them to further discuss their perception of communication of work life balance. We will use a thematic analysis to identify ideas that occur with frequency and intensity in the data. This poster will summarize the existing literature on work/life balance, our research methodology, and preliminary findings and conclusions.
**Advertisement and Education of Plan B in Correlation to Pro-Life/Pro-Choice Opinions of Abortion**

The objective of this research is to determine exposure and knowledge of Plan B birth control among University of Wisconsin-Eau Claire (UWEC) students. Plan B is a form of emergency contraception which is approved by the Food and Drug Administration for preventing pregnancy after unprotected intercourse. Survey methods are used to collect data regarding personal birth control methods, knowledge and opinion of Plan B emergency contraception in correlation with pro-life/pro-choice standpoints on abortion. Advertising methods targeted to our sample are analyzed to determine their effect. Data is analyzed to establish associations between education of Plan B and its advertisement exposure. We hypothesize that there will be a strong correlation between lack of education regarding Plan B and pro-life views.

**Communicating Stress**

The purpose of this study is to explore the significance of sex as a factor in the likelihood of an individual to communicate stress. The specific hypothesis tested is: women are more likely than men to communicate stress. The sampling frame for this study consists of University of Wisconsin-Eau Claire students ranging in age from 18-26. Quantitative self-reported data about people’s stress-communicating habits is collected via an electronic survey link emailed to potential respondents. Quantitative statistical methods are used, including Cronbach’s Alpha Coefficient to assess internal reliability and cross tabulations and Chi-Square Test of Independence to assess whether a significant relationship exists between the sex and likelihood of communication stress.

**Supervisor-Subordinate Friendships: The Effects of Promotion on Peer Relationships**

Research shows that workplace friendships are linked with higher job satisfaction, organizational commitment, and job performance (Sias, 2005). While friendships can and do form between people at different levels of authority (Boyd and Taylor, 1998), their relationships are often strained when the power difference becomes salient (Sias, 2004). This study focuses on the different communication tactics used to negotiate the supervisor-subordinate friendship, specifically when the supervisor was once the subordinate’s peer prior to a promotion. Respondents who had experienced a shift from the dynamics of workplace friendship to that of a supervisor-subordinate relationship were surveyed to explore specific communication tactics used to negotiate the change in roles.

**Exposing Slavery: Sex Trafficking Awareness**

The purpose of this research is to raise awareness amongst University of Wisconsin-Eau Claire (UWEC) students about slavery in the form of sex trafficking in the United States. This research project consists of two phases: (1) analyzing scholarly and current-event literature to identify themes about the status of sex trafficking in the U.S., and (2) developing, pilot-testing, and revising a peer-education program for UWEC students. To complete the first phase of the project, the current study employs thematic analysis to analyze existing scholarly and current-event literature as a means of identifying common themes about the status of sex trafficking in the U.S. These themes are then used to develop an active-learning based lesson plan for the UWEC Peer Diversity Educators (PDE) Program to be facilitated by students in UWEC classrooms. The sex trafficking PDE program is pilot tested with a group of UWEC students and
qualitative data regarding program effectiveness is collected, analyzed, and used to make revisions to the final version of the sex trafficking PDE program.

Kelly Slowinski, Bryan Trzebiatowski, Tammy Michels and Darrik Erikstrup (218)
Faculty Advisor/Collaborator: Martha Fay
The Effect of Organization Recruitment Tactics on Entry Level Applicants: Are they Appealing to the Right Audience?

Research on Person-Organization Fit has shown that when company values are congruent with employee values, employees will likely perform better, stay longer, and report higher job satisfaction and commitment to their organizations (Morely, 2007). Given such outcomes, organizations work to craft recruitment messages that attract the best-fitting candidates. A number of strategies for developing such recruitment messages have been studied, but these have focused on realism of the job preview, message specificity (Roberson & Collins, 2005), and corporate representations of the meaning of work (Young & Foot, 2006). Research on candidates’ decision processes and communication styles as they relate to recruitment messages has not been conducted. Research on decision-making has shown that some people interpret messages by looking more closely at the meaning and drawing connections between meaning and personal experiences or beliefs (Petty & Cacioppo, 1986). This study examines Person-Organization Fit based on an understudied population—soon-to-be college graduates. We are testing whether candidate communication style and decision process (high or low thought) relate to messages intended to attract the best candidates through highly specific recruitment messages focusing on clear opportunities for long term career progression and a pure meritocracy (Terjesen, Vinnicombe & Freeman, 2007).

Morgan Sprattler, Daniel Swedien, Matthew Biren, Michael Vandertie, Amanda Collins and Heather Jacobson (217)
Faculty Advisor/Collaborator: Nicole Schultz
Electronic Waste Reduction in the Chippewa Valley

The purpose of this research is to examine ways in which the Eau Claire community can preserve the environment through electronic waste management. This applied research project employs thematic analysis to examine successful recycling and electronic waste management campaign messages. Themes that emerge from analysis of campaign messages are used to construct effective messages for campaign materials for the Bolton Refuge House cell phone recycling program, improve recycling of Eau Claire community members, and help reduce the amount of electronic waste going into Chippewa Valley landfills.

David Taintor, Stefani Tauger, Kathy Staats, Briana Gruenewald, Lizzie Resch, Cory Bhend, Ryan Thibodeau and Nicole Michaels (153)
Faculty Advisor/Collaborator: Nicole Schultz
Young Adults’ Use of Social Networking Sites and its Effect on Social Interactions and Invitations

The number of ways to communicate with others has grown exponentially in recent years with the introduction of several new technologies. One of the most popular new methods of communication is the online social networking site. Many studies have been done showing how the use of these sites affects various other communication methods. The study focuses on the effect social networking site use has on one’s social life. It examines a non-causal relationship between social networking site use and social events one is invited to. With social networking sites offering a quick and easy way to invite people to social events, we hypothesize that there is a significant positive relationship between time spent using social networking sites and invitations to social events. An e-mail survey with questions related to social networking site use and social interaction created with Web Survey was sent to 15-25 year old students in the Chippewa Valley area. The sampling method employed is non-random and purposive. The data is
analyzed with statistics tests including Chronbach’s Alpha Coefficient and Pearson Correlation Coefficient to determine if there is a positive relationship between the variables.

**Matt Teuteburg, Drew Lukes, Katie Kolosso and Katie Brandt (201)**  
*Faculty Advisor/Collaborator: Martha Fay*  
*Church Online: The Emerging Trends of Virtual Church*

In the year 2010, as many as 50 million people may rely solely upon the Internet to provide all of their faith-based experiences (Einstein, 2008). Despite this recent interest in online religious communities, there have been no in-depth studies conducted on why a person would prefer a virtual church over a traditional “brick and mortar” church and which services someone might choose to use via the Internet vs. a physical church. Research has shown that people attend a physical church for a connection with God, interaction with others, and a sense of renewal (Wolff, 1999). However, little is known about what factors motivate people to use online spiritual resources. This study looks at the interest level in, and motivations for exploring, the emerging trend of virtual church. Using a web survey, students responded to questions about their religious intentionality and Internet affinity and about their willingness to engage in a virtual church as either a supplement to or substitute for attending a physical church.

**Ashley Yakesh, Vicki Fischer, Jennifer Cram and Kelli Kewin (192)**  
*Faculty Advisor/Collaborator: Martha Fay*  
*Measuring Giving Patterns: Do Non-Profit Organizations’ Persuasive Methods Correlate with Family Communication Patterns Regarding Donor Behavior?*

Today’s current economy has left charitable organizations with plummeting giving statistics. As a result, non-profit organizations are re-evaluating the persuasive messages used to influence donor behavior. Individual differences have been shown to account for varying reactions to messages that promote personal involvement and that show normative behavior (Nolan, Schultz, Cialdini, Goldstein and Griskevicius, 2008). Research also indicates that persuasive messages that reflect an organization’s focus on giving donors a voice and that reflect an organization’s tradition also affect donor behavior (Sargeant, Ford and Hudson, 2008). Using Family Communication Patterns (Ritchie and Fitzpatrick, 1990), this study examines the role that an individual’s socialization via family communication plays in his/her persuasibility with regard to the message type (personal involvement, normative behavior) and organizational focus (voice, tradition). College students participated in a web survey asking about their family’s communication practices, and responded to two types of persuasive messages (personal involvement and normative behavior) with regard to the two types of organizational focus (voice and tradition). Results show that family communication patterns do influence the response to particular message types and to organizational foci. Charitable organizations can apply this knowledge to create more persuasive messages targeted to donors based on family communication.

**Counseling Services and Psychology**

**Sara Clark, Hannah Walsh, Josh Kowaleski and Randy Kins (243)**  
*Faculty Advisor/Collaborator: P.J. Kennedy and Allen Keniston*  
*The Incidence Rate of Suicide Attempts and Ideation at UW-Eau Claire*

Suicide and its consequences are a serious concern on college campuses. A national study found that 9.3 % of college students reported attempting suicide (American College Health Association, 2007). There has been no measure of the extent to which suicidal behavior is a concern for UWEC students. This project surveys a random sample of 2,000 UWEC students using the Beck suicide ideation scale, a likert-scale inventory of suicide attempts, the Zung depression scale, demographic measures, and the college alcohol inventory to assess the incidence rate of suicidal behavior on our campus and pertinent correlates. The results of this study are intended to assist UWEC counseling services in focusing suicide prevention efforts.
An online survey assessed the prevalence of eating disorders and their correlates at UWEC. Previous work on eating disorder prevalence in national samples has established that they are more common in college-aged samples than in any other age group. Our Web Survey determined the prevalence of eating disorders at UWEC and the extent to which eating patterns symptomatic of eating disorders correlate with the Big Five personality traits, symptoms of depression, and level of self-esteem, all three being factors known to be associated with eating disorders. Individuals with depressive symptoms and low self-esteem have been shown to have an increased risk of developing disordered eating behavior. Preliminary results show that the prevalence of individuals diagnosed with eating disorders at UWEC is similar to that found in national samples. We expect also to find that symptoms of disordered eating will be positively correlated with openness and neuroticism, higher levels of depression, and low self-esteem.

Economics

**Erik Amend** and **Thomas Michels** (102)  
Faculty Advisor/Collaborator: **Eric Jamelske**  
*An Examination of Housing Prices, Mortgage Foreclosures and New Residential Building Permits in the US, Wisconsin, and the Chippewa Valley*

Nearly all Americans have been impacted by the recent economic crisis. Perhaps the most far-reaching effects of this economic downturn have been associated with the housing market as well as the building and construction industries. Mortgage foreclosures have risen dramatically, housing prices have plummeted, home sales are stagnant, and new home construction has stalled. Our research poster will track recent developments in each of these areas and compare the impact of this recession to other periods of economic turmoil in the US. In addition, we will examine the regional and local effects of the current recession in Wisconsin and the Chippewa Valley. All data will be presented graphically as well as described and analyzed in text.

**Michael Babl** (76)  
Faculty Advisor/Collaborator: **Sanjukta Chaudhuri**  
*Regional Wage Trends in the Midwest Compared to the Nation*

Using the Oaxaca Decomposition to control for educational attainment and selecting specific occupations to control for occupational segregation, the research was focused on regional wage trends in the midwest compared to the national average in three separate occupations. The occupations include both scalable and non-scalable wage rates, and range from female- to male-dominated occupations. The primary questions I will hope to answer are: How does the midwest compare to the nation in each of the occupations? How does scalability affect the gender wage gap? How does the gender distribution affect the wage gap?

**Blake Barnes** and **Ross Hewitt** (101)  
Faculty Advisor/Collaborator: **Eric Jamelske**  
*Comparing Employment Effects Across Recessionary Periods For The US, Wisconsin, And The Chippewa Valley: The Late 2000s vs. The Early 1980s*

Nearly all Americans have been impacted by the recent economic crisis. This includes substantial job losses resulting in rising unemployment. The most recent data shows a loss of over 650,000 jobs for the nation with the unemployment rate rising to 8.1%. Given the severity of the current situation, many experts have begun to compare this recession to past economic downturns. Although it may be too early to suggest that we are headed toward another Great Depression, comparisons with the recession of the
early 1980s could be very meaningful. Our research poster will examine the current employment and unemployment trends for the US, Wisconsin and the Chippewa Valley. We will then provide a detailed comparison of these trends to the employment and unemployment figures from the early 1980s recession. This analysis will pay particular attention to which sectors of the economy were most affected in each period. All data will be presented graphically as well as described and analyzed in text.

Isaac Borofka-Webb, Jared Farmer, Jared Koerten, Bryan Reinhold and Anne Werner (123)
Faculty Advisor/Collaborator: Eric Jamelske
Western Wisconsin Local Foods Project: A Survey of Household Local Food Purchasing in the Chippewa Valley

In Western Wisconsin there is a strong push to develop a more robust local/regional food system, for economic development as well as for environmental and health reasons. Chippewa Valley Center for Economic Research and Development has begun to investigate the demand side of the market by conducting several surveys of local food purchasing behavior. One of our current surveys focuses on household behavior asking families about how much and what kinds of foods they purchase locally as well as where they buy foods locally. In addition, we ask about the actual and perceived benefits and limitations of purchasing local food products. Our research poster will present the results of this survey using graphs and text to analyze the data. One key result is that income does not appear to be a determining factor in the percent of household food purchases that are local, but low income households are more sensitive to price. In addition, a significant majority of households reported that their regular grocery store did not make it easy to purchase local products and therefore the majority of local food purchases were made at farmers’ markets.

Isaac Borofka-Webb, Jared Farmer, Jared Koerten, Bryan Reinhold and Anne Werner (124)
Faculty Advisor/Collaborator: Eric Jamelske
Western Wisconsin Local Foods Project: A Survey of Restaurant Local Food Purchasing in the Chippewa Valley

In Western Wisconsin there is a strong push to develop a more robust local/regional food system, for economic development as well as for environmental and health reasons. The Chippewa Valley Center for Economic Research and Development has begun to investigate the demand side of the market by conducting several surveys of local food purchasing behavior. One of our current surveys focuses on the dining industry by asking restaurants about how much and what kinds of foods they purchase locally as well as where they buy foods locally. In addition, we ask about the actual and perceived benefits and limitations of purchasing local food products. Our research poster will present the results of this survey using graphs and text to analyze the data. Our survey is currently in progress and therefore we do not have any preliminary results to report at this time. We do expect to have approximately 30 Eau Claire restaurants in our sample and will report our results comparing the local food purchasing patterns across various restaurant types such as fine dining, family restaurant, bar and grille and café.

Alex Brueggen, David Hennick, Ryan Tessmer, Alex Trow and Ben Ziemann (125)
Faculty Advisor/Collaborator: Eric Jamelske
The Eau Claire Investment Basket: An Analysis of Local Stock Performance 2005-2008

2008 was a tough year for investors with all of the major stock indexes losing 30-40% for the year. Although the financial crisis hit in late September, many stocks began their fall in July. How was 2008 different for the stock market from other recent years? Were there any stocks that came out winners during these tough times? The Chippewa Valley Center for Economic Research and Development has been tracking general market trends since 2005. In particular, we have been highlighting the performance of locally based stocks compared to the overall market. Our research poster examines the stock market in 2008 and compares this tough year to other recent years. We look at 51 stocks with a local employment presence in the area to see how these companies fared in 2008 as compared to the overall market trends. In addition, many people are wondering when the market will turn around. There is a saying, “so goes January, so goes the year. We will present data on January and the first quarter of 2009 to shed
some light on whether the investment world has turned the corner to recovery. All data will be presented graphically as well as described and analyzed in text.

Robyn Fennig and Drew Bowlsby (53)
Faculty Advisor/Collaborator: Sanjukta Chaudhuri
The Economics of Drinking: Evidence from the UW-Eau Claire Campus

The aim of this project is to find evidence of economic factors that impact underage drinking by administering a questionnaire survey of lifestyle habits amongst students at UW-Eau Claire. The research project explores the following questions: (1) Incidence and consumption levels of alcohol, (2) Price elasticity of demand for alcohol (i.e. the sensitivity of consumption to price) and its policy implication, (3) Impact of campus atmosphere and parental background and (4) brand loyalty. This study is unique for two reasons: First, by including campus atmosphere and parental background, we will add a new dimension in understanding the reasons for high incidence of underage alcohol consumption in Wisconsin. Second, we are adding policy implications to existing studies by tracking price sensitivity.

Amanda Funk (77)
Faculty Advisor/Collaborator: Sanjukta Chaudhuri
Economic Growth and Women's Status

The economic and social progress of women is one of the most important dimensions in a country’s economic growth. While women across the world have achieved unprecedented advancement in economic participation in the past century, gender equality in economic, social, and domestic spheres has eluded many developing nations. Feminist economists consider female labor force participation as one of the most important indicators of women’s economic status and empowerment. Status of women, however, is not limited to labor force outcomes only. Funk and Chaudhuri focus on a broader range of variables under the following headings: (1) mortality and survival (2) human capital (3) marriage and fertility, and (4) domestic empowerment to answer the question: does economic growth over time reduce gender inequality and alter gender perceptions? They perform a cross-country study, covering 36 countries of Asia and Africa at different stages of growth, from 1987 to 2005-2006 by using the following two datasets: (1) The Penn World Table (for measures of economic growth) and (2) The Demographic Health Survey (DHS) (for measures of women’s status). Results are in support of women’s growing status relative to economic growth.

Jared Koerten (99)
Faculty Advisor/Collaborator: David Schaffer
Covert Inequity: Gender Discrimination through Occupational Categorization

Economists have widely recognized and published on the importance of gender as a determinant of an individual's wage. In response to the wide dissemination of ideas like the “glass ceiling” in labor markets, policymakers have worked to promote equal wage levels for men and women. These actions, however, are aimed at ensuring that women are paid equal wages as individuals on a case-by-case basis. Our research indicates that this approach may miss larger trends in wage differentials between men and women. By creating a variable that accounts for the ratio of men to women in over 500 occupations from 1971-2006, we witnessed a previously unobserved trend. Our findings indicate that occupations consisting mainly of females earn less than those that are male-dominated, and these wage discrepancies are increasing over time. Today, it may be illegal to discriminate against an individual female, but these laws do not prohibit paying lower wages to occupations composed primarily of women. Our research uses annual data of the Current Population Survey (published by the Bureau of Labor Statistics) from 1971-2006, and utilizes quantile regression analysis to highlight the significance of this trend at various wage levels.
Dustin Moltz and Justin Roettger (100)
Faculty Advisor/Collaborator: Eric Jamelske
An Exploration of Oil Shocks and Gasoline Prices in the US, Wisconsin and the Chippewa Valley

In 2008 US prices for oil soared to nearly $140 a barrel and gas prices also rose to over $4.00 per gallon. Shortly after this dramatic event both oil and gas prices fell sharply to less than $40 a barrel and $2.00 per gallon respectively. Because Americans have become very dependent on both oil and gas to power their lives this major swing in prices over a relatively short time span attracted a lot of attention. Our research poster will chart the historical prices for both oil and gas at the national level. In particular we will explore the most recent trends described above to other oil shock periods in history. We will also examine the relationship between the price of oil and the price of gasoline over time. Lastly we will compare recent trends in gas prices across the US, Wisconsin and the Chippewa Valley region. All data will be presented graphically as well as described and analyzed in text.

Chris Thompson (126)
Faculty Advisor/Collaborator: Yan Li
A Reappraisal of Trade Deficit and Income Inequality

The recent resurgence of income inequality in the United States has spawned a wide-ranging discussion of its causes, which has often focused on America's historically high trade deficit in the past two decades. Our paper investigates the latest trends in income disparity in the United States from 1985 to 2007, and then examines the factors that might influence income inequality, by applying a multivariate regression model. To better understand the income inequality, three different measures are employed: Gini, Theil, and Atkinson indexes. Results show that, in cases of Gini and Atkinson, the trade deficit explains only a part of income inequality. Other factors, such as union density, net migration rate and the percentage of the labor force in service industry play even more important roles in accounting for America's income disparity. In the case of the Theil coefficient, the impact of trade deficit on income inequality is extremely weak. This study is a systematic and novel examination of the role of trade deficit in understanding income disparity within a country, which provides a good environment for trade policy evaluation.

Geography and Anthropology

Jenny Briggs (54)
Faculty Advisor/Collaborator: Brady Foust
Determining the Presence of a Vernacular Region in the Mississippi Delta

A vernacular region is defined by people's perceptions. This research project examined the Mississippi-Yazoo Delta to analyze vernacular names associated with the Delta. My preliminary hypothesis is that there is a presence of a vernacular region associated with the Mississippi-Yazoo Delta. Data from Mississippi and Arkansas were collected from GoogleMaps using terms that are typically associated with the Delta area. The use of these terms in names of businesses will determine the presence or absence of a vernacular region. The data were mapped to analyze the intensity of vernacular names. Field work was conducted March 13-20, 2009 to check the validity of the conclusion.

Evan Byers (30)
Faculty Advisor/Collaborator: Brady Foust
Delta Blues Musician Concentration of the Delta

Delta Blues began in the 1920s and ever since then Delta Blues have been the staple cultural trademark. Many blues musicians were born in the Delta, but migrated out to northern cities and other parts of the south. This migrating scheme will be examined as part of this project. My hypothesis is that I will see a large difference between the concentration in the delta and the concentration in the rest of Mississippi.
Drive until you qualify is a phrase often cited as a major cause of urban sprawl and increasing dependence upon foreign oil. The primary idea is that house prices decay with distance from the center of a city because of falling land prices. This study analyzes empirical data from available real estate transactions to model the price/distance dynamic in the Twin Cities metropolitan area. While generally true, the phenomenon has strong directional biases and responds well to transportation corridors and physical barriers.

Jenna Christian (55)
Faculty Advisor/Collaborator: Ingolf Vogeler
Post-Conflict Geography and Land Tenure in Liberia

At the height of Liberia’s 14-year civil conflict over 800,000 people were displaced. Since 2004, over 600,000 people repatriated, and more return to this day. Today, one of the most crucial issues to Liberia’s future stability is land. As people return after years of absence some resettle on new lands or return to their area of origin, yet others return home to discover there’s a competing claim to their landholdings. Ownership documentation is scarce, laws regarding property are unclear and unevenly enforced, old tribal rivalries are re-opened over access to natural resources, and opportunists take advantage of the confusion within the system. Sharing in the task of addressing these issues are the UN, government agencies, and international and local NGOs, which oversee resettlement in varying capacities and work to mitigate disputes. During three months in the field—both in Monrovia and rural Liberia—interviews and surveys were conducted with returnees, aid workers and government officials, and with landowners engaged in property disputes. Through examination of Liberia’s post-conflict geography, the presentation will address the need for a better understanding of the effect of resettlement on land and resource allocation. These are vital in rebuilding Liberia’s communities, economies, and a stable society.

Glen Eastman (72)
Faculty Advisor/Collaborator: Jeff De Grave
GIS-Based Maps for Non-English Speaking Latino Immigrants in Eau Claire County

Latinos represent the fastest growing minority population in the United States today, and Wisconsin is no exception. According to the U.S. Census Bureau, Eau Claire County has seen its Latino population increase by 33% since 2000, a trend which is expected to continue into the foreseeable future. Shaun Duvall, director of Puentes/Bridges, a non-profit organization dedicated to helping Latinos adjust to their new communities, indicated that maps which are specifically geared to recently-arrived immigrant workers would be a significant tool in helping to ease their acclimation within American society. The use of Spanish language based maps which would include day-to-day amenities (grocery stores, medical / dental facilities, schools, etc.) would help with the relocation process. These maps, which may be individually distributed to migrant communities, are also slated for incorporation into another project, “Resource Booklet for New Hispanics in Western Wisconsin,” a directory of services frequently needed by Latino immigrants. Through the technology of GIS (Geographic Information Systems), these projects may be digitally interfaced and implemented with similar efforts across Wisconsin, helping to create a smoother transition for not only the immigrants, but the communities in which they live.

Tracey Grubb and Darin Mertig (75)
Faculty Advisor/Collaborator: Brady Foust
The Geographic Analysis of Cotton Production in the Delta Blues and Black Belt Regions

The Delta Blues region in the southern United States is a unique region both in the physical and cultural landscape and is different from its surrounding regions. The Delta Blues region stretches from Memphis to Vicksburg. As part of the Black Belt region (defined by the region’s dark soils in Alabama, Mississippi, and Georgia) the Delta has a long history in cultivating cotton. With the emergence of the cotton gin in
the 18th century, cotton in this region experienced an agricultural boom. This project will analyze changes in agriculture throughout the Delta and the Black Belt. This data will be analyzed using GIS spatial models to create spatial models of the changes that have occurred throughout these decades.

Andrew Kelton (56)
Faculty Advisor/Collaborator: Joseph Hupy
*Relationship between Climate and Snowmobile Sales in Wisconsin*

Casual observations in northern climates have shown that mild winters lead to a reduction in snowmobile sales. This study compared the relationship between winter climate and snowmobile sales, hypothesizing that when mild winters occur snowmobile ownership decreases. A general study was performed by region across the United States, while a more specific, detailed study was done on key cities in Wisconsin, a state well known for its snowmobiling industry. Climatic data including temperature, winter precipitation, and snowfall were collected from the Wisconsin State Climatology Office. National snowmobile sales data, organized by region, were obtained from International Snowmobile Manufacturer's Association. Local snowmobile sales data for Wisconsin were gathered from Eau Claire and Milwaukee, Wisconsin newspaper classified advertisements.

Kyle Kundert (8)
Faculty Advisor/Collaborator: Brady Foust
*Demographic Investigation of the Mississippi Delta/Black Belt*

This project will analyze several demographic or socioeconomic factors to distinguish the distinctive area known as the Mississippi Delta/Black Belt. This region originally relied on agriculture, particularly cotton production facilitated by the rich soils in the region. The Mississippi Delta/Black Belt stretches across Mississippi, Alabama and Georgia. The analysis that follows will attempt to identify the particular socioeconomic conditions that have changed the landscape since the collapse of cotton production in the Mississippi Delta/Black Belt. Those unique distinctions make it culturally and economically different from the surrounding regions.

Jonathan Laager (73)
Faculty Advisor/Collaborator: Joseph Hupy
*Using GIS to Reconstruct the History of the Siege at Khe Sanh, Vietnam*

In order to understand geography, one needs to know history, and in order to understand history, one needs to know geography. Modern geographic information science via geographic information systems (GIS) links the two in ways never before possible. Using a GIS database containing both tabular and spatial information allows for both the creation of cartographic displays, and for spatial analysis. This research project led to the creation of a GIS about the battlefield of Khe Sanh, Vietnam. A place of military significance throughout the Vietnam War, Khe Sanh has been addressed by historians and cartographers, but it has been overlooked by modern geographic analysis. The GIS created from this project has addressed this dearth of research. Some features of this Khe Sanh GIS include, but are not limited to, tabular listings of fatality points on the battlefield from Khe Sanh veterans organized by day, a database to query events by location such as certain hills or coordinates, and a record of the cause of deaths, such as plane crash, gun shot, or wounds, for further analysis of the battlefield. This unprecedented geographic analysis of the Khe Sanh battlefield promises to open a large venue of future research paths.

Pa Sia Moua (78)
Faculty Advisor/Collaborator: Ingolf Vogeler
*Hmong Cultural Landscape*

This research project is a closer look into the Hmong community in Eau Claire, Wisconsin, to build an understanding of the patterns in which the Hmong population reside and how their cultural practices and
Katrina Murry
Faculty Advisor/Collaborator: Brady Foust
An Air Traffic Destination Model for Portland, Oregon

Studies of air traffic flows in the United States have generally focused on hubs. When origin/destination traffic is analyzed at the final destination level a more nuanced picture emerges. This study looks at the final destination cities for flights originating in Portland, Oregon: PDX. The flows were initially modeled using a simple gravity model based on destination population and distance/cost. The anomalies from the general pattern reveal cultural and economic links between Portland, Oregon and its destinations that have interesting implications for the national space-economy.

Katrina Murry
Faculty Advisor/Collaborator: Brady Foust
A Comparative Analysis of Restaurant Concentrations in the Mississippi Delta

There are many vernacular regions throughout the United States. The South is a vernacular region with a culture unlike any other area in the country. In particular, the food culture is very distinct to this area. From barbeque to tamales the South contains the highest concentration of restaurants themed after these categories. This research project will consist of collecting data containing these concentrations and comparing them from region to region. With this data maps will be made for each specific cuisine to their respective regions. The resulting maps can be used not only for tourism but economic analysis as well.

Bethany Nelson
Faculty Advisor/Collaborator: Brady Foust
An Air Traffic Destination Model

Studies of air traffic flows in the United States have generally focused on hubs. When origin/destination traffic is analyzed at the final destination level a more nuanced picture emerges. This study looks at the final destination cities for flights originating in Milwaukee (MKE), Pensacola (PNS), and Sioux Falls (FSD). The flows were initially modeled using a simple gravity model based on destination population and distance/cost. The anomalies from the general pattern reveal cultural and economic links between Milwaukee, Pensacola, and Sioux Falls and its destinations that have interesting implications for the national space-economy.

Bethany Nelson and Josh Rizzo
Faculty Advisor/Collaborator: Brady Foust
Migration Patterns in the Mississippi River Delta

The purpose of this project is to determine the differences in migration patterns between the Mississippi Delta counties and the rest of the state. The secondary objective is to identify specific patterns that influence migration to and from the Delta, such as demographic and economic factors that make the Delta region unique. The data is obtained from the 2000 Census migration data and reports. The information is in two tables showing in-flow and out-flow data of persons moving to and from Mississippi between 1990 and 2000. Census block group data will also be used to identify push and pull factors.

Lindsay Olson
Faculty Advisor/Collaborator: Brady Foust
Geospatial Analysis of Flight Destinations: A Study of Flight Patterns from Tucson, AZ, Jackson, MS, and Appleton, WI

Studies of air traffic flows in the United States have generally focused on hubs. When origin/destination
traffic is analyzed at the final destination level a more nuanced picture emerges. This study looks at the final destination cities for flights originating in Tucson, AZ (TUS); Jackson, MS (JAN); and Appleton, WI (ATW). The flows were initially modeled using a simple gravity model based on destination population and distance/cost. The anomalies from the general pattern reveal cultural and economic links between the three cities and their destinations that have interesting implications for the national space-economy.

Lindsay Olson (49)
Faculty Advisor/Collaborator: Brady Foust
A GIS-Based Analysis of Agricultural Land Use Change in the Mississippi Delta

The Mississippi Delta is not actually a delta, but is an alluvial plain located between the Yazoo and the Mississippi Rivers. The delta has historically been used for cotton and rice farming due to its superb agricultural qualities. It is hypothesized that land use has changed as we have transitioned into the 21st century and increased imports of food and clothing items from other countries. Mechanization also sped the process of soil exhaustion causing a change in land use as well. This project will illustrate how land use has changed from agriculture to other types of land use over the last decade of the 20th century, specifically between the years 1992 and 2001.

Josh Rizzo and Thomas Michels (27)
Faculty Advisor/Collaborator: Christina Hupy
The Geography of Liquor and Crime through Regression Analysis

Previous research has identified a positive correlation between liquor license density and crime density for many medium sized cities throughout the United States. Such research can be used for crime analysis and assist in decisions regarding liquor licensing. The purpose of this research is to explore the relationship between liquor license density and crime density in the city of Eau Claire within a GIS framework. Liquor licenses within the city of Eau Claire were obtained from the EC Health Department, and geocoded, i.e. each address was mapped. All crime data was obtained from the EC Police Department and also geocoded. A grid, with cells of 100 meters in size, was then placed over the study area and used to calculate both liquor license and crime density. Census data, including average household income, unemployment rate, and average age, were also then associated with the cells. Regression analysis was then performed in order to explore the relationship between crime density and the independent variables. The results of this study are intended to inform the Eau Claire County board, so that liquor licenses will be distributed with higher regard for the impact on surrounding areas.

Ryan Robert (12)
Faculty Advisor/Collaborator: Brady Foust
Examining Voting Patterns within "Black Belt" States

The purpose of this research is to analyze the relationship between key socioeconomic variables and voting patterns within the states of Mississippi, Alabama, and Georgia. The “Black Belt,” a region originally named for its rich black soils, runs horizontally through these three states. An overwhelming majority of counties within the “Black Belt” also voted majority Democrat in the 2008 Presidential Election. Therefore, the dependent variable will be percentage of Democrat vote by county. The independent variables include measures of education, income, population, age, race, and poverty. The general hypothesis suggests there is a direct, positive relationship between the percentage of votes cast for Democrat and education level, population density, age, and percentage under poverty. There should be an inverse relationship between percentage of votes cast for Democrat and level of income and percentage of black population. Additional field work throughout the Delta region (March 13-20, 2009) provided an excellent supplement to this project. It allowed me to personally observe the dynamics of the cultural area under consideration and capture photographs that add an additional visual element to my analysis.
Hunger is the greatest global issue facing contemporary society. 800 million people suffer from hunger, with an estimated 34,000 children dying daily - a Hiroshima bomb every three days (Collins, Lappe, & Rosset, 1998). This research, part of the Blugold Fellowship program, analyzes various readings to develop trends in definitions, causes, and effects of, as well as possible solutions to, world hunger. A variety of data is also included from the Food and Agriculture Organization of the United Nations, and is interpreted and displayed using geographic information system (GIS) software.

Military Geography is the study of spatial aspects, both manmade and natural, which affect the planning, conduct, and aftermath of military operations. A fall 2008 military geography class was divided up into two teams and conducted a paintball capture the flag exercise as part of a semester research project. The study area was approximately 500 acres and was a combination of both forest and some outer areas of farmland. There was also a combination of both higher elevation and low-lying flood plains within the forest. The purpose of this exercise was to become familiar with navigation techniques and geospatial equipment in a realistic application. Both teams conducted preliminary analysis of the study area using geospatial analysis of terrain, climate, soils and elevation. Lastly, both teams created maps for navigation and strategic plans with possible flag locations and trails to use to try to defeat the opposing team. This exercise was an excellent application of studying the physical environment and the utilization of GIS in a useful application. The maps and strategic plans were very helpful in navigating the study area efficiently and both teams were successful in locating their opponent's flag.

This study examines the relationship between involvement, as victim or offender, in cyberbullying and self-esteem among middle school students. During March and April of 2007, a random sample of 1,963 middle school students from thirty school districts in the United States completed a survey of Internet uses and experiences. Based on traditional bullying literature, it is hypothesized that students who have been involved in cyberbullying will have lower self-esteem than those who have not been involved in cyberbullying. This study found that students who had been involved cyberbullying had significantly lower self-esteem than those students who had little or no involvement with cyberbullying. Therefore, bullying prevention programs should include information about cyberbullying.

This research project was conducted to gain a comprehensive overview of the prevalence of cyberbullying. This has been conducted by collecting and analyzing all articles with original empirical research in the past several years. Results from each study were extracted and compared with the results from numerous other studies. Relevant findings, such as victimization and bullying rates, were compared. Other findings from this research include problems with a consistent definition of
“cyberbullying” along with many methodological differences in the studies that were examined (including a greatly varied sample size and method of gathering data).

Kimberly Tanguay (28)
Faculty Advisor/Collaborator: Geoffrey Peterson
Television Portrayals of the US Intelligence Community

The image of the intelligence community in the media has always been connected to the public’s perception of the role and importance of those agencies. During the height of the Cold War, the intelligence community was one of the forces of “good” fighting against the evil Soviet Union. Even when those activities were illegal (such as in Mission: Impossible), their actions were portrayed as being for the greater good, at least from a US-centric perspective. In the 1970s, media portrayals switched from positive to negative. For this period, the role of intelligence agencies was to either serve as villains using extra-legal means (The X-Files) or buffoons (Spy Game). This view appears to have changed, however, in the post-9/11 era. New portrayals clearly show intelligence officers as diligent, hard-working, heroes. We will examine this shift, focusing on members of the intelligence community as characters in three series, The X-Files, Alias, and 24. We will highlight the differences in terms of how illegal and extra-Constitutional behaviors are portrayed. We also intend to match this information with public opinion data regarding the role and stature of the intelligence community with the American public.

Psychology

Andrew Baldwin (196)
Faculty Advisor/Collaborator: Allen Keniston
Parenting Style and High School Achievement as Predictors of College Adjustment

College presents a new academic and social environment to first year students. Although many variables determine students’ success, a major influence is students’ ability to adapt to this new college environment. Social adjustment is a significant predictor of student retention. Students make the transition variously well. This study examines sources of differences in students’ ability to adjust to college. To do so, this study determines the parenting style by which participating students were raised using Steinberg’s Parenting Style Index. This study also assesses participants’ emotional intelligence using the Assessing Emotions Scale and academic achievement using self reported ACT scores. Students with high emotional intelligence and academic achievement should show the highest level of adjustment. Adjustment to college is measured using the Student Adaption to College Questionnaire (SACQ). Results should provide information to better assist students’ adaptation to college, which could subsequently improve student performance and retention. Findings will also be pertinent to theories of parenting and the mechanisms by which parenting promotes or hinders growth to psychological maturity.

Andrew Baldwin (195)
Faculty Advisor/Collaborator: Allen Keniston and P.J. Kennedy
The 2008-2009 UW-Eau Claire Counseling Needs Assessment

Students access university counseling services for numerous reasons. University counseling services provide crucial psychological support for students. Aside from not doing well in school or adjusting poorly to social environments, there are potentially other severe consequences of psychological illness. Understanding the importance of university counseling services is critical to ensure that the services provided are top notch. One way to ensure quality service is to tailor services to students’ needs. This study will examine precisely that. Questions this study aims to answer include: What problems are students facing? How severe are the problems in their daily lives? How likely would students be to use university counseling services to help resolve their problems? To answer these questions a needs assessment tool is being administered to a random sample of 20 percent of the approximately 10,000 students attending the University of Wisconsin-Eau Claire. Results will yield insights into the nature and prevalence of issues students are facing. Outcomes of the study will enable university counseling
services to assess current programs available to students and to decide whether or not new or different programs should be made available. Results from this study may also influence future decisions about hiring new counselors.

Allyson Buccanero (263)  
Faculty Advisor/Collaborator: Blaine Peden  
The Media and College Students: Influence on Written Responses

The media is an ever-present part of modern day life with great potential to influence our thoughts and moods. This study investigated whether this influence existed in an undergraduate sample by random assignment to either a news segment or a portion of a National Geographic program that were judged as significantly different on levels of positive and negative tone. The Language Inquiry and Word Count will be used to analyze participants' written responses to examine any differences in the quantitative amount of positive or negative emotion words used, with the hypotheses that responses from participants who viewed a negatively-toned news segment would use more negative emotion words than those viewing the National Geographic program, and that upperclassmen would use more negative emotion words in the negative condition more so than underclassmen participants.

Jonathon Burton (151)  
Faculty Advisor/Collaborator: Daniel Holt  
Service-Learning in the Disciplines: Correlational Research on Service-Learning Project Type and Student Majors at the University of Wisconsin-Eau Claire

Information on student major and service-learning project from the years 2000-2008 was gathered from the UWEC Center for Service Learning. Service-learning projects were grouped into different project types and were coded into SPSS, along with student majors, and whether the project was done on- or off-campus. Correlations between major and project type were measured to investigate whether student major acts as a predictor of the type of service learning project undertaken.

Johnathan Chase, Nathaniel Murken and Ashley Zellhoefer (197)  
Faculty Advisor/Collaborator: Allen Keniston  
PowerPoint as a Facilitator of the Learning Benefits of Note-Taking During a Lecture

Note-taking is well documented as an aid to students' understanding and comprehension of lectures. The widespread use of PowerPoint as a lecture aid leads to questions about how PowerPoint and note-taking interact to influence student learning. From one perspective, PowerPoint slides may free cognitive resources to promote encoding and comprehension of lecture material. From another perspective, efforts to copy PowerPoint slides may interfere with understanding and recall of lecture content. Either way, there are no data about the issue. We will perform an experiment to test hypotheses about how note-taking may interact with viewing PowerPoint slides during a lecture. Half of our participants will view a lecture accompanied by a PowerPoint outline of the lecture, half will view the lecture only. Half of each group will take notes and half will not. We expect note-taking to enhance participants' memory and comprehension of the lecture, but that PowerPoint slides alone will have little or no effect. However, we expect the note-taking with PowerPoint slides to produce the best performance by individuals in the four experimental groups. Results of this experiment will both inform PowerPoint use and offer understanding of cognitive mechanisms involved in the effects of PowerPoint and note-taking.

Stephanie Dorn (265)  
Faculty Advisor/Collaborator: Catya von Karolyi and Blaine Peden  
Dabrowski's Overexcitabilities, The Big Five, Intelligence, and GPA

Nonintellective factors of intelligence have long been researched in Psychology. We examined personality correlates of intelligence using two models: Dabrowski’s Overexcitabilities (OEs), made up of five intensities: Imaginational, Intellectual, Emotional, Psychomotor, and Sensual and The Big Five
factors: Openness to experience, Conscientiousness, Neuroticism, Extraversion, and Agreeableness. A review of the literature pertaining to Dabrowski’s model revealed reasonably consistent associations between giftedness and Intellectual, Imaginational, and Emotional Overexcitabilities; less consistent associations between giftedness and Psychomotor overexcitability; and little to no association between giftedness and Sensual overexcitability. A review of the literature pertaining to the Big Five revealed reasonably consistent associations between higher intelligence and higher scores on Conscientiousness and Openness to Experience and some evidence that Neuroticism, Extraversion, and Agreeableness are associated with higher intelligence. College students’ GPA and self-report as being identified as gifted served as proxies for intelligence. We hypothesize that, as was found in the literature, specific OEs are associated with intelligence in college students. We further hypothesize that specific Big Five factors are associated with intelligence, as was found in the literature. Finally, we hypothesize that a relation exists between specific factors of the Big Five and specific OEs in relation to intelligence.

**Kristine Funk** and **Jessica Pernsteiner** (170)
Faculty Advisor/Collaborator: **Daniel Holt**

*Effect of Conditioned Reinforcer Type on Acquisition of Targeting Behavior in Canis familiaris: Clicking versus Vocalizing*

In the 20th century B. F. Skinner converted haphazard animal training into a scientifically based process called operant conditioning (Peterson, 2004). Skinner also discovered that delivering a reinforcer to animals at the exact moment a desired behavior was performed was critical. To solve the problem created by delays in delivery of reinforcers Skinner proposed using a stimulus that could be “conditioned” as a reinforcer (CR) to signal to an animal that a food reinforcer was coming. In animal training the CR has become widely accepted as an indispensible tool for shaping behaviors (Pryor, 1999; Spector, 1999). Static sounds have traditionally been used in training, yet only anecdotal evidence exists to support using a static sound over a verbal CR (Pryor, 1999; Pryor, 2005). The current study tested the hypothesis that dogs will learn faster when a “Click” CR is used than when a verbal word, “Good,” CR is used in training dogs to touch and follow a target.

**Kathryn Glodowski, Chelsea Hedquist, Jeffrey Miller and Amanda Buchmeier** (127)
Faculty Advisor/Collaborator: **Kevin Klatt**

*Investigating Break Points in Progressive-Ratio Schedules of Reinforcement for Young Children with Autism*

Therapists who provide behavior therapy to children with autism need reinforcers. Researchers have used various assessments in order to determine children’s preferences for reinforcers (Pace, et al., 1985; Fisher et al., 1992; Windsor, et al., 1994; DeLeon & Iwata, 1996) but results indicate these assessments may not be accurate in determining which items will function as reinforcers (Tustin, 1994; DeLeon et al., 1997). Roane et al. (2001) compared various stimuli under a preference assessment and also under a progressive-ratio (PR) schedule of reinforcement and found the PR schedule to be more accurate in determining which items would better function as reinforcers under increasing response requirements. Clinicians need to quickly identify reinforcers, and the step size used in PR schedules may affect the speed with which the subjects reach the break point (Hodos & Kalmann, 1963). Currently, research has not examined this effect in an applied setting. The present study will examine the effects of the step size on the break point in PR schedules with children with autism.

**Kathryn Glodowski and Rochelle Smits** (146)
Faculty Advisor/Collaborator: **Daniel Holt**

*Temporal Discounting of Various Gift Card Types*

Many researchers have examined individuals’ selection between a small, immediate outcome and a large, delayed outcome. A robust finding from previous studies shows that as the delay to an outcome increases, the subjective value of the outcome decreases. This phenomenon has been termed temporal discounting (Raineri & Rachlin, 1993). Researchers have examined how individuals temporally discount various outcomes, including consumable and non-consumable outcomes (Estle, Green, Myerson, & Holt,
2007; Odum & Rainaud, 2003). Results from these studies suggest that individuals discount non-consumable outcomes (money) less steeply than immediately consumable outcomes (candy, soda, drugs, etc.). It has been suggested that the difference between outcomes may be due to characteristics of the conditioned reinforcer. The present study sought to examine temporal discounting of conditioned reinforcers (gift cards) for qualitatively different outcomes where the characteristics were manipulated (money, clothes, and food) in order to further expose the role of the conditioned reinforcer on how individuals make decisions.

Sarah Hammon, Amy Steffes and Amanda Draxler (223)
Faculty Advisor/Collaborator: April Bleske-Rechek
Correlates of Continued Involvement in Physical Activity from High School to College

Regular physical activity enhances physiological and psychological health (Healthy People 2010, 2000), but regular physical activity is not the norm in American society. In fact, physical activity levels drop from high school to college and drop again after college graduation. We investigated college students’ self reports of involvement in physical activity during high school and college in relation to their standing on the five major personality factors, trait competitiveness, and motivations for involvement. Participants reported on their physical activities in high school and college, including annual and session frequency and motives for participation based on the Exercise Motivation Inventory-2 (Markland & Ingledew, 1997). They also completed the Competitiveness Index (Houston, Harris, McIntire, & Francis, 2002) and the Mini-Markers personality assessment (Saucier, 1994). Given previously documented links between personality and exercise behavior, we expected extraversion and emotional stability to correlate positively with adherence to physical activity from high school to college; we also predicted that intrinsic motivation and trait competitiveness would correlate positively with adherence. The results of our study provide guidance for using knowledge of personality and past experiences with physical activity to promote continued physical activity from high school to college.

Chelsea Hedquist (173)
Faculty Advisor/Collaborator: Daniel Holt
Goldfish Group Choice: Tests of the Ideal Free Distribution and Matching Theory

The purpose of the present study was to examine the effects of resource allocation on group foraging behavior. Twelve goldfish were kept in a 20 gallon fish tank with two separate food source patches. Using naturalistic observation with an A-B-C design, food was distributed to the patches differentially across three conditions. In one condition the right-side patch was “rich” and the left-side patch was “lean,” in a second condition the patch richness was reversed, and in a third condition food was evenly distributed to each patch. Of interest was how the goldfish would distribute themselves between the patches. The results indicate that, as a group, the goldfish were indeed sensitive to the changes in resource allocation. That is, as the ideal free distribution theory (or habitat matching) predicts, the goldfish formed groups proportional in number to the resources available in the food patches. On closer inspection of the data, however, a systematic deviation towards indifference between the patches (undermatching) was revealed. This tendency towards indifference is a consistent finding in the group distribution literature.

William Hendricks, Amber Jamelske, Beth Lutz and Ellie Lutz (148)
Faculty Advisor/Collaborator: Lori Bica and Eric Jamelske
Impact of the USDA Fresh Fruit and Vegetable Program on the Attitudes and Behaviors of Elementary School Students in Eau Claire, Wisconsin

The United States Department of Agriculture (USDA) Fresh Fruit and Vegetable Program is designed to improve nutrition and help reduce childhood obesity. Specifically, this program funds the provision of daily fresh fruit/vegetable snacks to elementary school students across the country. Schools have also incorporated into their curriculum various educational components designed to promote fruits/vegetables as a healthy food choice. We are conducting an evaluation of outcomes associated with this program using student surveys, site coordinator reports, teacher surveys, and parent surveys. Two Eau Claire program schools and two control schools are participating in the study. The focus of this poster is to
describe preliminary student survey findings from the pretest and first posttest, which was conducted approximately two months after program implementation. Specifically, we investigate program participants’ attitudes toward trying different fruits/vegetables and their fruit/vegetable consumption relative to those in the control group.

Kelsey Johnson (221)
Faculty Advisor/Collaborator: Daniel Holt
Do Multiple Trainers Increase the Speed of Canine Ability to Generalize a Learned Behavior?

Animal training began in the mid-5th century B.C., but in 1852 a behavioral training ideology reconstructed training procedures. Canine trainers recognized the importance of teaching canines to discriminate between commands. The ability to discriminate commands allows the handler to maintain control over the dog. Canine trainers acknowledged the importance of having a canine perform the correct behavior in a variety of situations (i.e., generalization). Surprisingly, relatively little is known about factors that allow a canine to generalize. Of specific interest is whether explicitly training with multiple trainers will increase the animal’s ability to generalize to other handlers. The current study taught canines in three different conditions to sit on command and remain sitting for five seconds. Canines in condition one were trained by a single trainer for eight sessions. Canines in condition two were trained by the primary trainer and another trainer, each training four sessions. Canines in condition three were trained by the primary trainer for two sessions and three other trainers each trained two sessions. Following the eight training sessions all the canines were then given a generalization test. The results of the generalization tests are discussed in terms of efficacy of canine training.

Elizabeth Kooistra (147)
Faculty Advisor/Collaborator: Kevin Klatt
The Effects of Motivating Operations on the Transfer from Labels to Requests for Children Diagnosed with Autism

In this study motivating variables were manipulated to examine the effects on teaching children with autism to request for preferred items after teaching them how to label the items. A 24-hr or more deprivation of the preferred item condition and a pre-session exposure to the preferred item condition were compared using an alternating treatments single-subject experimental design. Three children diagnosed with autism were first taught to label (tact) a high preferred item, as determined by a preference assessment. Then the children were tested to see whether they would request (mand) the item under both deprivation and pre-session exposure. The children requested their high preferred item under both conditions but there was variability between the conditions.

Melissa Lighthall (246)
Faculty Advisor/Collaborator: April Bleske-Rechek
Attractiveness and Rivalry in Women’s Friendships with Women

Past research suggests that young women perceive their same-sex friends as both facilitating the pursuit of desirable mates and competing for access to desirable mates. We propose that similar – but not identical – levels of physical attractiveness between young adult female friends might be one explanation for the opposing forces in their friendships. Forty-six female friendship pairs completed questionnaires about themselves, their friend, and their friendship; in addition, each woman’s picture was taken and rated by a set of nine naïve judges. Friends were similar in both self-rated and other-rated level of attractiveness. Within pair analyses revealed that women agreed on which friend was more attractive, and the less attractive members of each friendship pair (by pair consensus as well as outside judges’ ratings) perceived more mating rivalry in their friendship than did the more attractive members of each friendship pair. We offer directions for research on women’s friendships over the lifespan.
Randy Lim and Casandra Lloyd (277)
Faculty Advisor/Collaborator: Catya von Karolyi
Hierarchic Visual Spatial Task Performance: Aspatial versus Spatial Majors

Navon (1977) developed a hierarchic visual spatial task in which the stimuli were large letters, at the global level, made up of small letters, at the local level. For most people, processing at the global level is faster than is local processing when responding to Navon-style Hierarchic visual spatial tasks. Processing speed increases with practice at both the global and local levels. We hypothesize, therefore, that undergraduate college students majoring in spatial majors, such as Art and Physics, would perform better at a hierarchic visual spatial task than those in an aspatial major, such as psychology. The stimuli for our task were presented on a computer that recorded participants’ response time and accuracy for identifying figures at either the local or global level. The stimuli we used were made up of icons, rather than letters. For example, one figure appears to be an anchor at the global level, made up of small cups at the local level. Based on past research, we also hypothesize that males will be faster than females at processing global information and females will be faster than males processing local information.

Caryn Ling (220)
Faculty Advisor/Collaborator: Allen Keniston
A Case Study of Using Divided Attention to Promote Focused Attention

Attentional processes vary by individual. The proposed poster will describe a remarkable case study of an individual who needs to divide her attention between two tasks to attend optimally to one. In particular, she needs to do Suduko puzzles during a lecture in order to process information from the lecture. The case analysis will apply the concepts of working memory, attentional blink, and multitasking to explain her unique attention skills and requirements. The goal of the analysis will be to show how and why the individual needs to be doing two things at once to focus her attention. The conceptual analysis will be supplemented by summaries of recent research consistent with the hypothesis.

Kelsey Michels, Abigail Stellmacher and Julia Wippler (247)
Faculty Advisor/Collaborator: April Bleske-Rechek
RateMyProfessors.com: Instructor Ratings by Instructor Gender, Discipline, and Academic Degree Status

RateMyProfessors.com (RMP.com) is an open forum for student ratings and commentary on university instructional staff. The few published analyses of website ratings suggest that student ratings from RMP.com parallel ratings on traditional student evaluations of instruction. For example, ratings tend to be positive overall, and ratings of quality and easiness are positively correlated. The website holds student ratings from over 550 instructional staff at UWEC, and in the current study we report on our analyses of 322 instructors who have received 10 or more ratings since 1999 (M = 26.5 ratings). In addition to replicating the findings mentioned above (e.g., correlation between quality and easiness = .50), we documented the following results: (1) instructors of differing quality and easiness ratings did not differ in the frequency with which students rated them; (2) instructors in the “hard” sciences were rated as most difficult, but of similar quality, relative to instructors from other disciplines; (3) masters level instructors were rated as both easier and of higher quality compared to doctoral level instructors; (4) ratings of male and female instructors were generally similar. We discuss the varied interpretations of these correlational findings.

Kelsey Michels, Abigail Stellmacher and Julia Wippler (260)
Faculty Advisor/Collaborator: April Bleske-Rechek
To Complain or Exclaim? Students' Use of RateMyProfessors.com

RateMyProfessors.com launched in 1999 as an avenue for students to offer public ratings and commentary about their university instructors. Past research pertaining to the website has focused specifically on the ratings and comments rather than on the students who post. Given this lack of information about the students who use RateMyProfessors.com, we surveyed 205 UW-Eau Claire
students regarding their use of the website. The large majority of students had visited the website on multiple occasions to view others’ ratings and commentary. They ranked ratings of instructor clarity and helpfulness as the most important pieces of information provided by peers. A total of 22% had posted ratings for an instructor; they offered both positive and negative reasons for posting. With these data, we investigated links between use of RateMyProfessors.com and student characteristics such as achievement goal orientation, gender, year in school, and GPA. We discuss our findings in the context of assumptions on campus about students’ use of RateMyProfessors.com.

Kelsey Michels (261)
Faculty Advisor/Collaborator: Barbara Lozar
An Analysis of Metaphor Teaching Methods

This study examined metaphors and the effect the method of presentation as well as the metaphor type had on their understanding in kindergarten, second, and fourth graders. Participants were presented with both transparent and opaque metaphors in three different conditions: a with-context condition, a with-picture condition, or no-context, no-picture condition. Participants were then asked to respond to the meaning of each metaphor. Understanding of the metaphors increased with grade level and the understanding of transparent metaphors was slightly better than opaque metaphors across grade levels. Also, the with-picture condition resulted in the highest scores, followed by the with-context condition, and finally the no-context, no-picture condition.

Jeffrey Miller, Jonah Streff, Nicole Scharrer and Katie Wiskow (198)
Faculty Advisor/Collaborator: Daniel Holt
Shaping vs. Percentile Shaping

Shaping has been defined as the differential reinforcement of a series of successive approximations to a target behavior (Miller, 2006). Shaping is a powerful method for researchers to create and promote changes in behavior. The skill of shaping behaviors has commonly been thought to be an “art,” where the trainer’s opinion dictates the advancement of the subject’s approximation towards the target behavior. Some researchers have stated that because shaping is an “art” there is a lack of precision and consistency in the implementation of shaping techniques, making the techniques less effective (Galbicka, Kautz, & Jagers, 1993). To remedy the issue of precision and consistency, Galbicka et al. suggests the use of percentile shaping, a technique that uses preset formulas and guidelines to determine the advancement through successive approximations. The present study sought to compare standard shaping and percentile shaping to determine which shaping approach would facilitate faster skill acquisition in canines. A within-subjects across-behaviors design was used to evaluate the relative effectiveness of each shaping technique. Findings from this study will determine the more efficient method for shaping new behaviors.

Jennifer Jorandby, Stephany Reetz, Kathryn Larson, Kathryn Glodowski and Amanda Buchmeier (150)
Faculty Advisor/Collaborator: Kevin Klatt
Comparison of Prompting Procedures on Intraverbal Behavior on Children with Autism

Teaching intraverbal behavior is important in the development of communication skills and social interactions among children with autism. Echoic, picture, and textual prompts have been compared in their effectiveness in teaching intraverbal behavior to these children. Previous research with children diagnosed with autism has also shown that when comparing echoic and textual prompts, textual prompting is more effective on the acquisition of intraverbal skills. Few studies, however, have examined the effects of echoic, picture, and textual prompts on intraverbal behavior. The current study compares the three prompting procedures in teaching intraverbal behavior to four children diagnosed with autism. Comparisons between prompting procedures were evaluated on the acquisition, generalization, and maintenance of intraverbal behavior. Data are currently being collected and the results will indicate which prompting procedure is more effective in teaching intraverbal behavior to children diagnosed with autism.
Lyndsay Nelson (25)
Faculty Advisor/Collaborator: April Bleske-Rechek
*Moral Decisions in the Trolley Problem: People Save Five over One Unless the One Is Young, Genetically Related, or a Romantic Partner*

We investigated moral decision-making in an ethical thought experiment known as the Trolley Problem. In the original Trolley Problem, readers must decide whether they will save the lives of five people tied to a track by pulling a lever to sacrifice the life of one person tied to an alternate track. According to Inclusive Fitness Theory, people’s moral decisions should favor the well-being of those who are reproductively viable, share genes, and provide reproductive opportunity. In two studies (Ns = 652 and 956), we manipulated the sex, age (2, 20, 45, and 70 years old), genetic relatedness (0, .125, .25, and .50), and potential reproductive opportunity of the one person tied to the alternate track. As expected, men and women were less likely to sacrifice one life for five lives if the one hypothetical life was young, a genetic relative, or a current mate.

Holly Perszyk, Jeffrey Miller and Kayla Edwards (219)
Faculty Advisor/Collaborator: Daniel Holt
*Is Ending Training Sessions With a Correct Trial a Strong Predictor of Subsequent Trial Success?*

The basic operant conditioning paradigm states that behavior is followed by consequences and when these consequences are reinforcing, the likelihood of that behavior occurring again increases. Animal trainers have been in disagreement regarding whether ending a session with a correct trial is or is not a strong predictor of success in subsequent training sessions and faster skill acquisition. During all of our canine training sessions reinforcers are presented contingent on the occurrence of the target behavior, sit. In the present study we randomly placed canines into one of two conditions while training the sit behavior. In the “correct” condition, a training session was terminated immediately after the first correct response was emitted after a minimum of 10 trails had been completed. In the “error” condition, a training session was terminated immediately after the first error trial after a minimum of 10 responses. It was hypothesized that ending a session with a correct trial would increase correct responding in the initial trials of subsequent sessions and also lead to faster overall skill acquisition. The findings from the current study are discussed in the context of efficacious animal training.

Lindsey Sime (264)
Faculty Advisor/Collaborator: David Jewett
*Effects of Naltrexone in an Animal Model of Hunger*

We have developed and refined a food-deprivation discrimination paradigm that may serve as an animal model of ‘hunger’. We examined the ability of drugs that decrease food intake in human and non-human animals to alter the discriminative stimulus effects of acute food deprivation. Rats were trained to discriminate between 2 and 22 hrs of acute food deprivation in an operant choice paradigm. Generalization testing began after the discrimination was acquired (~90 daily sessions). During these generalization tests, subjects were food deprived for 22 hours. Subjects were administered several doses of naltrexone, sibutramine and rimonabant prior to the generalization tests. Sibutramine significantly decreased the discriminative stimulus effects of 22 hours food deprivation and reduced food intake. Naltrexone and rimonabant did not affect the discriminative stimulus effects of food deprivation, although similar doses of these drugs have been demonstrated to reduce food intake. The results indicate that although sibutramine, naltrexone, and rimonabant all decreased food intake, only sibutramine reduced the discriminative stimuli associated with acute food deprivation.

Rochelle Smits (149)
Faculty Advisor/Collaborator: Jeffrey Goodman
*Perceptions of Altruistic and Criminal Behavior*

There has been a recent resurgence of interest in the psychology of good and evil (Miller, 2005; Staub, 2003). Specifically, social scientists have rekindled examinations of both altruistic and criminal behavior.
Perceptions of altruistic behavior have been found to be moderated by several variables such as monetary cost and genetic relatedness (Swap, 1991). Likewise, the perceived seriousness of a crime is governed by variables such as wrongfulness and impact on the victim. Thus, attribution theory (Kelly, 1967) may account for the findings that the perceived responsibility for an action is determined by the extent to which perceivers believe that dispositional or environmental factors influenced the occurrence of the behavior. A major question remaining is whether assessments of behaviors as altruistic (or antisocial), and as deserving of praise (or punishment), are governed by the same or different attributional variables. The researchers presented participants various vignettes depicting criminal and altruistic behaviors that varied on theoretically identified dispositional and environmental variables on two levels of severity. By presenting criminal and altruistic behaviors in this way the researchers were able to empirically determine similarities and differences in how environmental and dispositional factors affected individuals’ attributions of criminal versus prosocial behaviors.

Rochelle Smits and Matthew Newquist (171)
Faculty Advisor/Collaborator: Daniel Holt
Gambling problems: A Matter of Risk Taking Tendency or Inability to Delay Gratification?

Discounting refers to the fact that the subjective value of a reward decreases as the delay to or odds against receipt increases. Previous research has found that college-aged gamblers were more willing to take risks with monetary outcomes than matched peers (Holt, Green, & Myerson, 2003). The researchers did not find a difference between willingness to delay gratification between the same gambling and non-gambling students. Taken together, these findings suggest that ‘impulse control’ problems do not necessarily include both an inability to delay gratification and a tendency to take risks. Other researchers have posited that pathological gamblers, when making decisions regarding gambling, discount delayed (and probabilistic) losses very steeply and are thus insensitive to the delayed (potential) losses as a result of gambling (Madden, Ewan, & Lagorio, 2007). Both problem gamblers and matched non-gamblers completed both an online computer-based gambling screen and decision-making task in which they made choices between hypothetical monetary rewards (and payments) to be received (and paid) at a range of delays and probabilities. The current study extends previous research to choices involving delayed (and uncertain) monetary losses in attempt to determine the extent to which gamblers discount losses compared to non-gamblers.

Rochelle Smits (172)
Faculty Advisor/Collaborator: Daniel Holt
The Value of Working Compared to Gambling: Are College Students Risk-Takers?

Pathological gambling, labeled a disorder by the American Psychological Association, is responsible for real life maladaptive consequences in over eighteen percent of the U.S. adult population (Gambling Impact and Behavior Study, 1999). Although several studies by economists have evaluated situational factors that correlate with gambling behavior, there have been no models that allow for causal statements regarding the role of specific environmental variables in contributing to the development and maintenance of gambling behavior. The current study utilized a new experimental model of gambling behavior that promotes investigation of the choices many individuals make daily: to gamble or not. In the present study, college students were presented, on a computer monitor, with the option to earn points through ‘working’ (certain, consistent outcomes) or ‘gambling’ (the chance of a gain). The points functioned like money and could be exchanged for goods. In various gambling conditions, the procedure adjusted until the participant chose to work and gamble at equivalent rates. The results shed some light on how college students equate working and gambling and give insight into the relationship between environmental factors (e.g., between income and the odds of success at gambling) that may contribute to the development and maintenance of gambling behavior.
The heritability of religiousness increases over time in samples with little demographic variability (Koenig et al., 2005; Koenig et al., 2008). The present study replicated and extended these findings in a diverse sample in which participants from 18 to 54 years old (mean 22.4) resided in 21 countries. Participants completed an online questionnaire about retrospective and current religiousness for themselves and their co-twins. Monozygotic twins were more similar than dizygotic twins in adulthood, but there was no difference in childhood. Twin pairs who moved from their home environments had a larger religiousness heritability estimate than twin pairs who never moved (.40 vs. 0). I discuss the active gene-environment correlation (niche-seeking) in light of these results.

Can Money Buy Happiness? Evidence from the Discounting of Uncertain Happiness

With probability discounting, the subjective value of an uncertain outcome decreases as a function of increases in the odds against its receipt. Although individuals regularly make choices between non-monetary outcomes (e.g., choosing between food items), relatively little research has been done in this area. The current study investigated choice behavior between certain and uncertain monetary and non-monetary outcomes. We asked undergraduate college students to make a series of choices between uncertain hypothetical outcomes: money and happiness. Specifically, individuals were asked to choose between a monetary outcome (certain) and personal happiness (uncertain). We found that as an individual’s happiness becomes more uncertain they were willing to accept less money. That is, we found that money can ‘buy’ happiness and that the subjective value of happiness decreases (discounting) as the odds against its receipt increases (discounting). We also found that individuals who self-reported being relatively “happy,” as determined by a happiness questionnaire, were not as willing to take a risk with their personal happiness as those individuals who self-reported being “less happy.” While additional data collection and analyses are warranted, the present findings suggest that a fuller understanding of the factors that contribute to choices regarding uncertain non-monetary outcomes is possible.

Age Variation in Mating Strategies and Partner Preferences: Beliefs versus Reality

We conducted three studies to (1) investigate individuals’ beliefs about change in mating desires over the course of emerging adulthood and (2) determine whether those beliefs reflect actual variation in mating desires among emerging adults of varied ages (late teens through twenties). In Study 1, 103 men and women gave their thoughts on how college students change, if at all, in what they most desire in a relationship and relationship partner as they move from being incoming freshmen to graduating seniors. In Studies 2 and 3, using a college sample and then an internet sample (Ns = 288 and 307), men and women between the ages of 18 and 26 completed mating orientation inventories and allotted a limited number of “mate dollars” to 10 mate characteristics. Findings suggest that although emerging adults believe that their peers’ mating desires change systematically over time, emerging adults’ self-reported mating desires vary very little with age.

The Stability of Preferences for Tangible Items in Children Diagnosed with Autism

Results of previous literature suggest that stability of preferences for tangible items varies across individuals. These results suggest that preferences need to be continuously tracked in order to develop skill acquisition programs for individuals with developmental disabilities. Few studies have examined...
preference stability for young children diagnosed with autism. Additionally, few studies have conducted repeated preference assessments with children diagnosed with autism. We extended the literature by conducting frequent multiple-stimulus-without-replacement (MSWO) preference assessments for tangible items with young children diagnosed with autism to determine the stability of preferred items over time.

Julia Wippler, Lyndsay Nelson and Kelsey Michels (262)
Faculty Advisor/Collaborator: April Bleske-Rechek

Easy A or Intellectually Rewarding B? Students’ Perceptions of Teaching and Learning as a Function of Gender, Discipline, and Year in School

Past research on achievement goals and academic performance has shown that students who score high in mastery orientation (learning goals) experience academic success. Scholarship on teaching and learning encourages active learning (e.g., class discussion, small-group interaction) to promote students’ academic success. In the current study, we investigated (1) whether students who score high in learning goals also prefer classroom instructional behaviors that are used to promote active learning, and (2) whether specific student characteristics are associated with holding a strong learning goal orientation. A total of 155 female and 50 male undergraduates completed two achievement goal inventories, responded to trade-off items in which learning and grading were pitted against one another, and reported the extent to which they preferred various instructional strategies. Students did not show consensus in their evaluation of active learning strategies in the classroom, although various student characteristics were associated with a positive evaluation of such strategies. Upperclassmen scored higher in learning goals than did underclassmen. We discuss our findings in the context of college student development and the promotion of lifelong learning.

Sociology

Nathan Gillick (9)
Faculty Advisor/Collaborator: Jeff Erger

Transformation of Relationships Within Online Roleplaying Games

This project examines relationships in Online Roleplaying games, specifically how people transform instrumental relationships (players working together to get better in-game items) into affective relationships (players are friends and having a good time is more important than in-game achievements). Social Identity Theory states that as people spend more time with each other, they will develop a group identity and picture the others in the group much like themselves. Twenty online, first person narratives of play experiences were gathered, totalling approximately 30,000 words each. Qualitative analysis was performed by using NVIVO 8 to code theoretically relevant passages and locate conceptual connections between those parts of the players’ stories relevant to relationships. Initial analysis shows that the amount of time players spend together, the intensity of the interactions (ex: casual chatting versus playing together in long dungeon sessions), and reciprocity in exchanges (doing favors for each other, exchanging items) lead to closer relationships through increased levels of trust. These findings are consistent with Social Identity Theory. As these themes are present in other social contexts, these findings have implications beyond the world of online interactions.

Caryn Ling (10)
Faculty Advisor/Collaborator: Jeff Erger

Effects of Identity Processes on College Student Self Esteem, Self Efficacy, and Satisfaction with College

Major lifestyle changes often have powerful effects on the forming and modification of people’s view of themselves, with college students adjusting to campus life being one example. Identity Theory and Social Identity Theory predict how identity is affected by the roles people perform (Identity Theory) or the groups they belong to (Social Identity Theory). This research assesses how the first semester college experience affects role-based identity and group-based identity, and how identity changes produce changes in self esteem, self efficacy, and overall satisfaction with college. Data was gathered from a two wave survey at
the start of the fall and spring semesters. Regression analysis was performed on the 56 students who responded to both surveys. Analysis indicates that social identity change has a larger effect on self-esteem, self-efficacy, and satisfaction with college than academic identity change.

Hayley Schultz (11)
Faculty Advisor/Collaborator: Kathleen Nybroten

Watching Your Drink: How the Use of Preventative Measures Relates to the Consequences of Drinking

The purpose of this study is to analyze practices and attitudes towards alcohol use among University of Wisconsin-Eau Claire students. The objectives of this project include determining the reasons students drink, identifying factors that moderate students’ alcohol use, learning what protective measures students engage in while drinking, and assessing reported consequences of drinking. In this presentation, we focus on the relationship between the protective measures students engage in while drinking and the negative consequences students suffer as a result of their own drinking.
Biology

Gina Cimafranca (269)
Faculty Advisor/Collaborator: Todd Wellnitz
On the Road with Gina and Miss C.

Evolutionary evidence suggests that our domesticated canines (*Canis lupus familiaris*) evolved from wolves (*Canis lupus*) over 10,000 years ago. The video "Wolves and Dogs" was created to help audience members discover the physiological and behavioral similarities and differences between the two. Footage of wolves was taken at the International Wolf Center where six wolves of three different subspecies reside. These wolves started a socialization process when they were pups, resulting in a tolerance for human presence. This process allows the wolves to display the same behaviors that would be seen in the wild, which is beneficial to both visitors and the mental health of the animals. Wolf ecology and lifestyle is also discussed. Footage of domesticated dogs was taken at The Beastro, a “doggy daycare” located here in Eau Claire, WI. "Wolves and Dogs" is meant to be just one episode out of a fictional television series called On the Road with Gina and Miss C. Both hosts are played by Ms. Cimafranca and show two aspects of my education, with Gina being the biologist and Miss C. being the teacher. The interplay between these characters helps the audience relate to and understand the concepts presented in the video.

Chemistry

Gloria Anderson and Daniel J. Steltz (189)
Faculty Advisor/Collaborator: Bob Eierman
Creativity in Scholarship and Teaching in Various Disciplines

The goal of this project is to compare and contrast how educators in different disciplines think and talk about creativity in their own scholarly work and in their teaching. Three groups of five UW-Eau Claire faculty members each participated in a structured group interview. The first group consisted of members from Arts and Humanities, the second from social sciences and the third from physical sciences. Each group was asked the same set of questions about their personal creativity in scholarship, their student researchers’ creativity, how they address creativity in their teaching and their definition of creativity. The interviews were recorded, have been transcribed and the transcriptions are being analyzed. The results of the analysis will be presented and the hope is to draw conclusions regarding similarities and differences in how educators in different disciplinary areas address creativity in their professional lives.

Communication Sciences and Disorders

Laura Barth and Amy Muller (212)
Faculty Advisor/Collaborator: Kristine Retherford
Strengthening Literacy Skills: A Comparative Analysis of Grammatical Endings in Oral Reading

This descriptive study monitored and compared grammatical endings produced by a 62-year old participant with a hearing impairment during oral reading activities. Two types of reading passages were analyzed, one authored by the participant and one written at a grade-appropriate level. Data was recorded prior to and following a weekly two-hour treatment session. The participant’s responses were analyzed to compare the presence of grammatical markings before, after, and across sessions and to determine potential explanations.
Sara Johnson, Evelyn Atkinson and Danielle Rubens (205)
Faculty Advisor/Collaborator: Jerry Hoepner
The Effects of Word Search Strategies on Self-Esteem in Persons with Aphasia

This study compares the effects of word search strategies on the person with aphasia's (PWA) self-esteem in a familiar and unfamiliar context. Participants were tested in the Center for Communication Disorders using the auditory section of the Western Aphasia Battery to determine severity and type of aphasia. This study included PWAs and their familiar partners (e.g., spouse, friend, family members), and two confederates to take the role of an unfamiliar partner with each dyad. Four conversations were video recorded between PWAs and conversation partners. The Visual Assessment of Self-Esteem Scale was used to determine the self-esteem of the PWA after each conversation. Given Oelschlaegar and Damico’s (2004) results we hypothesized that the self-esteem of the PWA will be affected with each of the four strategies used. Positive self-esteem was predicted to occur from the use of the guess and alternative guess strategies. The completion and closing strategies were predicted to result in negative self-esteem. It was predicted that the PWA’s level of comfort would be higher with familiar versus unfamiliar partners. Results are expected to be useful for the communication partners on how to best facilitate their partners' social competency.

Curriculum and Instruction

Jessica Fanetti (203)
Faculty Advisor/Collaborator: Sherry Macaul
Integrating New Technologies into the Reading Methods Classes

This qualitative research study examined undergraduate student perceptions and technology implementation in classrooms during a 4-week literacy methods practicum, held in both the fall and spring semesters 2008-2009. Through pre/post surveys and teacher interview and observation forms, this study was designed to encourage and support students as they created a technology-based lesson plan for their reading/language arts classrooms. Students were provided with a list of possible technology applications and an optional conference time, which guided them in incorporating the technology they selected. During an initial one-week observation period in the schools, students were also required to complete a teacher interview and observation form. At the end of the practicum experience students were required to share their technology lesson plan, as well as create a guide sheet for the specific technology they implemented. The resources collected from students at the end of each semester will be shared with future classes and used to enhance and extend student knowledge of the most recent literacy and technology applications. The findings of this study will be useful to literacy methods faculty in planning courses and practicum experiences, and will also encourage faculty and undergraduate students to discover and implement new and emerging technologies.

Beth Fugina (214)
Faculty Advisor/Collaborator: Robert Hollon
Middle School Students’ Conceptions of Leaders and Leadership

Past research has examined leadership development for teachers and administrators, and how school leadership affects school climate and student achievement. However, researchers seldom examine the nature of students’ thinking about themselves as leaders. This research examined the conceptions of leaders and leadership held by seventh graders in three schools in the Eau Claire area. Thirty-four seventh graders completed clinical interviews which combined analysis of everyday situations and general questions about characteristics of leaders. Data were analyzed using a constant comparative methodology. Seventh graders most frequently described a leader as a group-oriented person who does not have to be placed in charge of a task. Leaders look out for others, are honest, confident, and good listeners who are willing to change their mind. Leaders take action by choosing to help others succeed, and modeling good decision-making. Comparison of responses to general and everyday questions suggests some awareness that leadership is situational. Students perceived themselves as leaders only
in settings where they were confident that they already had knowledge and experience. Students seldom recognize that learning experiences (in and out of school) offer opportunities to develop leadership skills and would benefit from leadership development as an explicit curriculum theme.

**Pa Sia Moua (204)**  
Faculty Advisor/Collaborator: Tamara Lindsey  
*Strengthening Literacy Skills: Readers Theater and Memoir*

This project focuses on strengthening the fluency rates of adult readers by employing two important literacy strategies—performative readers theater and personal memoir in response to photographs. Martinez, Roser, and Strecker (1998) tell us that the students in their study made remarkable reading gains when they became involved with weekly readers theater performances, oral activities that improved the student’s reading rate, accuracy, phrasing, and expression. Re-reading is most likely one of the key elements in helping any learner improve literacy abilities (Routman, Allington and Cunningham, Beers) and preparing for a presentation for others provides a genuine impetus and motivation for essential continuous and painstaking practice. Because writing is the most complex of all literacy skills, it is often ignored as a vital companion to the teaching and learning of reading. We follow Van Horn's (2008) advice that photographs serve as a, “... powerful inspiration for writing and literacy.” We ask our participants to respond in writing to photographs. Then these narratives not only serve as the impetus for sharing lived experiences, but they also provide resources for creating personalized readers theater scripts.

**Florence Pattee (213)**  
Faculty Advisor/Collaborator: Deb Pattee  
*Enhancing Middle School Interdisciplinary Teaching with Museum Resources*

The Curriculum and Instruction Department in the UWEC College of Education and Human Sciences and the Chippewa Valley Museum (CVM), an accredited regional history museum in Eau Claire, collaborated in order to encourage pre-service and in-service teachers to use the resources of the CVM to enhance teaching in content areas such as mathematics, art, science, language arts and music. These content areas often do not realize that a history museum has resources which teachers in these content areas can use in their lesson planning. One of the goals of this project was to present a sampling of the resources available within the CVM for these content areas. One student, Florence Pattee, worked with the CVM staff to research and analyze the museum’s resources for understanding post-1970’s immigration, migration and cultural diversity among the Hmong, Amish, Somali, and Latino populations in Wisconsin. The final product was an interdisciplinary guide, in the form of a pamphlet, to the museum’s resources for teachers.

**Foreign Languages**

**Kaitlyn Hellenbrand (180)**  
Faculty Advisor/Collaborator: Anne Hlas  
*An Investigation of World Language Teaching Methodologies and Language Usage in the Classroom: Phase 2*

This project is a continuation of a study completed a year ago that answered these questions: Who are the Spanish teachers in Wisconsin? When do Spanish teachers switch from speaking Spanish to speaking English? Why do they decide to do so? The previous study focused primarily on the relationship between content and language usage in the classroom with quantitative data collected from online surveys. This study used the qualitative responses from the online surveys, in addition to interviews and observations of Spanish teachers in the Eau Claire area. From this data, researchers determined fifteen different categories that explained the teachers’ use of English in the classroom. Researchers then applied these findings to create strategies to combat code-switching in the classroom,
which they presented at Wisconsin Association of Foreign Language Teachers 2008.

Astri Mikkelson (181)
Faculty Advisor/Collaborator: Jessica Miller
An Investigation of Techniques for Teaching Pronunciation in a College-Level Beginner French Course

The use of phonetics in teaching French to adult beginning language learners is a controversial technique. Critics of early phonetic instruction include Diane Dansereau, who suggests that learning the phonetic alphabet and French language simultaneously would be too confusing. Her preferred alternative for teaching pronunciation is using familiar words for sound comparison. We hypothesized, however, that the visual support provided by phonetics may enable students to better distinguish pronunciation differences in French, and thereby establish a foundation for correct pronunciation as they continue their study of the language. We collected data in a college-level beginner French course over the course of a semester to evaluate the results of pronunciation instruction that employed and that did not employ phonetics. The results favored the word-comparison technique at the beginning of the semester, but performance differences were not substantial at the end of the semester. A number of variables also are taken into account in our analysis of the results. This poster will display our completed experiment, including the design specifics, results, and plans for continuing research.

Health Care Administration

Micah Herold (227)
Faculty Advisor/Collaborator: Douglas Olson
Long Term Care Leadership

Researchers have not yet measured how the critical long term care (LTC) health care leaders (the director of nursing, administrator, medical director, and pharmacy consultant) feel about their own roles within the context of their own work and how they collaborate and work as a team. The main purpose of this study is to analyze how the quality of the LTC facility is affected by how the four key leaders perceive their job roles and work together as a team. The survey focuses on key related aspects of leadership. These include facility-wide engagement, resident care, workforce focus, quality systems, personal and collaborative leadership, and financial and resource accountability. The effective operation of an LTC organization is critically dependent upon leaders’ self-perception of their individual role as well as the team perception of how each leader contributed to the collaborative effort. This national study examines how much quality is enhanced when all the LTC leaders in a nursing facility understand and live up to their role as a leader. Methods include pilot testing the survey and making final revisions. Our anticipated results are that the quality of a long-term care facility will be improved when all four key leaders work collaboratively as a team.

Information Systems

Tricia Arifin and Ravshan Yakubov (238)
Faculty Advisor/Collaborator: Jean Pratt
Outsourcing and Offshoring: An International Perspective

Background and Rationale: Companies are choosing Ireland as their prime destination for outsourcing and offshoring due to many favorable factors such as time zone and availability of quality labor. Personnel at offshoring facilities in Ireland were surveyed to identify critical success factors related to the partnership between the offshored facility and the host company. Methods: An online survey and interviews of personnel at offshored facilities in Limerick and Dublin, Ireland. The survey template was adapted from Lee and Kim’s (2005) research study and was based primarily on two theories: (1) Behavioral-Attitudinal Theory and (2) Theory of Reasoned Action. Mixed results from the pilot study survey formed the basis for the personal interviews administered in Ireland. Results and Conclusions:
(Research in progress) The recent economic downturn necessitates a solid understanding of critical success factors for offshoring ventures. Personal interviews should provide added insight into the critical success factors from the perspective of personnel employed at offshoring facilities. [For example, Dell Computer was significantly downsizing its offshoring facility in Limerick at the time of our interviews.]

Yan Lam (228)
Faculty Advisor/Collaborator: Bruce Lo
The Public Face of International E-Business

The Internet has expanded and become a key component in business since the 1990s. Under the trend of globalization, international corporations constantly craft various marketing strategies in e-business to reach and attract more national and international customers from different countries. Localization and standardization are the two major approaches that are widely used by businesses to meet the global market needs. By examining 153 homepages of 12 global companies in 17 different countries, this study is aimed at understanding how these two approaches are implemented in the design of companies’ Web sites, especially the appearance, content, and interactivity. The initial investigation shows that companies from the same industry generally use a similar approach in designing their homepages. For example, the fast food companies often include localized components, e.g. graphic, navigation menu, and white space in their Web sites for different countries. On the other hand, the social networking companies use mostly a standardized approach in organizing their Web sites among different regions. The observation results conclude that the business model of a site has a stronger determination on Web site features rather than cultural or regional localization factors.

Kinesiology

Abby Germer, Sara Hopp, Nora Kehl and Jessica Mayer (249)
Faculty Advisor/Collaborator: Lance Dalleck
The Prevalence of Metabolic Syndrome in Predominately Caucasian College-Aged Students

The authors collected healthy history information and components of the Metabolic Syndrome (MetS) data in 207 college students aged 18 to 24 years. The objective of the study was to quantify the prevalence of MetS among college students on our campus and to determine whether fatness (body mass index and waist circumference) or physical activity was more strongly associated with individual components of the MetS. The prevalence of MetS in our sample was found to be 6.8% according to the National Cholesterol Education Program Adult Treatment Panel III guidelines. We also found 42.5% and 13.0% of our sample had one and two MetS components, respectively. Waist circumference was independently associated (p < 0.05) with high density lipoprotein cholesterol, triglycerides, and systolic blood pressure. Our findings provide evidence for the presence of MetS on college campuses. It also appears, in part, that central adiposity contributes to the high incidence of individual MetS components.

Kyle Gibson, Corey O'Brien and Kate Stuewe (239)
Faculty Advisor/Collaborator: Robert Stow
The Efficacy in Predicting Risk of Injury in Collegiate Basketball Players: Functional Movement Screen vs. Traditional Pre-Participation Examination.

Purpose: 1) To determine if there were differences between the traditional pre-participation examination (PPE) and the functional movement screen (FMS) in the number of athletes cleared and 2) to determine if pre-season FMS score is associated with an increased risk of injury. Methods: Subjects included men and women Division III basketball athletes. Each athlete performed the FMS test and was scored on his or her ability to complete each exercise. The FMS is an evaluation of an athletes' stability and mobility through seven fundamental movements. We used Kiesel et al. (2007) findings that a FMS score of 14 or below positively predicts serious injury. Results: There were 9 out of 21 (43%) subjects that failed the FMS (scored 14 or below) in the study. The standard PPE passed all twenty one (100%) subjects. We are tracking the athletes' injuries and will do so throughout the season. The statistics will be available
prior to the presentation day. Conclusion: We believe that there will be a higher prevalence of injuries in those individuals who scored 14 or below on the pre-season FMS. The FMS would be advantageous to those in the sports medicine community for improving injury prevention.

Scott Miller, Carlye Garcia and Josh Holforty (250)
Faculty Advisor/Collaborator: Lance Dalleck

Effect of Acute Chloramine Exposure on Pulmonary Function Test and Maximal Oxygen Uptake

Purpose: Research has shown that there is a strong correlation between chloramines exposure and pulmonary dysfunction. The purpose of our study is to determine if acute exposure to chloramines will have an effect on athletic performance using Maximal Oxygen Uptake (VO2 Max) and Pulmonary Function (PFT) tests as predictors of athletic performance. Methods: Subjects were non-smoking, age 18 - 25. Subjects had no previously diagnosed respiratory disorders and were recreationally active. Subjects also had previously participated in PFT and VO2 Max tests. Independent variables were chloramines rich environment and non-chloramines rich environment. Dependent variables were FVC, FEV1, MVV and VO2 Peak. Results: A two-tailed paired t-test was used to distinguish significance. Statistical significance was based on p ≤ 0.05. VO2 Peak was higher in the non-chloramines rich environment. Pulmonary Function Testing baseline and post variables showed no significance between the environments. Conclusion: Results showed that exercising in a chloramines rich environment can have a negative effect on lung function. This research will help to further ensure that pool facilities are properly ventilated/maintained so that athletes can reach their performance potential.

Allison Smith, Jessica Tischendorf, Cassie Peeters and Emily Haese (240)
Faculty Advisor/Collaborator: Lance Dalleck

Effects of Acute Bouts of Static and Dynamic Stretching on Balance Performance in Older Adults

Purpose: This study examined the effects of an acute bout of static and dynamic stretching on balance performance in older adults. Methods: Participants in this study included 9 males and 6 females, aged 66.1±8.1 (mean±SD) all age 50 or older, who were participating in a regular physical activity program at the time of testing and had varying amounts of exposure to balance training. Balance was assessed using the Fullerton Advanced Balance Scale (FABS) after completing a rest, static and dynamic stretching intervention, on three separate occasions. Results: We found no differences in FABS performance between any experimental treatments. Conclusion: These results suggest the ordering of flexibility and balance training does not pose an increased risk of falls in older adults within an exercise program.

Jessica Tischendorf (225)
Faculty Advisor/Collaborator: Lance Dalleck

Evidence-Based Practice: Improving Health Outcomes in a Community-Based Fitness Program through the Application of Current Research Findings

Purpose: The purpose of this analysis was to evaluate the effectiveness of prescribing exercise based on an evidence-based practice approach in a community setting. Methods: Subjects included 238 men (N = 101) and women (N = 137), with a mean age of 62.4 yrs enrolled in a community-based exercise program from fall 2005 to spring 2008. The exercise program was 14 wk in duration, with 80 % attendance. Mean intensity was 42.3% Heart Rate Reserve (range = 26-76% HRR), and goal energy expenditure range was 14-23 kcal/kg/week. Results: Meaningful improvements (p < 0.05) occurred in waist circumference (-1.5%), body mass (-0.75%), body mass index (-1.0%), relative aerobic fitness (+12.9%), systolic blood pressure (-4.1%) and diastolic blood pressure (-2.0%). Positive alterations (p < 0.05) in blood lipids and glucose were also demonstrated: 8.4% increase in HDL, 16.0% decrease in triglycerides, and 7.6% decrease in fasting blood glucose. Conclusion: Many of the health outcomes demonstrated by this community-based exercise program are comparable to those reported in recent, randomized exercise interventions (Kraus et al., 2002). In summary, our findings suggest there is a dose-response relationship between exercise amount (total energy expenditure) and cardiorespiratory fitness, lipid parameters, body mass and anthropometric measures, and insulin sensitivity.
Brian Vetterkind, Amanda Kimmins, Amanda Ekholm and Paula Schommer (275)
Faculty Advisor/Collaborator: Donald Bredle
Effects of Body Composition, Calorie Intake, and Energy Expenditure on Resting Metabolic Rate

Resting Metabolic Rate (RMR) reveals how many calories are burned daily before considering any movement. Since RMR typically accounts for the largest proportion of daily energy expenditure, it is an important variable to quantify in anyone trying to control bodyweight. This research project will focus on various correlations of body composition with RMR. One hypothesis was that leaner individuals will have higher RMR values. College students, age 18-26 (n=10 to date) were measured early in the morning after an overnight fast. After resting quietly in a reclining chair for 30 minutes, subjects breathed into a Cosmed oxygen analyzer via a comfortable facemask for 15-20 minutes. The oxygen uptake of the final 10 minutes was averaged and converted to calories burned and then expressed per 24 hour period. This measured RMR was then correlated with weight, body fat percent (measured via skinfolds and underwater weighing), and lean body mass (calculated as total weight minus fat weight). When leanness was expressed by bodyfat percent, there was a weak negative correlation with RMR (r=-0.55, p=0.10). Surprisingly, even body weight alone had a better correlation than fat % with RMR (r=0.77, p=0.009). Lean body mass provided the best correlation with RMR (r=0.85, p=0.002).

Management and Marketing

Sook Jen Chan (270)
Faculty Advisor/Collaborator: Rama Yelkur
Replicating and Validating the Affinity Scale in a Cross-National Context: Testing the Scale in Malaysia

This study is aimed at measuring consumers' positive sentiments towards certain countries and the consequences for marketing. A new scale called “Affinity” was developed to measure such sentiments. “Affinity” is defined as the affection or fondness for a given country and can be attributed to a variety of reasons such as heritage/culture, climate, people, and travel. The preliminary testing of the scale was conducted predominantly in countries with large immigrant populations such as the U.S. and Norway. However, in order to validate and generalize the scale, it needs to be tested in a variety of continents and in countries with and without immigrant populations. For this reason, the Affinity scale and Affinity model that measures the impact of Affinity on other variables such as buying intentions and product judgments was developed and tested in Malaysia. The primary intent of the study was to measure Malaysian consumers’ attitudes towards United States and the consequent behavioral implications. The United States was the country presented to Malaysian respondents because research indicates that citizens of Malaysia have a “liking” or Affinity towards the United States. The model is tested, results presented and implications are discussed for U.S. companies marketing in Malaysia.

Tarrah Irussi (253)
Faculty Advisor/Collaborator: Rhetta Standifer
The Impact of Temporal Diversity upon Team Process and Team Effectiveness: A Cross-Cultural Perspective

This study represents the next step in a series of studies exploring the relationship between temporal diversity, temporal and non-temporal team processes, and team effectiveness. Our first study was conducted domestically using student teams from the College of Business. The current study extends the conceptual model to a multicultural context. Data is being collected through collaborations with colleagues from universities in Portugal, the Netherlands, and Germany. With this information, my contribution to the project will be to create the cultural profiles, outline how I think our current hypotheses will apply to those cultures, and come up with new hypotheses suggesting how the model will work in these cultures. Existing hypotheses outline the way in which temporal variables affect team processes and team effectiveness. In the domestic study, individual-level temporal variables did not appear to affect team processes and effectiveness when aggregated to the team level. However, shared temporal cognitions and shared temporal reminders did affect other team processes and team effectiveness. The comparison
of the results across all of these cultures will not be completed until the spring of 2010.

Dan Rozumalski (236)
Faculty Advisor/Collaborator: Rama Yelkur

Super Bowl Ad Likeability and Stock Performance of Advertisers: A Longitudinal Analysis of the Relationship and Trends

In this study, stock price performance of Super Bowl advertisers is the dependent variable of interest. Ad likeability, industry type, and advertiser experience were the independent variables examined. Stock price changes were analyzed for both the day after the event and for the two-week period encompassing the event. Industry type was found to be related to stock price performance the day after the game. Advertiser experience was found to be negatively related to stock performance for the two-week period. No relationship was found between ad likeability and stock performance. Implications for investors, advertisers and researchers are provided.

Dan Rozumalski (237)
Faculty Advisor/Collaborator: Rama Yelkur

Twenty Years of Super Bowl Ad Likeability (1989-2008): A Predictive Model

Ads appearing during the Super Bowl contain an element and level of likeability unparalleled to ordinary primetime and daily spots. With the cost of a 30-second ad averaging $2.7 million in 2008, there has been an increasing interest in this mega event. A 2001 study by Tomkovick, Yelkur and Christians predicted Super Bowl ad likeability using merely the presence or absence of five factors. This poster assists in predicting ad likeability more thoroughly and over an expanded period of time (1989-2008). With the help of a student panel, we have examined and coded nine predictors of ad likeability on a 5-point scale and run a regression analysis to test for the effect of these factors on ad likeability. Results and implications are shown.

Mathematics

Mark Lefeber (226)
Faculty Advisor/Collaborator: Chris Hlas

Comparison of Instructional Materials for Solving a Complex Task: The Rubik’s Cube

Research participants were given two sets of written directions for solving Rubik’s Cubes; one version was step-by-step and one version heuristic. Participants were from four eighth grade classrooms, with each class being given an even split of the two sets of directions. As students completed steps they raised their hands and the research staff would initial a record sheet. The results showed that the step-by-step method was more effective at explaining how to solve the Rubik’s Cube.

Oakley Moser and Mari Orendorff (190)
Faculty Advisor/Collaborator: Kate Masarik

Students’ Approaches to Solving Proportional Problems

Proportional reasoning is the foundation for algebra and further mathematics. There is an alarming deficiency in middle and early high school students’ proportional reasoning abilities. Our research project focused on trying to determine how students attempt to understand proportional reasoning. We created and administered a series of proportional word problems to students in grades six through nine. Students responded to these problems using various strategies, which we categorized. We found that several factors, such as students’ past experience and the context of the problem, might influence how students understand and respond to proportional problems.
Music and Theatre Arts

Megan Hoffman and Hana Dehtiar (252)
Faculty Advisor/Collaborator: Lee Anna Rasar
Diversity Infusion and Assessment for Clinical Applications of Percussion Techniques

This presentation will evaluate the effectiveness of different teaching structures used for presentation, homework, testing, and performance venues on content and organization of session plans, session critiques and reflection papers used in Clinical Applications of Percussion Techniques. Areas in comparative analysis include: focus on therapeutic goal, pacing plan for session reflective of ability level of clients, flexibility in back-up plans to meet anticipated needs (ranging from non-responsiveness to hyperactivity), and therapeutic flow in progression of activities. The presentation will compare content of reflection papers when students chose their own models of activities with content in reflection papers when models were chosen from Gardner's Multiple Intelligences work or from Neurologic Music Therapy techniques. Areas assessed include variety of techniques presented for the class, comparison and contrast of different approaches/methodology, performance comparisons of clients with respect to behavioral needs across the different approaches, performance comparisons of clients with respect to physical needs across the different approaches, performance comparisons of clients with respect to cognitive status of clients across the different approaches, emotional responses of clients across the different approaches and across different settings, and social responses of clients across the different approaches and across different settings.

Jennifer Morvak and Hana Dehtiar (251)
Faculty Advisor/Collaborator: Lee Anna Rasar
Effects of Harmonica Playing on Pulmonary Rehabilitation Status

This research project is designed to examine the effect of harmonica playing on inspiratory force, expiratory force, peak flow, and total lung volume based on past research, including previous grants in which playing harmonica statistically significantly affected these four measures and was equally or more effective than using an incentive spirometer. Measures of pulmonary function prior to learning to play harmonica are being used for patients in the Pulmonary Rehabilitation Programs at Luther Hospital and at Sacred Heart Hospital. Each patient has specific measures which have already been taken and these measures vary from patient to patient. The medical records of each patient are being used to replicate measures post-harmonica project and to compare those measures with the data taken immediately prior to beginning this project. Any correlations with specific pulmonary disorders and effects in the measures are noted. The method of using exhale and inhale functions when playing harmonica by reading color-coded notation to indicate when to exhale and when to inhale based on the chordal harmonic structure of songs was most effective and is used in the protocol for the measurement period of the project. Harmonicas were supplied to the patients by Luther and Sacred Heart Hospitals.

Katie Rydlund and Anthony Schuh (271)
Faculty Advisor/Collaborator: Lee Anna Rasar
Database for Music Therapy Research: Populations, Settings, Programming Arenas and More

This project involved creation of new sections for a music therapy database and reorganization of existing sections to include updated research. The database includes populations, therapeutic programming arenas, and topic-specific sections which present research findings along with goals, methodology, and bibliographical citations with and without annotations. This database is used to pinpoint specifically how music affects the brain to create therapeutic effects in motor, cognitive, language, and social/emotional/spiritual functioning. It serves physicians, health care professionals, neurological researchers, educators, students, people with a variety of special needs and their significant others, and the general public as an informational database. The database has previously won the Study Web award as one of the best educational resources on the web. User-friendly tools were incorporated to expedite searches and make multiple sections visible. Cross-referencing was used to help locate information.
Areas included in programming arenas are anger management, infant stimulation, dance and movement, percussion techniques, technology, and special education standards. Areas included in the section for populations and settings include addictions, birth, infants, children, geriatrics, hospice and bereavement, language, learning and behavior, nursing and music, psychological, physical medicine, special education (adaptive education), and wellness.

Ashley Singer (191)
Faculty Advisor/Collaborator: Christa Garvey
Creating and Maintaining Chamber Music Programs in High School

The purpose of this research was to investigate the varied elements and characteristics of chamber music programs throughout the nation to try to determine what elements the programs might have in common. Specifically, our research sought to answer the following question: what policies and procedures do high school band directors include in their chamber music program? Our project looks at the commonalities among groups to determine what elements might make up a successful chamber ensemble program in a high school.

Allison Wells, Lauren Tompkins, Holly Shattuck and Tara Metcalf (274)
Faculty Advisor/Collaborator: Mitra Sadeghpour
The Development of an Opera Education Program: Opera-tunities

Many young singers begin their collegiate musical studies with little or no exposure to opera and scant knowledge of the skills and training required for a career in vocal performance. The goal of our project was to create and implement lesson plans for a series of six after-school workshops that introduced high school students to such topics as operatic literature, stage movement, character creation, language, poetry, and auditioning skills. Our research team studied the educational programs of regional opera companies to use as models for our curriculum. We also surveyed voice faculty at several universities to find out what skills are most often lacking in young performance students. Each team member then devised one hour-long workshop addressing one of these areas. As part of the series, the high school students also attended the senior degree recital of one of the student researchers. The final workshop included the students' participation in the performance of a musical scene. Upon the completion of the pilot run of the workshop series in April 2009, the lesson plans will be compiled as a curriculum guide and distributed to area high school teachers to use in their own classrooms.

Kathleen Henderson (179)
Faculty Advisor/Collaborator: Rita Sperstad
Measurement of Cultural Competence Among Baccalaureate Nursing Students

Cultural competency is an essential skill for professional nurses. Therefore, the higher education accrediting bodies of universities and colleges of nursing are evaluating curricular programs for cultural inclusiveness, cultural competence and cultural awareness. The College of Nursing and Health Sciences offers nursing students the opportunity for various clinical cultural immersion experiences. Some nursing faculty have conducted research with their clinical groups to measure outcomes of cultural competence, while various tools and methods have been used. The purpose of this research has been identified as Phase I of a multi layered project. The goal of Phase I was to have a tool to measure the cultural competence of the baccalaureate nursing student. A review of the results from UWEC nursing immersion experiences and tools used was done. Also a review of literature for current tools to measure cultural competence in the baccalaureate nursing student was done. This effort revealed that there is a dearth of tools that specifically focus on measuring the cultural competence of the baccalaureate nursing student. Therefore, the final outcome of Phase I in this faculty/student research project was the development of an adapted tool to measure cultural competence in the baccalaureate nursing student.
Heather Nichols, Emily Skurla, Allison Quinn and Phil Seep (166)
Faculty Advisor/Collaborator: Cheryl Lapp
War and its Aftermath: A Study of Nurses who have Served in Iraq and Afghanistan.

The project explores, describes, and seeks to understand nursing when it is practiced in combat or near-combat settings. Of particular focus is the examination of the nurses’ post war issues of re-entry into civilian life and how this process is experienced after recent service in the Middle East. The research team uses analysis of qualitative data to learn about the experience of nursing in the military, and to determine if there are self-identified health implications for the nurses as a result of their experiences. The data is compiled from 15-20 nurse participants, interviewed once they have returned to the United States. An open ended, semi-structured interview guide was developed by the research team to explore several dimensions of the experience, including its preparation and any adjustment needs encountered by the nurses and their families upon their return. All researchers participated in the data collection and in the data analysis activities. The researchers will examine whether the needs of the returning military nurses today are being effectively supported. Findings related to the nurses’ direct experiences of adjustment and resilience will be shared.

Physics and Astronomy

Amy Raplinger (188)
Faculty Advisor/Collaborator: Matt Evans
Do Clickers Make a Difference?

Since their introduction, Student Response Systems have been hailed as a novel way of engaging students in large classrooms. While our previous research has upheld this argument, we recently conducted an experiment comparing two classes—one with clickers and one asking the same multiple choice questions but without clickers. Our results showed that, with equal preparation opportunities, the two classes performed similarly on exams regardless of teaching method, leading us to conclude that clickers are not necessary for engaged learning. Our results are discussed here along with the real benefits of having clickers from the perspective of both the students and the instructor.

Social Work

Miranda Hotter (155)
Faculty Advisor/Collaborator: Kriss Kevorkian
Colorado and Wisconsin Nursing Home Sexual Intimacy Policies: Ready for the Baby Boomers?

This paper examines policies regarding sexual activity and intimacy in selected nursing homes and care centers in southern CO and northwest WI. Seven million “Boomers” will soon enter the elder care network; it is important to see whether or not care-giving facilities are prepared for their intimacy needs. Literature review suggests this topic has been discussed since the 1970s with no solutions until recent years. Studies show that if more attention is paid to nursing home residents that perhaps they will not require sexual activities but intimacy. There is one nursing home in New York that has taken the lead in offering support and nurturing sexual intimacy needs of residents while staff offer more individual time with each resident. Findings include that nursing homes in Wisconsin and Colorado do not offer policies or training for staff regarding this issue.
Special Education

Andrea Guyant (215)
Faculty Advisor/Collaborator: Todd Stephens
A Survey on Attitudes & Perceptions of People with Disabilities

This descriptive pilot study sought to gather insight into people’s attitudes and perceptions of people with disabilities. The study was conducted via an online survey entitled People with Disabilities. The survey consisted of twenty-four questions in varying forms: attribute selection, rating scales, descriptive word selection and open-ended response. The target population included students, alumni, classified staff members and faculty/academic staff members associated with the University of Wisconsin-Eau Claire. The survey response rate was 26% which was within the range of sufficient response rates for an online survey. The findings show that respondent attributes including gender, age, association with UW-Eau Claire and highest degree earned, did appear to relate to the attitudes and perceptions of people with disabilities as found in the differences of participant responses. Furthermore, the findings show that a greater percentage of the participant population selected words associated with positive attributes to best describe people with disabilities. Finally, participants provided open-ended responses regarding the factors that have contributed to his or her attitudes towards people with disabilities and the development of his or her opinions of people with disabilities.

Student Affairs

Janna Caspersen, Sarah Gonzalez and Anthony Och (178)
Faculty Advisor/Collaborator: Jodi Thesing-Ritter
Civil Rights Pilgrimage - An Evaluation Study of the Impact of an Immersion Experience on the Development of Multicultural Competence at UW-Eau Claire

The Civil Rights Pilgrimage is an evaluation study of the impact of immersion experiences on the development of multicultural competence at University of Wisconsin-Eau Claire. Research was conducted by distributing a survey before the trip to test previous knowledge of the Civil Rights Movement; this survey also included the Modern Racism Scale, testing the participant's level of racist beliefs and personal holdings. When the trip was completed the students were given the exact same survey, with satisfaction questions added. With the variations in participants’ responses we, as a research team, were able to evaluate the changes in knowledge of the Civil Rights Movement and in the individual’s racist attitudes. We are using both thewinterm and the spring break trips as our sample; thus we do not have our data completely collected. However the data we have collected from the winterm trip shows an immense change in knowledge and racist attitudes. Their answers to the knowledge based questions were accurate and insightful. Their answers to the modern racism scale show vast improvement toward acceptance of diverse peoples and cultures. The participants developed a progressive notion of diversity today from looking at in the past, present, and future.
Natural and Physical Sciences

Biology

Andrew Anhalt (211)
Faculty Advisor/Collaborator: Derek Gingerich
Analysis of Evolution of BTB Genes through the Chlamydomonas Genome

BTB genes encode proteins that act as target adapters in BTB-CUL3 E3 ubiquitin-ligase complexes. These complexes target proteins for degradation by linking them to ubiquitin. The BTB gene families are large and complex in multicellular eukaryotes. The types of BTB proteins encoded in plant and animal genomes are quite different, suggesting that the BTB families have evolved to target very different sets of proteins for degradation in the two groups. As higher plants are believed to have emerged from the green algae, analysis of the BTB gene family from the unicellular alga *Chlamydomonas reinhardtii* will allow us to better understand the evolution of these genes. Known BTB domains were used as queries in BLAST (Basic Local Alignment Search Tool) searches of the *Chlamydomonas* genome sequence. This produced a list of 31 genes which encode putative BTB proteins. Domain structure prediction shows that BTB domains are attached to a variety of protein-protein interaction motifs in *Chlamydomonas*, suggesting a range of target proteins. Interestingly, some *Chlamydomonas* BTB proteins are similar to those found in plants, while others are similar to animal BTBs, suggesting that the *Chlamydomonas* BTB family represents an intermediate step in the divergence of the plant and animal BTB families.

Brandon Blaisdell (206)
Faculty Advisor/Collaborator: Derek Gingerich
Determining the Roles of the BTB Genes At2g04740, At4g08455, At1g04390, At2g30600 in Arabidopsis thaliana Growth and Development

BTB proteins act as target adapters for selective protein degradation by the ubiquitin/26S proteasome pathway. There are 80 BTB proteins encoded in the genome of the model dicot *Arabidopsis thaliana*. In most cases, there are multiple genes in the BTB superfamily which encode similar types of BTB proteins. Thus disruption of a single BTB gene (and its encoded protein) usually does not significantly alter plant growth and development, as similar BTB proteins are able to assume that function. Here we report analysis of four genes (At2g04740, At4g08455, At1g04390, and At2g30600) in the superfamily that encode for BTB proteins that are unique. We are using PCR and DNA gel electrophoresis-based genotyping to identify plants with T-DNA disruptions of these genes, to determine their roles in the plant. We have completed analysis for two of the genes. We have identified individuals with the At2g04740 coding region disrupted, but found that the putative T-DNA insertions in the At2g30600 gene are actually located outside of that gene’s coding sequence (and thus may not disrupt gene function). Initial observations of these lines under standard growth conditions have not identified any obvious aberrations in growth and development.

Benjamin Bonis (160)
Faculty Advisor/Collaborator: Lloyd Turtinen
Development of a Real Time Polymerase Chain Reaction Assay to Detect the Causative Agent of Lyme Disease

The tick-borne pathogen *Borrelia burgdorferi*, causative agent of Lyme disease, causes significant morbidity in the surrounding region. Current diagnosis of this disease is reliant on either physical identification of patient symptoms, or the detection of antibodies specific to *Borrelia*. The purpose of this study is to design and optimize a diagnostic assay to detect presence of *B. burgdorferi* in ticks utilizing real-time polymerase chain reaction (RT-PCR) amplification of the bacterial recA chromosomal gene. Knowledge of the infectivity status of the suspect tick would aid in diagnosis of patients suspected to have been infected, but may not yet be showing outward symptoms. A detection limit of 125 copies of purified...
B. burgdorferi DNA was achieved under optimized conditions. Currently, isolation of B. burgdorferi DNA from tick vectors is being optimized through a variety of methods from ammonium hydroxide extraction to zirconium bead beating and will be further discussed.

Crysta Colangelo and Katya Voelker (187)
Faculty Advisor/Collaborator: Jamie Lyman Gingerich
Characterization of cil-5(my13), a Gene Affecting Cilia Structure and Function in Caenorhabditis elegans

Cilia are cellular organelles that regulate cell development and behaviors in response to changes in the external environment. In mammals, defects in cilia result in a range of disorders, including polycystic kidney disease. In the nematode, C. elegans, only a subset of neurons contain cilia, however genes critical for cilia function are conserved between C. elegans and humans. Thus, C. elegans is a good model for understanding cilia function. The my13 mutation in cil-5 was identified in a forward genetic screen for genes affecting C. elegans' cilia form and function. Homozygous recessive my13 mutants display defects in ciliogenesis and some sensory behaviors regulated by cilia. Dye filling, a method of assessing structural integrity of some neurons, shows the my13 mutation causes defects in tail, but not head, neurons. This result suggests that cil-5 may play an important role in cell-type specification of cilia. Using classical phenotype and SNP mapping, we have narrowed the location of the my13 mutation to a 6cM region on chromosome III. Future plans include additional behavioral assays to identify affected neurons and further refinement of the chromosome region containing the my13 mutation to identify candidate genes.

Matthew Faust and Jeremy Carlson (266)
Faculty Advisor/Collaborator: Todd Wellnitz and William Hintz
Environmental Factors Affecting the Functional Composition and Diversity of Montane Benthic Macroinvertebrate Communities

Predicting benthic macroinvertebrate distributions in streams is difficult because of the dynamic environment and the diverse functional roles assumed by species within the same taxonomic grouping. Recently, a trait-based approach has emerged that allows comparisons of macroinvertebrates by functional traits rather than their taxonomic affiliation. This study explores correlations between community functional trait composition and environmental factors in streams. Specifically, we examined how functional trait composition and diversity changed along gradients of benthic current, stream depth, and substrate size. Thirty Surber samples were taken from Copper Creek, a montane stream flowing through the Rocky Mountain Biological Laboratory in Gothic, Colorado. Collected macroinvertebrates were identified to species and standard length was measured. Other functional species traits were assigned using the classification scheme in Poff et al. 2006. Functional composition was not strongly correlated with a single environmental factor, however all three environmental factors -- current, depth, and substrate -- significantly influenced benthic macroinvertebrate trait composition. Furthermore, diversity increased with increasing heterogeneity, which was quantified by combining benthic current, depth and substrate size into a single latent variable. By studying how multiple environmental factors influence trait composition, we hope to advance the understanding of community structure and function across natural gradients.

Yaron Fireizen (208)
Faculty Advisor/Collaborator: Julie Anderson
Isolation and Characterization of Regulators of Oxidative Stress-Induced Apoptosis in Yeast

This project is a long-term project aimed at identifying possible mechanisms that connect the oxidative stress pathway to the apoptosis or cell death regulatory machinery in the budding yeast, S. cerevisiae. We have generated all the necessary yeast strains and gene expression systems, including a strain of yeast that expresses the mouse BCL-2 gene, an inhibitor of apoptosis. To increase the probability of isolating the appropriate mutants, the growth conditions for the genetic screen have been reworked over the past year to include an apoptosis inducer, hydrogen peroxide, in the growth medium. To date, all conditions for the screen have been established and tested. An exhaustive genetic screen will require
analyzing nearly 250,000 yeast colonies. We have begun screening for the appropriate mutant cells and the identification of these mutants will be presented.

**Greg Fischer (209)**  
Faculty Advisor/Collaborator: **Julie Anderson**  
*Heterologous Expression of MBT1 from *C. albicans* in *S. cerevisiae*

The yeast species *Candida albicans*, the most commonly-isolated yeast in human disease and systemic infections, have emerged as important causes of morbidity and mortality in immunocompromised patients. To infect host tissue, the usual unicellular yeast-like form of *C. albicans* switches into an invasive, multicellular filamentous form. This morphogenesis or conversion from the yeast state to the filamentous state has been shown to contribute significantly to the pathogenesis of *C. albicans*. Dan Herman in the UW-Eau Claire Biology Department has been investigating the role of the MBT1 gene in this process. The MBT1 homolog in the nonpathogenic budding yeast, *S. cerevisiae*, has been well-studied and is known to play a role in the regulation of the cell division. To further our understanding of MBT1 in *C. albicans*, we are expressing *C. albicans* MBT1 in the more genetically amenable yeast, *S. cerevisiae*. This involves constructing the MBT1 gene under control of a *S. cerevisiae*-specific promoter sequence, introducing this DNA construct into budding yeast and assessing the resulting phenotype. The results of these experiments will contribute to our understanding of the role of MBT1 in the pathogenesis of *C. albicans*.

**Traci Griffith (267)**  
Faculty Advisor/Collaborator: **Todd Wellnitz**  
*Identifying Quadrula metanevra from Similar Mussel Species in the St. Croix River Using Glochidia Morphometrics*

The freshwater mussel life cycle includes a parasitic larval stage called glochidia and the use of host fish. Little is known about some species and their specific hosts. Host fish can be identified by infesting fish with glochidia and keeping them in the lab to see if juveniles are produced; however, the best way to identify a host is to collect fish that have been naturally infested and to see if they produce juveniles. The aim of this study was to determine species-specific measurements of monkeyface (*Quadrula metanevra*) juveniles as a means of identifying host fish species. Glochidial shell length, height, and hinge length were measured from five different species found in the same reaches of river. I found that shell length/hinge length ratios were significantly different from *Q. metanevra* for higgins’ eye (*Lampsilis higginsii*) and fat mucket (*Lampsilis siliquoidia*). *Q. metanevra* was also significantly different from plain pocketbook (*Lampsilis cardium*), black sandshell (*Ligumia recta*), and *L. higginsii*. With these ratios, *Q. metanevra* glochidia and possibly juveniles can be distinguished from the other four similar species measured. This will aid in the proper identification of glochidia and juveniles collected from naturally infested fish.

**Kari Gullickson (233)**  
Faculty Advisor/Collaborator: **Wilson Taylor**  
*Ultrastructure of Spiny Megaspores from the Middle Devonian of New York State*

An assemblage of fossil plant spores from the Middle Devonian of New York state (approx. 375,000,000 years old) was extracted using standard palynological techniques, including a final sieving through a 100µm nylon mesh. Measurements of these spores uncovered a size range of 141-206µm. A previously reported spor size range from nearby deposits of 86-166µm was of spores putatively produced by the enigmatic plant *Calamophyton*. One variety of spores, probably not associated with *Calamophyton*, has long spines. Individual images of these spores were captured using the scanning electron microscope (SEM). The aim of this project is to use transmission electron microscopy (TEM) to: 1) examine the spiny specimens for variations in wall thickness, layering, staining, and overall substructure, 2) compare these spores with contemporaneous varieties putatively associated with *Calamophyton*, and 3) identify any ultrastructural characters that might be used to determine what plant might have produced these isolated spores. Little is known of the fine structure of spores of this geologic age since none have been
examined with the TEM. Any information gathered will ultimately contribute to the understanding of plant diversity in this time of active plant evolution.

Kaitlin Hartshorn (230)
Faculty Advisor/Collaborator: Daniel Janik
Effect of Nightlight on Circadian Clock Resetting in Mice

Mice, like all animals, have an “internal clock” that strongly affects their activity levels. They are nocturnal, demonstrating high levels of activity at night and sleeping during the day. Changing when the light goes on and off can reset their internal clock. Previous studies have demonstrated that maintaining a dim light (rather than no light) during the night changes how much the mouse’s internal clock is reset by a transition to complete darkness. We have varied the intensity of dim light at night to determine which level is the most effective at inducing large shifts in the internal clock when animals are subsequently transferred to complete darkness in the middle of their sleep phase. In addition, we analyzed the effect of dim light intensity on several other behavioral measures, including overall activity levels and the phase angle of entrainment (i.e., the onset of night time activity relative to lights off).

Corey Hilber and Sarah Peterson (182)
Faculty Advisor/Collaborator: Kristina Beuning
The UW-Eau Claire Carbon Inventory

In spring 2008, ten UW-Eau Claire (UWEC) students enrolled in IDIS 352 conducted an inventory of the current carbon dioxide emissions of the UWEC campus. The purpose of the UWEC carbon inventory project was to quantify the equivalent carbon emissions (eCO₂) that were generated over an academic year at the UWEC from electricity and cooling, heating, transportation, waste and chemicals. The combined total of these eCO₂ emission categories comprised the UWEC carbon footprint, which initially equaled 41,560 metric tons of eCO₂ per academic year but was reduced to 39,964 metric tons of eCO₂ after including the present university offsets of commuting ridership on the Eau Claire Public Transit System, the use of Veolia Environmental Services Waste-to-Energy program, and CO₂ sequestration by university and UWEC Foundation land ownership. The UWEC carbon inventory report also included several university-wide, non-quantifiable recommendations for reaching carbon neutrality. The carbon inventory research was done in response to requirements of the American College and University President's Climate Commitment (ACUPCC), which Chancellor Brian Levin-Stankevich signed in August 2007. In September 2008, the results of this work were released as a public document.

Jacob Janssen (207)
Faculty Advisor/Collaborator: Derek Gingerich
BTB Domains from the Physcomitrella patens Genome

BTB-CUL3 E3 Ub-ligase complexes direct the ubiquitination of proteins the cell no longer needs. This ubiquitination leads to degradation of the target protein. The BTB (Broad complex/Tramtrack/Bric-a-Brac) domain-containing proteins act as the target adapters for these E3 complexes, directly binding the proteins to be ubiquitinated. BTB domain-containing proteins are encoded by large, complex gene families in eukaryotes (including plants). In this study the genome of Physcomitrella patens, a nonvascular moss, was analyzed for genes which encode these proteins. We used known BTB domain sequences from a variety of eukaryotes in BLAST (Basic Local Alignment Search Tool) queries of the Physcomitrella genome to identify genes which encode proteins with the domain. An initial round of searches identified 66 putative functional BTB genes and 4 BTB pseudogenes. The annotations of all 70 genes were hand-checked and in numerous cases altered. BTB domains are found to be connected to a variety of other protein-protein interaction motifs in Physcomitrella, suggesting a wide range of proteins are targeted for ubiquitination by BTB-CUL3 E3s in this plant. Comparison of the Physcomitrella BTB family to the family in the plants Arabidopsis and rice will also be presented.
Alexandra Karosas (256)
Faculty Advisor/Collaborator: David Lonzarich and Susan Gresens (Towson University)

Effects of Silt Clay Sediment in a Phosphorus-Limited Algal-Grazer Food Chain

Silt clay sediment is a major pollutant of streams and rivers in the United States, causing problems that include turbidity, shading, and declines in water quality. Clay sediments have varying phosphorus (P) sorption properties, and as an often limiting nutrient in streams, P is a valuable nutrient for algal and grazer growth. We conducted a 6-week experiment to determine if silt clay sediments had a positive or negative effect on algal growth, and if an indirect effect on grazer growth occurred. Microcosms were used to imitate stream environments. Three sediment treatments and two grazer treatments (with and without grazers) were used. Algal growth was measured by chlorophyll a concentrations and phosphorus limitation was measured using an alkaline phosphatase activity (APA) assay. Grazer growth was measured using a length/ash-free dry mass regression. There was no significant difference in algal growth among sediment treatments but there was a significant decrease in algal biomass in grazer treatments. Treatments with grazers were also significantly more P-limited. The high P requirement for grazer growth likely did not leave sufficient P for algae to offset grazer consumption. Grazer growth also significantly decreased in treatments containing sediment, likely as a result of a decline in food quality.

Alexandra Karosas, Brian Hull, Brenna O’Gorman and Ernest Ruiz (257)
Faculty Advisor/Collaborator: Todd Wellnitz

Evaluating the Application of Island Biogeography Theory and the Effects of Insularity in the Boundary Waters Canoe Area Wilderness

Two theories of island biogeography attempt to explain the factors affecting species richness of natural communities: the Habitat Diversity Theory (HDT) and the Equilibrium Theory of Island Biogeography. In September 2008, we tested which theory best describes the richness of woody plants among the islands in the lakes of the Boundary Waters Canoe Area Wilderness (BWCAW). We examined the woody plants on 11 islands of various sizes and distances from the lakeshore. Species richness was estimated using a belt transect which bisected each island. Habitat types were defined qualitatively in the field, and quantified using soil samples, slope data, and canopy cover. Island size had a direct, positive effect on both species richness (r=0.44), and number of habitats (r=0.81). The number of habitats also had a direct, positive effect on species richness (r=0.53). Distance from shore had no effect. We conclude that HDT best describes the richness of woody plants among the islands of the BWCAW. For woody plant species, the islands don’t appear to be real “islands” with regards to insularity. Possible future studies may compare other organisms on the islands of the BWCAW to determine how insularity and island biogeography theory apply to those species.

Cassondra Kowalski (235)
Faculty Advisor/Collaborator: Daniel Janik

Characterization of Nonphotic Resetting of the Mouse Circadian Clock

We have constructed a phase response curve (PRC), for light-to-dark transitions in male mice showing that phase shifts are specific to the phase of the daily cycle at which they are administered. As is true for nonphotic PRCs in other species, the mouse PRC shows large advance shifts when animals are stimulated during the normal rest phase and little or no shifting when animals are stimulated during the activity phase. We also asked whether circadian clock resetting was the same in female mice as in males. In general, females showed robust resetting, but it was more variable than in males.

Chris Langel, Jordan Junion, Tricia Hernick and Jason Longmeir (258)
Faculty Advisor/Collaborator: Todd Wellnitz

Impacts on Portages in the Boundary Water Canoe Area Wilderness

Human impact on the environment occurs wherever we go, even when we try to minimize our presence. The portages that link the lakes of the Boundary Waters Canoe Area Wilderness provide a case in point. The plant communities through which these portages traverse are affected by human traffic. To test the
impact humans have on the plant communities bordering these wilderness trails, we compared plant abundance, size, and specific leaf area (SLA) across this disturbance gradient. We recorded soil density, counted understory plant species, and collected the youngest leaf of several common species to determine SLA. We found that higher soil compaction was negatively correlated with diversity and SLA. However, while human trampling kills and damages plants on the trail, the trail also allows more light to penetrate the forest canopy, resulting in higher diversity and increased plant SLA near the trail. The higher SLA may indicate that plants near the trail are less stressed because they need not repair damage caused by trampling, and thus, can shift more resources to photosynthesis and leaf growth. Human disturbance of natural communities is common; however, such disturbances may affect resident species positively as well as negatively.

Timothy Lauer (210)
Faculty Advisor/Collaborator: Derek Gingerich  
Suppressor Screen of LRB (Light Response BTB) 1/ LRB2 Mutants in Arabidopsis thaliana

The ability to sense and respond to changing light conditions is fundamental to plant growth and development. One way that plants respond to light is via the perception of red (~660 nm) and far-red (~730 nm) wavelengths. The signaling pathways in the cell that are involved in this response are not well understood. Derek Gingerich has identified two redundant genes which act in the red light response pathway in the model plant Arabidopsis thaliana: LRB (Light Response BTB) 1 and LRB2. Disruption of both of these genes results in a plant which is hypersensitive to red light. In order to better understand the roles of LRB1/2 in red light signaling we conducted a genetic suppressor screen to identify other components of the LRB-modulated red light pathway. We generated a population of LRB1/2 double mutants with additional mutations in the genome and screened this group for individuals that lack the red light hypersensitive phenotype. We identified more than 30 putative suppressor mutants and are currently confirming/quantifying the phenotypes in the offspring of these individuals. Identification of the genes disrupted in these suppressor mutants should clarify the role of LRB1/2 in red light signaling and reveal previously unknown components of these pathways.

Courtney Lynne, Jason Ryba and James Taylor (232)
Faculty Advisor/Collaborator: Wilson Taylor  
Determining Evolutionary Relationship among Lycopsids Using Spore Wall Ultrastructure

Lycopsids are recognized as ancient seedless vascular plants that arose during the Early Devonian Period. Lycopsids demonstrate a variety of growth types, existing as both free-sporing herbs and 40 meter high trees that dominated many swamp forest landscapes. Fossil remains of these 300 million year old arborescent (tree-sized) lycopsids exhibit more diversity and ecological and economic significance than the living lycopsids of today (impressively, these lycopsid fossils account for a substantial portion of the Pennsylvanian coals of Euramerica). Uncertainty remains with respect to evolutionary relationships among early lycopsids. One unusual feature of their spore walls is a multilamellated area that is present in the modern lycopsids Isoetes and Selaginella, as well as basal lycopsid fossils as old as 400,000,000 years. Identifying this feature in other fossil lycopsids provides one means of deciphering evolutionary relationships. One major group in which this structure has yet to be identified is the Lepidodendrales. The purpose of this study was to find this structure in isolated microspores of the genus Lycospora, using electron microscopy.

Angela Manlick, Jennifer Ritchie and Nathan Tisdell (184)
Faculty Advisor/Collaborator: Sasha Showsh  
Bacteriocin Gene Isolation and Physical Characterization in Enterococcus faecalis

Enterococcus faecalis is an opportunistic bacterium that has become one of the most troublesome hospital pathogens. It has intrinsic resistance to many antibiotics and a remarkable capacity for developing resistance to others. As an opportunistic pathogen enterococci can cause nosocomial infections such as urinary tract infections, bacteremia, and infective endocarditis. The strain used in this project is a vancomycin - resistant Enterococcus clinical isolate which contains a plasmid that encodes
production of a bacteriocin. Bacteriocins are toxic proteins produced by bacteria to inhibit the growth of similar or closely related bacterial strains. As the food industry and medical institutions face a growing problem of resistant strains of pathogenic bacteria—ones against which antibiotics have become less or even completely ineffective-bacteriocins provide a promising alternative to controlling microbial growth. Some have already found use in the food industry as preservatives, and this project aims to provide support for their future use in society. In this project we are using recombinant DNA techniques to isolate the bacteriocin gene from plasmid pAM369 in *E. faecalis* as well as physically characterize the bacteriocin protein.

**Mathew Mergenthaler (231)**  
Faculty Advisor/Collaborator: Danel Janik  
*Effects of Dim Phase Light Intensity Modulation on Circadian Rhythms in Syrian Hamsters*

Nonphotic stimulation induces arousal in animals and resets circadian clocks. It is known that maximal phase advances in circadian locomotor activity rhythms of Syrian hamsters (*Mesocricetus auratus*) are produced by stimuli at zeitgeber time (ZT) 4.5. Previous tests have shown that bright-dim (BD) photic cycle entrainment produces a larger response than light-dark (LD) photic cycle entrainment when introduced to constant dark at ZT 4.5. However, no studies have been conducted to determine the intensity of the dim phase that results in the greatest circadian advance. In the current experiment, we are examining phase shifting in male Syrian hamsters via dark pulse after 14 day entrainment in four different dim phase light intensities. We will also determine the effect of the different intensities on overall locomotor activity and on circadian entrainment.

**Christopher Naus and Matthew Jacobson (257)**  
Faculty Advisor/Collaborator: David Lonzarich  
*Exploring Temporal Dynamics and Regulatory Behaviors of Foraging Groups of Juvenile Coho Salmon*

Juvenile coho salmon (JCS) choose to enter foraging groups because of the benefits of group membership, which should vary as a peaked function of group size. Individual benefits are highest at the optimal group size, and decrease with the addition of new members until an equilibrium size is reached (i.e., when the addition of new members decreases fitness below that of foraging alone). Theory predicts that foraging groups will grow to an equilibrium group size. However, previous research on JCS has shown that fish maintain group sizes near an optimal size, suggesting active control over membership. In this study, we observed 126 foraging groups of JCS to gain insights into the dynamics of group structure and why individuals choose to enter or leave groups. From data generated via underwater observations and video, we documented individual behaviors concerning foraging and aggression in relation to group size and fish residency patterns. Our chief findings to date are that foraging success is positively correlated with group stability, and that transient fish feed no differently, but are two times more likely to be attacked than residents. Our tentative conclusion is that group membership is regulated through aggression rather than variability in foraging success.

**Stephen Nikolai (259)**  
Faculty Advisor/Collaborator: Todd Wellnitz  
*Fire Effects on Lake Ecosystems: Water Chemistry and Zooplankton Community Structure*

To determine the effects of fire on lake zooplankton communities in the Boundary Waters Canoe Area Wilderness, we sampled a burned and unburned lake one year before and two years after the Ham Lake Fire of 2007. A Detrended Correspondence Analysis of zooplankton and environmental data showed that the burned lake’s zooplankton community composition was associated with the sample year, suggesting that the forest fire caused a shift in species composition. By contrast, the non-burned lake’s zooplankton community was more closely associated with the sample month, suggesting that zooplankton were undergoing normal yearly cycles of relative abundance. Total Organic Carbon (TOC) was significantly elevated in both burned (p=0.02) and unburned (p=0.004) lakes immediately after the 2007 fire. Increased TOC levels were also correlated to increases in total phosphorus, primary production, total Kjeldahl nitrogen, and total suspended solids. The observed shift in zooplankton composition and
increased TOC concentrations following forest fires has not been previously documented. This research may offer new insights on how forest fires directly and indirectly affect freshwater ecosystems.

Elizabeth Raupach (161)
Faculty Advisor/Collaborator: Lloyd Turtinen
Optimization of an Apoptosis Detection Assay in Human Kidney (HK-2) Cells

Identification of apoptosis and quantification of cell death can be done with a combination of morphological criteria and analysis of DNA. A newer method utilizes an in situ approach to identify cells with damaged DNA due to apoptosis. We established conditions to grow monolayers of HK-2 cells in 8-well chambered slides and established criteria for efficient labeling using different permeability agents and fixation procedures. We are currently investigating whether various fungal antibiotics induce apoptosis in these cells.

Amanda Smith and John Gamble (183)
Faculty Advisor/Collaborator: Winnifred Bryant
Environmental Estrogens Regulate Transcriptional Activity of the Prolactin Promoter

Environmental estrogens (xenoestrogens and phytoestrogens) are ubiquitous compounds that mimic the effects of endogenous (ovarian) estrogen in various targets including brain and pituitary, breast and uterus. This study examined the effects of environmental estrogens on the transcriptional activity of the prolactin promoter, an estrogen regulated gene. Our results indicate that environmental estrogens differentially regulate the prolactin promoter and that these effects are moderately enhanced by Pit-1, a pituitary-specific transcription factor. These results are significant because they demonstrate that physiologically complex promoters can indeed be regulated by environmental estrogens. Thus, exposure to environmental estrogens could have significant effects on reproductive neuroendocrine events.

Matthew Smrz (234)
Faculty Advisor/Collaborator: Daniel Janik
Methamphetamine Induces Nonphotic Resetting of Circadian Clock in the Male Syrian Hamster

Resetting of circadian clocks in male Syrian Hamsters can be manipulated photically and nonphotically. Previous work has suggested that Propranolol, a known beta-adrenergic antagonist, may block nonphotic clock resetting in male Syrian Hamsters. To test this hypothesis, we administered adrenergic agonists that may induce resetting of the circadian clock without the need for behavioral stimulation. It was found that methamphetamine, a catecholylminergic agonist, did in fact cause dose-specific clock resetting of approximately 1.5-3 hours at a dose of 40 mg/kg in male Syrian Hamsters. Previous research has shown that methamphetamine is a strong releaser of both dopamine and noradrenalin in the hamster brain. In an effort to determine the mode of action of methamphetamine in nonphotic clock resetting the nonspecific dopaminergic antagonist clozapine and the beta adrenergic antagonist propranolol were administered in conjunction with methamphetamine. Both antagonists were found to significantly reduce clock resetting that would have otherwise been induced by methamphetamine alone. However, administration of methamphetamine and saline at Zeitgeber (ZT) 12 did not induce circadian clock resetting. These data suggest that stimulation of adrenergic receptors may be necessary for nonphotic circadian clock resetting, and that stimulation at normal waking time (ZT 12) does not induce a phase shift.

Staci Solin, Hannah Humbach and Jenna Karras (186)
Faculty Advisor/Collaborator: Daniel Herman
Defective Morphogenesis in MBP1 Null Mutant Strains of Candida albicans is Specific to Solid Media

Candida albicans is a pathogenic yeast capable of undergoing morphogenesis, which is the transition from yeast to hyphal morphologies. Morphogenesis is induced under a variety of environmental conditions such as limiting amounts of nitrogen, lack of a fermentable carbon source, neutral pH, and
serum. These environmental stimuli are transmitted to the nucleus via several different signal transduction pathways resulting in the differential gene expression required for morphogenesis. We have previously cloned and partially characterized the MBP1 gene of *C. albicans* and shown that null mutant strains that cannot synthesize the Mbp1 protein are defective in morphogenesis under nitrogen limiting conditions on solid media. To further characterize the function of the Mbp1 gene, the ability of wild-type and MBP1 null mutant strains to undergo morphogenesis was assessed when grown in liquid media under conditions that should stimulate morphogenesis. No difference in germ tube formation was evident between wild-type and MBP1 null mutant strains in all media tested, including nitrogen limiting media. We conclude that the Mbp1 protein is required for morphogenesis under nitrogen limiting conditions when grown on solid media, but the Mbp1 protein is not required for morphogenesis when *C. albicans* is grown in liquid media.

**Leah Ullom** and **Matthew Faust** (185)
Faculty Advisor/Collaborator: **Chris Floyd**

*Ecological Determinants of Nest-Site Selection by a Keystone Species: the Red-naped Sapsucker*

Woodpeckers are considered keystone species because they excavate nest cavities that eventually provide shelter for other species. In aspen woodlands of the southern Rocky Mountains, red-naped sapsuckers are the predominant woodpecker, providing nest cavities for several bird species. Sapsuckers also create sap wells in willows, supplying nutrition for many birds, mammals, and invertebrates. Previous work in the upper East River Valley (ERV), near Gothic, Colorado, indicated that sapsuckers avoid nesting far (> 300 m) from willows. However, this work did not measure potentially confounding variables, such as prevalence of the heart-rot fungus, *Phellinus tremulae*. The sapsuckers nest almost exclusively in aspens infected with this fungus, which softens the heartwood, making it easier for the sapsuckers to excavate their nests. In summer 2007 we studied the relationship between willow proximity, *Phellinus* prevalence, and other variables in the ERV. Our results suggested that sapsuckers chose nest sites primarily on the basis of *Phellinus* prevalence, not willow proximity. To test the robustness of these results we expanded our study area to sites outside the ERV during summer 2008. Our results from 2008 were similar to those from 2007, except that the relationship between nest site choice and *Phellinus* prevalence was weaker.

**Jasmine Wiley, Christopher Naus, Matt Sisco** and **Jamie Dins** (254)
Faculty Advisor/Collaborator: **Todd Wellnitz**

*How Shore Orientation and Substrate Type Structure Lichen Communities in the Boundary Waters Canoe Area Wilderness*

Rock inhabiting lichens are important pioneer species in the aquatic-terrestrial transition zone of lakeshore habitats in the Boundary Waters Canoe Area Wilderness (BWCAW) of northern Minnesota. We quantified lichen distribution and abundance from sixteen sites on six lakes, identified substrate type, and measured shoreline aspect, slope, distance to vegetation and tree-line, and height of high-water mark (HWM). The effects of these factors on lichen species richness and percent cover were examined using backward selection linear models. Our data showed that height of the HWM, slope, distance to tree-line, and northern aspect were positively correlated with lichen richness (p< 0.001). These factors also influenced lichen percent cover, as did distance to vegetation and eastern aspect. North-facing and east-facing shores averaged two species more than did other shoreline orientations, which may have been due to damaging light intensities restricting lichen growth on south-facing shores. West-facing shores had the lowest richness, which may have been a consequence of greater wave disturbance from prevailing westerly winds. Four substrate types (schist, sandstone, slate, and granite) were negatively correlated to lichen richness (p<0.001; R2=0.58). Our study shows how lichen communities are shaped by multiple environmental factors and suggests the processes that underlie observed community patterns.
Cryptosporidium are parasitic protozoa that infect a wide range of vertebrate hosts. Cryptosporidiosis causes gastrointestinal illness, dehydration, and occasionally death, especially in young animals. While livestock are commonly studied hosts of Cryptosporidium, few reports document the existence of the parasite in wildlife or exotic species. To test for the presence of Cryptosporidium, fecal samples were obtained from 12 mammals housed at Irvine Park Zoo, including Coatimundi, ring-tailed lemurs, American porcupines, American Elk, Whitetail deer, White fallow deer, Bison, Potbelly Pigs, Black capped capuchins, Bobcats, Cougars, and Black Bears. The fecal specimens were smeared onto microscope slides, then stained using a carbol fuchsin and malachite green stain and viewed using microscopy. Of the 12 mammals all fecal samples were negative for Cryptosporidium. This could be due in large part to the cleanliness and the adequate separation of each species. Further studies of these certain species in different environments may yield different results.

**Chemistry**

**Lindsey Arnold (112)**
Faculty Advisor/Collaborator: Thao Yang
**Synthesis of Cyclic Mucin Peptide Derived from the Tandem Repeat Domain of MUC-1 Mucin**

Mucin proteins are membrane-associated glycosylated proteins expressed by normal vertebrate epithelial cells. Specifically, the MUC-1 members serve to lubricate the epithelial surfaces, protect them from dehydration, and serve as a barrier to infection in ovarian, airway, gastrointestinal tract, and pancreatic cells lining the ducts. Overexpression and abnormal glycosylation of MUC-1 proteins is found in carcinoma cells and allows for specific adhesive capabilities. The Solid-Phase Peptide Synthesis method was used to synthesize the cyclic mucin peptide TSAPDTRPAP, a portion of the Variable Number Tandem Repeat domain (VNTR) of the MUC-1 protein. In this poster, the reaction mechanisms of peptide synthesis using Fmoc-amino acids and coupling reagents (HBTu and HOBt) will be described. Preliminary characterization of the peptide by one-dimensional Nuclear Magnetic Resonance Spectroscopy (1D-NMR) and Liquid Chromatography-Mass Spectrometry (LC-MS) will be presented.

**Skye Doering and Kirsten Strobush (91)**
Faculty Advisor/Collaborator: James Boulter
**Effect of Dissociated Oxygen on the Infrared Spectra of Low-Temperature Water Ice Films**

We present results from high-vacuum experiments of heterogeneous interactions between water ice films and partially dissociated oxygen. This work investigates interactions between polar mesospheric cloud (PMC) particles and atomic oxygen, the primary reactive species at this altitude. Water ice films are deposited onto a gold mirror maintained at temperatures below 100K in the presence of microwave discharge-dissociated oxygen. Incompletely coordinated (or “dangling”) OH bonds, indicating the degree of disorder in water ice, are measured with grazing-angle Fourier-transform infrared reflection-absorption spectroscopy (FT-IRRAS). Any changes in the water ice films, structural or otherwise, that may be induced by dissociated oxygen are further characterized by temperature-programmed desorption mass spectrometry (TPD-MS). The strength of interactions between ice and simple organic probe molecules, determined by TPD-MS, characterizes the microstructure of the ice films.

**Alexander Greene and James Rauschnot (111)**
Faculty Advisor/Collaborator: Sanchita Hati and Sudeep Bhattacharyay
**A Fast Method to Identify Network of Communication in Aminoacyl-tRNA Synthetases**

Domain-domain communications play an important role in the function of aminoacyl-tRNA synthetases. However, the way enzymes communicate between domains has remained poorly understood despite
several biochemical studies. One key difficulty in understanding this process lies in the unavailability of a reliable means to identify key residues involved in these long-range communications. We are developing a fast method, combining bioinformatics and coarse-grain modeling tools, to identify residue networks that strongly influence domain-domain communications. In this method, we are studying very slow protein motions that encompass large domains while analyzing the correlated and anti-correlated pattern of residue motions that are located at domain interfaces. A separate bioinformatics-based study is then conducted where a statistical tool is used to extract coevolved residues at the same interface region. Results of these two studies are combined to obtain the residue network. Initial use of this method on leucyl-tRNA synthetase has shown great promise in identifying key residues influencing long-range communications. Herein, we will report some preliminary results of the extension of the study on isoleucyl-tRNA synthetase.

Jason Greuel (136)
Faculty Advisor/Collaborator: Kurt Wiegel

Premature Crystallization of Hydrogen-Bonded Liquid Crystalline Networks in the Mesophase

A series of liquid crystalline networks has been assembled from well-studied materials. These networks consist of a bis-benzoic acid species (4EO BBA), a rigid bis-pyridyl species (2RP) and a non-rigid tetrapyrrol competitive bond acceptor (network-forming agent, p-TPPE). These systems display liquid crystalline properties at up to 25% inclusion of P-TPPE. The networks were subjected to an isotherm study where the complexes were annealed in the mesophase. This caused a premature recrystalization during the last liquid crystalline phase observed in the cooling cycle. This recrystalization was observed using a differential scanning calorimeter (Mettler Toledo DSC823) and a polarized light microscope. Correlations will be drawn between the extent of crystallization and time spent in the isotherm, as well as network concentration.

Michael McAnally (113)
Faculty Advisor/Collaborator: Thao Yang

Synthesis and Characterization of an Eleven-Residue MUC1 Peptide Structure in Solution by 2D NMR Spectroscopy

MUC1 peptides are based on the sequence of the tandem repeat domain of mucin expressed by cancerous cells in which immunity against a host could be induced. MUC1 peptides have been used as antigenic agents in the development of cancer vaccines. The purpose of this research is to better understand the structure and conformation of the MUC1 peptide so that in the future different peptides that would be more effective as antigenic agents can be synthesized. To analyze the structure and conformation, an 11-mer peptide with the sequence GVTSAPDTRPA was synthesized. 2D NMR data for complete proton assignments have been obtained in aqueous solution and DMSO. For free peptide at the NH-NH region of the NMR data in DMSO, we detected five NOEs between Val2-Thr3, Thr3-Ser4, Ser4-Ala5, Asp7-Thr8, and Thr8-Arg9, whereas in aqueous solution only two NOEs were detected between Asp7-Thr8, and Thr8-Arg9. These results may indicate that structural elements exist for the peptide in a less polar environment. This poster will present peptide synthesis by Solid-Phase-Peptide-Synthesis, data on the characterization of the MUC1 peptide by preparative HPLC and LC-MS, and 2D NMR data, which was used for evaluating the peptide conformation in solution.

James Rauschnot (110)
Faculty Advisor/Collaborator: Sudeep Bhattacharyay

Reduction Potential and Stabilization of Flavin Anionic Hydroquinone in Active Site of Quinone Reductase 2

Flavoenzymes utilize the cofactor flavin adenine dinucleotide (FAD) to catalyze a number of reactions including oxidations, dehydrogenations, hydroxylations, and electron transfers. Quinone reductase 2 (QR2) is one such flavoenzyme involved in catalytic reduction of quinones. QR2’s substrates exhibit strong recognitions for the redox states of the flavin 7,8-dimethylisoallozazine. Binding/release of the substrate is synchronized with redox changes of the flavin ring which oscillates through a classic ‘ping-pong’ mechanism. The reduction of flavin involves additions of one or two electrons/protons to form
radical semiquinone and stable hydroquinone, respectively. Various redox changes of the enzyme, however, lead to unequal charge separation between the flavin ring and active site. Consequently, the protein-environment must induce major reorganization of the active site to stabilize the electronically different flavin ring. In this study, a combined quantum mechanical/molecular mechanical method was employed to simulate redox changes of flavin-bound QR2 for one and two electron/proton additions. From this simulation, we have been able to compute the redox potentials for these processes. We have found that the QR2 active site is capable of stabilizing the flavin anionic hydroquinone. Simulation data has also allowed computation of the “reorganization energy” as the flavin enzyme oscillates between the two redox states.

Miranda Riemer (134)
Faculty Advisor/Collaborator: Jason Halfen and Jim Phillips
Mechanism of the Iron-Mediated Alkene Aziridination Reaction: Experimental and Computational Investigations

Combined experimental and computational studies suggest that the iron-mediated aziridination of cis-1-phenylpropene proceeds along two mechanistic pathways that share a common imidoiron(IV) intermediate. One pathway involves a second species, proposed to be an azametallacyclobutane intermediate, which collapses to provide the syn-aziridine product. A second, parallel pathway is responsible for the formation of an anti-aziridine.

Phillip Schieffer and Timothy Andrews (137)
Faculty Advisor/Collaborator: Kurt Wiegel
Electronic and Structural Substituent Effects on Supramolecular Mesophase Structure and Stability

Given that the strength of the hydrogen bond of an assembly helps to determine the liquid crystallinity of a supramolecular system, consideration is given to the electron density around the hydrogen bond acceptor. This density is varied using different substituent groups attached to the para position of a stilbazole, including N(CH3)2, OCH3, CH3, H, Br, Cl, F, CF3, and NO2. These will then be coupled with a hydrogen bond donor (4-octyloxy benzoic acid). A given electron density around the pyridyl group is expected based on the substituent's electron withdrawing or donating character based on Hammet values. This density is thought to influence liquid crystalline characteristics, mainly clearing and mesophase nucleation temperatures. Consideration is also given to the dipole of the stilbazole as well as the hydrogen bonded system. Models are created to determine these dipole moments using Spartan calculations. Thermal data was collected and analyzed using differential scanning calorimetry. Results indicate the electron densities derived from Hammet's Equation may be significant, but may be outweighed by other factors associated with the substituent.

Teresa Swanson (135)
Faculty Advisor/Collaborator: Scott Hartsel
Without a Trace - The Mystery of the Missing Electron

Methanobactin is a small peptide secreted from menthanotrophs which scavenges copper ions from its environment for use in the methanotrophic metabolism. Methanobactin has a very strong affinity for copper ions and reduces many metal ions which include copper, silver, gold and possibly mercury. We are studying the mechanism by which Cu(II) is reduced to Cu(I) by methanobactin and where the electron(s) involved come from. Examining the structure of methanobactin and the identity of its functional groups reveals possible origins of the mysterious electron in the four sulfur atoms. Reaction of methanobactin with N-ethylmaleimide, a substance that reacts with free sulfhydryl groups, suggest that the cysteine residues in methanobactin are already oxidized and inaccessible for electron donation to metals. Microtitration methods have been used to compare the spectrophotometric differences in Cu(I) and Cu(II) bound to methanobactin. Other than the slight difference in ratios of copper saturation, there is little difference seen in the spectra of Cu(I) and Cu(II) with methanobactin. The only obvious change is
the increase in light scattering in Cu(II) vs. Cu(I) samples. This suggests greater aggregation of the Cu(II) form which could relate to the missing electron and possible free radical reactions leading to aggregation.

John Wrass (138)
Faculty Advisor/Collaborator: Jim Phillips

Computational Study of the Lewis Acid-base Complex: CH₃CN-BCl₃

A computational study was performed on the Lewis acid-base complex acetonitrile-boron trichloride (CH₃CN-BCl₃). The equilibrium geometry was calculated using several methods and basis sets, and two distinct equilibrium structures were located (at 1.6 and 2.3 Angstroms). Calculated B-N potential curves demonstrate two distinct minima corresponding to these equilibrium structures. The experimental crystal structure has a B-N distance of 1.65 Angstroms, which corresponds to the primary minimum in the potential. The effects of polar media on the Boron-Nitrogen potential, as well as comparisons of calculated gas-phase and measured solid-state frequencies will be interpreted in terms of solvation effects on the structure of this complex.

Chee Yang, Alexander Greene and James Rauschnot (115)
Faculty Advisor/Collaborator: Sudeep Bhattacharyay and Sanchita Hati

Exploring Electron-Transfer-Induced Conformational Changes in NRH:quinone Oxidoreductase

NRH:quinone oxidoreductase is a flavoenzyme that catalyzes the one-step reduction of quinones to hydroquinones using its cofactor, FAD. The enzyme kinetics goes through a ‘ping-pong’ mechanism in which changes in the flavin redox state control substrate binding and release. In the reductive half-cycle, the first substrate binds and transfers electrons to the flavin, inducing a conformational change of the active site that favors release of the substitute. Subsequently, the second substrate binds the same site and accepts electrons from the flavin, thus completing the redox cycle. The redistribution of charges at the active site causes a reversion back to the initial conformation, and thus, the cycle repeats. In a previous molecular dynamics simulation study the observed changes (near the flavin) were in the pico – nanosecond time-scale and cannot account for the oscillatory movements that the active site would need to process the binding and release of the alternate substrates. In this study, we are investigating the slower dynamics of the subunit interface (surrounding the active site) using Normal Mode Analysis and exploring its relationship with the faster local motions. The role of coevolving residues on the dynamics is also being examined using Statistical Coevolution Analysis.

Kurt Zimmerman, Alexander Greene and Bach Cao (114)
Faculty Advisor/Collaborator: Sanchita Hati

Role of Coupled Domain Motions on the Catalytic Activity of Escherichia coli Prolyl-tRNA Synthetase

Prolyl-tRNA synthetases (ProRSs) catalyze the covalent attachment of proline to the 3’-end of the tRNAPro. Escherichia coli (Ec) ProRS possesses an editing domain that hydrolyzes specifically alanyl-tRNAPro. Earlier studies demonstrated that deletion of this editing domain has profound impact on the amino acid activation efficiency of Ec ProRS. Our present study on the normal mode analysis of ProRS demonstrated that the editing domain is involved in anticorrelated motion with a catalytically important loop - the proline-binding loop. Herein, we report the effect of global domain motion on the faster motion of the proline-binding loop of Ec ProRS. We present the results of normal mode calculations and mutational studies. The combined NMA and mutational studies suggest that coupled domain motions are critical for the enzyme function.
Chemistry and Biology

Jacob Schafer, Michael Servi, Jay Nielsen, Matthew Haak, Matthew James

Faculty Advisor/Collaborator: Crispin Pierce and Sasha Showsh

Antibiotic Resistance in Commercial Septic Discharge

Bacterial antibiotic resistance generated from a large retail store and a small chain restaurant was measured. Several samples of effluent from the respective septic systems were analyzed for bacterial resistance to ampicillin, kanamycin, tetracycline, and erythromycin. It was found that the restaurant contained higher levels of resistance to ampicillin, kanamycin, and tetracycline, with an average of 51.79%, 27.54%, and 30.78% of microbial growth resistant to the respective antibiotics. The store generated an average of 17.50%, 17.87%, and 5.97% resistance to ampicillin, kanamycin, and tetracycline. Erythromycin resistance was greater in effluent discharged from the store at 7.00% than it was in the restaurant at 2.87%. These finding are significant because they create a baseline percentage of normal or expected antibiotic resistance discharged from commercial sites. Further sampling of health clinics and wastewater treatment plants will allow us to compare levels of resistance.

Computer Science

Alexander Cobian (88)
Faculty Advisor/Collaborator: Dan Stevenson

Designing a Horizontal Image Translation Algorithm for Use with Dynamic Stereographical Virtual Worlds

In any small-scale application of stereographical viewing technology, a significant challenge is faced: the greater the parallax between corresponding points on the images created by the right and left camera, the greater the depth effect. Simultaneously, the greater the chance that crosstalk and extreme ocular convergence angles will prevent the viewer from comfortably interpreting the pair of stereo images as a single, three-dimensional image. The parallax at the viewer’s point of focus must therefore constantly be kept within a certain acceptable range. The most effective and unrestrictive way of altering parallax is horizontal image translation (HIT), the process of simply sliding the stereo pair towards or away from each other until the parallax is at the desired value. While this process is trivial for static images, it is highly complex in the case of a constantly-moving camera in a dynamic 3D virtual world. We have gathered data on optimal HIT settings and error tolerances for various virtual depths and have used this data to develop an algorithm that optimally shifts the stereo images based on the depth of the virtual subject.

Carl Hoover and Heather Sommer (87)
Faculty Advisor/Collaborator: Michael Wick

The Chinese-to-English Translation of Creative Writings

Preliminary research reveals that current work in the machine translation of Chinese to English focuses entirely on a statistical approach. This approach measures the probability of a word appearing next to the previously translated word based on studies of corpora (collections of texts) on the same subject matter stored in databases. This approach does not allow for a culturally-sensitive translation with regards to the source language, as meaning is often lost through metaphor or folk-lore references. Translation is a difficult process and one which is often shied away from in favor of studying language in spoken or theoretical applications. By compiling a database to allow for the corpora analysis of creative works previously translated and employing an example-based approach to translation (in addition to the currently popular statistical approach), this daunting task can be made significantly easier. Various dialects and disparaging sociolinguistic statistics have been observed. Many prescriptive rules for the translation of Chinese to English have been compiled and discrepancies between textbook corpora and
contemporary spoken Chinese have been examined. Work is still in progress and these efforts are showing promise with the examination and development of corpora.

**Tanya Smeltzer (89)**
Faculty Advisor/Collaborator: Jack Tan

*Error Control in Dialog Systems*

In this interdisciplinary project, we examine the role of error detection, avoidance, and correction in spoken dialog systems. Currently used error control methods often assume that a user will provide all necessary information during a dialog exchange, only one user will be speaking at a time, and the user(s) will have access to a keypad should they need to spell a word after a misunderstanding in speech recognition. These are risky assumptions, as users are often accustomed to saying only what they feel is necessary, do not always have their hands free for typing, and may be taking part in a group event where multiple users are speaking at once. We are developing an improved suite of algorithms that addresses the problems with these common assumptions, while minimizing errors and improving the performance of these systems. It is crucial that error handling be as complete as possible to make systems accessible and, in some cases, avoid loss of life.

**Hou Xiong (90)**
Faculty Advisor/Collaborator: Paul Wagner

*Extending a Query Visualization System to Support Multiple Database Management Systems*

This research is focused on extending a previously developed database management system (DBMS) simulator, which visualizes the process of a query on an Oracle DBMS. The extension is to add support for the MySQL DBMS, an alternative, free, open source, and popular system. Throughout the research, differences and similarities between the two systems have been found and utilized to allow a single framework to simulate the two systems. This makes it easier to compare the different approaches of the two DBMSs, thus possibly expanding our knowledge in the process of writing more efficient queries. For example, they each handle temporary memory (cache) slightly differently, and status variables are shown throughout the simulation to support this. This research also shows that it is possible to extend the framework to support other DBMSs. As more DBMSs are added to the simulator, the more valuable of a tool it becomes. The improved query visualization system will help both DBMS course instructors and students better visualize the details of database system query execution.

**Computer Science, Geography and Anthropology, and Mathematics**

**Brian Troy and Mitch Phillipson (273)**
Faculty Advisor/Collaborator: Dan Ernst, Christina Hupy and Simei Tong

*An Automated Visual Evacuation Planning Application*

We present a user-friendly tool that will provide emergency management coordinators a means to quickly and accurately generate evacuation plans for cities or other municipalities. The application has been built as a plug-in for ArcGIS, a full-featured geographic information system. Besides being a powerful program, ArcGIS is in widespread use among the target community of emergency management planners. The interactive tool allows managers to easily designate the locations of shelter facilities and pick-up zones. Given these locations, the application will calculate driving times between all points using roadway network analysis. Finally, the information from this analysis will be processed by a simplex-based algorithm to determine optimal allocation of transportation resources and routes.
Geography and Anthropology

Justin Berg (162)
Faculty Advisor/Collaborator: Joseph Hupy
*Linking Anthropogenic Influence to Landscape Disturbance Patterns*

Landscape disturbance, ranging from forest fires to landslides, is a topic that receives a considerable amount of attention within the scientific community. However, humans often ignore, or fail to recognize, one of the largest contributing factors in landscape disturbance, ourselves. While considerable progress has been made in linking anthropogenic influences to landscape disturbance in some realms, such as with slope failure related to deforestation practices, many previously unlinked phenomena still require a considerable amount of research attention. This work concentrates on anthropogenic landscape disturbance by investigating the relationship between a small logging trail easement established in 1986 and a subsequent concentrated area of frequent tree fall occurrences thereafter; this area is now referred to by the landowners as the ‘dead zone’. Results from this study permitted the identification of tree felling as a result of two factors: wind and soil. The techniques employed in the quantitative modeling provide a better understanding of significant geological/geographical features from a physical and anthropogenic perspective. Of equal importance, the results from this study established a systematic and quantitative tool kit to identify tree fell behavior that can be used in a wide variety of other important terrestrial environments.

Eric Craft (164)
Faculty Advisor/Collaborator: Harry Jol
*Ground Penetrating Radar Imaging of a Cuspate Foreland, Sand Point, Michigan*

The park headquarters of Pictured Rocks National Lakeshore (Munising, Michigan) is located near the tip of Sand Point and is designated as a National Historical site. During high water levels of Lake Superior, flooding and erosion have threatened the headquarters. Since little is known about the internal sedimentary structure of the cuspate foreland (Sand Point), the purpose of this project is to determine if ground penetrating radar (GPR) surveys can a) image subsurface stratigraphy and b) aid in better understanding the coastal geomorphic processes that have formed Sand Point. Low frequency (50 MHz) GPR successfully imaged the internal structure of the cuspate foreland to depths of greater than 25 m. Two major radar facies truncated by an erosional surface are observed on the profiles. The upper facies (~0-7 m, thickens lakeward), composed of horizontal to sub-horizontal reflections, is interpreted as horizontally bedded stratigraphy that has aggraded over time. The lower facies (~7-22 m thick), composed of sub-horizontal to inclined reflections, is interpreted as a wave influenced westward (~NW-SW) progradational coastal landform. Varying coastal processes including longshore transport, changes in sediment supply, storm activity, and response to lake level changes has created Sand Point and continues to reshape the cuspate foreland.

Taylor Crist (165)
Faculty Advisor/Collaborator: Garry Running and Douglas Faulkner
*Investigating Hornblende Etching as a Relative Dating Technique in the Lower Chippewa River Valley*

The Lower Chippewa River Valley (LCRV) is similar to many large river systems throughout the US. Little is known about its geomorphic history. Although fluvial landforms within the LCRV suggest a complex geomorphic history, little is known about their age and genesis. The purpose of this research is to determine if Hornblende Etching (HE) analysis is a useful and reliable method to determine the ages of landforms present in the LCRV. Hornblende, a common heavy mineral in soils, often exhibits evidence of weathering in the form of etching. The degree of etching is assumed to be time-dependent. Theoretically, more heavily etched hornblende grains should dominate in older deposits. Particle-size analysis was conducted on sub-samples from two of seven soil pits excavated for this project. To identify 100 hornblende grains per sample, each was inspected under a petrographic microscope. Each hornblende grain observed was assigned a category (0-7 scale) based on degree of etching. The HE
method proved ineffective in the LCRV. Too few hornblende grains were recovered from LCRV soil samples, and the observed hornblende grains exhibited negligible etching. Future effort to determine the ages and genesis of landforms in the LCRV should focus on different dating techniques.

Ross Guida (157)
Faculty Advisor/Collaborator: Harry Jol and Douglas Faulkner
*Ground-Truthing GPR Profiles: Half Moon Lake, Eau Claire, Wisconsin*

Half Moon Lake (HML) contains organic-rich sediment, which is composed (at least in part) of industrial waste generated by the logging industry of the past. This research builds upon earlier projects that used a global positioning system (GPS) and ground penetrating radar (GPR) to create a thickness map of organic-rich sediment in HML. The specific objective of the research was to ground-truth GPR profiles in order to assess the accuracy of the original map and the estimated sediment volume in Half Moon Lake. To achieve this objective, cores of lake sediment were obtained using a vibracoring system when the lake was covered with ice. These cores were subsequently split and analyzed at the National Lacustrine Core Repository (LacCore) at the University of Minnesota to determine the amount of organic-rich sediment in each core. Based on the coring data, the thickness of organic sediment in HML appears to range from one to three (or more) meters, which corresponds well to the sediment thickness map created from GPR data. Site-specific discrepancies do, however, exist between the core data and the sediment thickness map. Thus, ground-truthing is necessary to improve the accuracy of the map and to estimate organic sediment volume.

Nicholas King and Amy Wichlacz (158)
Faculty Advisor/Collaborator: Douglas Faulkner
*Planimetric Channel Change along the Lower Chippewa River in West-Central Wisconsin, 1938-2008*

The Chippewa River, a major tributary to the Mississippi River in west-central Wisconsin, appears to be an exceptionally dynamic stream. This seems particularly true of the river downstream from Eau Claire, as suggested by numerous abandoned channels and bars of fluvial sediment found far from the present active channel. In this research, our objective was to identify and quantify recent planimetric channel change along a 52-km reach of the lower Chippewa River. To accomplish this, we used aerial photographs taken between 1938 and 2008 as base maps and, in ArcMap, digitized the river's active channel. From the digitized active channels, we generated a time series of maps illustrating 70 years of planimetric change. These maps clearly reveal significant change along anabranching sections and relative stability along single-channel meandering sections. The digital maps of the active channel also enabled us to quantify changes in channel planform over the period of study. The most notable planimetric change was a progressive decline in the surface area of the active channel, from 14.2 km² in 1938 to 10.1 km² in 2008. The cause of this decrease, which exceeds 28%, is presently unknown, although flow regulation by upstream dams seems a likely contributing factor.

Bethany Nelson (159)
Faculty Advisor/Collaborator: Christina Hupy
*Mapping Land Use Land Change in the Lower Chippewa River Valley between 1938 and 2005*

The Lower Chippewa River Valley provides a wealth of habitat for a variety of fish and wildlife species as well as recreational opportunities and supports a significant amount of agricultural land. Despite the importance of the Lower Chippewa River and its surrounding habitat, relatively little is known about the dynamics of this system. The objective of this project is to contribute to a better understanding of the dynamics of the Lower Chippewa River and its immediate watershed by mapping changes in land use land cover with emphasis on vegetation cover. Aerial photographs from 1938 to 2005 were obtained and georeferenced. Land use land cover classes were interpreted and digitized in ArcGISTM 9.2 based on the aerial photos. Standard Anderson level II classes were used for the majority of the study area; vegetation was broken down into prairie, savanna, woodland, forest, and marsh. Statistical comparisons were then made across the years including change in acreage of lowland forest and farmland, and overall change of each land use class. The results indicate significant land use land cover change in several classes. The
results will be used to gain a better understanding of the temporal and spatial dynamics of the Lower Chippewa River.

Laura Tucker (163)
Faculty Advisor/Collaborator: Harry Jol
A Comparison of Ground Penetrating Radar Profiles and Photographed Trenches, Sand Point, Michigan

The National Park headquarters of Pictured Rocks National Lakeshore is located at the tip of a cuspate foreland feature known as Sand Point. The building is housed in a former Michigan Coast Guard Post and is registered as a Historic Landmark. During high water levels of Lake Superior, coastal erosion and basement flooding have become a problem. The purpose of this project is to use high frequency (900 MHz) ground penetrating radar (GPR) data to provide detailed resolution of the subsurface to 1) compare the profiles to a panoramic series of photographs along dug trenches, and 2) image an actively accreting beachface on an offshore bar. Along the northeast shore of Sand Point, two trenches (t-shaped) were dug ~1m deep and ~5-6m long. The comparison of the GPR results (~1.2m thick) and photographic images show similarities in the observed reflection patterns and stratigraphy of beach sediment. On the offshore bar the GPR profile showed an accretionary pattern (~60cm thick) with reflections dipping in a northeast direction with an overwash deposit. The results of the project have shown that the GPR profiles and associated trenches can aid the National Lakeshore to better understand the subsurface sediment deposits of Sand Point.

Benjamin Young and Danielle Swartz (156)
Faculty Advisor/Collaborator: Garry Running and Douglas Faulkner
Soils and Subsurface GPR Imaging of Fluvial Terraces in the Lower Chippewa River Valley, WI

Stream terraces in the Lower Chippewa River Valley (LCRV) suggest a complex history of aggradation and downcutting. While LCRV terraces have been mapped, nothing is known about their age and chronostratigraphic relationships. The purpose of this research is to determine if GPR and soils can be used to address these knowledge gaps. Twenty-seven GPR transects were collected across five terraces imaging the subsurface (pulseEKKO 50, 225MHz). GPR depth of penetration ranged from 1 to 20 m. Two reflection patterns were observed and interpreted: 1) continuous to semi-continuous, horizontal to sub-horizontal (interpreted as lateral migration following episodes of incision) and 2) continuous to discontinuous, sub-horizontal to inclined (interpreted as one episode of aggradation). Seven soil profiles were also described and sampled. Observed morphology of the profiles (weakly expressed, sandy Inceptisols, often underlain by clast-supported gravels, with Bw horizon development decreasing systematically from high to low terraces) was consistent with GPR data. Results suggest a braided stream environment, with initial aggradation followed by lateral migration between episodes of incision. Control on terrace age is needed to confirm this model. In the future, multiple OSL sample pairs from all terraces will be needed to determine the age of aggradation and incision.

Geology

Elizabeth Balgord (118)
Faculty Advisor/Collaborator: Brian Mahoney and Robert Hooper
Examining the Genesis of the Middle Devonian NiMo deposit, Selwyn Basin, Yukon

There is a high grade nickel-molybdenum (NiMo) sulfide deposit in northeastern Yukon that occurs at the boundary between the Ordovician-Early Devonian Road River and Middle to Late Devonian Earn Group. The NiMo mineralization was originally interpreted to have been deposited by hydrothermal brines migrating in the shallow subsurface in a small (<100 km$^2$) fault-bounded volcanogenic basin. However recent geologic mapping suggests this deposit is far more extensive, covering most of the Selwyn basin (>100,000 km$^2$), with an average thickness of 3-8 cm. Detailed stratigraphic studies, geochemical analysis, and scanning and transmission electron microscopy have identified distinct elemental concentration gradients and mineral alteration assemblages. The main mineral assemblages consist of
vaesite (NiS₂), millerite (NiS), bravoite [(Fe,Ni)S₂], pyrrhotite (Fe₁₋ₓS), and pyrite (FeS₂), with an average
Nickel grade of 5%. The stability of bravoite shows that the maximum temperature of precipitation was
137°C. The broad areal extent, lateral continuity, restricted mineralogy and apparent microbial influence
suggest a two-stage basin-wide mineralizing event that may represent a new, potentially significant type
of economic mineral deposit. Ongoing investigations will constrain the biologic, climatic, oceanographic
and tectonic controls on the genesis of this deposit, and permit a realistic evaluation of the system's
economic potential.

Elizabeth Balgord, Julia Potter, Carrie Weiss, Nathan Heuer and John Wrass (107)
Faculty Advisor/Collaborator: Brian Mahoney and Lori Snyder
Geologic Exploration of the Northern Central American Arc: A Transect from the Guatemalan Highland
into the Back Arc Rainforests

Guatemala is composed of the Maya and Chortis Blocks, which consist of Proterozoic and Paleozoic
basement terranes that have been intruded by subduction-related magmas since the Mesozoic. The
blocks are separated by the left lateral Motagua strike-slip fault system that links to the east with the
Cayman Trough. The topographic and volcanic evolution of the region has been impacted by several
major events over the last 25 Ma. The breakup of the Farallon Plate into the Cocos and Nazca plates at
23 Ma increased the convergence rate and changed the angle of subduction leading to enhanced
volcanic activity from 23-10 Ma, followed by slab-break off that led to asthenospheric upwelling and major
uplift of the Guatemalan Arc. The modern Central American Arc initiated ~4 Ma and consists of thirty-nine distinct clusters of cones, domes, calderas, and vents with seven main volcanic centers dispersed
evenly across the arc. The volcanics vary geochemically along strike, due to variations in crustal
thickness and angle of subduction. Three active volcanic edifices (Pacaya, Fuego, San Pedro),
representing about 100 km of arc length, have been geochemically analyzed to evaluate spatial and
temporal variations in magma chemistry.

Elizabeth Balgord, Julia Potter, Michelle Forgette and Nicholas King (108)
Faculty Advisor/Collaborator: Brian Mahoney, Phillip Ihinger and Geoffrey Pignotta
Geological Analysis of the Northern Margin of the Boulder Batholith: An EdMap Project

Southwest Montana experienced large-scale magmatism and regional contraction during the Late
Cretaceous. Understanding the genetic linkages between these geologic processes is important for
understanding the causes of mountain-building in the Cordillera. The relationship between the plutonic
rocks of the Boulder batholith, the coeval volcanic rocks of the Elkhorn Mountain volcanics, and the
folding and thrusting associated with foreland contraction is the subject of ongoing debate. Part of the
debate is the result of incomplete field relations. We present detailed mapping of the Elliston and
MacDonald Pass 7.5 minute quadrangles situated on the northern margin of the Helena salient, near the
juncture between deformed Paleozoic strata, the voluminous intrusive rocks of the batholith, and the
overlying volcanic rocks. Our analysis of the field relationships between the Boulder magmatic system
and the folded Paleozoic rocks constrain the sequence of events that shaped the tectonomagmatic
evolution of the Helena salient.

Elizabeth Balgord (117)
Faculty Advisor/Collaborator: Brian Mahoney and Phillip Ihinger
Reinterpreting Cambrian Paleogeography, Southwest Montana

In southwest Montana, the Belt Supergroup consists of fine-grained siltstone and shale of the Spokane,
Empire and Greyson Formations. These rocks are overlain by the Cambrian Flathead Sandstone, which
is a prominent, cross-stratified quartz arenite that stands in bold relief to the underlying recessive Belt
rocks. The contact between these two packages is mapped as a profound unconformity, but recent
mapping suggests the contact is a conformable, coarsening upward gradational transition. Provenance
analysis demonstrates that these units have very different detrital zircon (DZ) populations: samples of the
Spokane Shale (n=4) yield a major DZ population of 1.45-1.60 Ga, which corresponds to the North
American magmatic gap and suggests derivation from a western cratonic source. The overlying Flathead
(n=5) yields distinct peaks at 1.7-1.8 Ga, 2.6-2.7 Ga and 2.9-3.1 Ga. Mapping documents that red siltstone and shale of the Spokane Formation is intercalated with thin beds of coarse-grained quartz arenite and overlain by quartz arenite of the Flathead sandstone. These red strata yield a DZ population typical of the Spokane Formation, and the sandstones yield a typical Flathead DZ signature. The intercalation of the two distinct zircon populations strongly suggests that rocks mapped as the Spokane Formation are Cambrian in age.

**Nicholas Borchardt (131)**
Faculty Advisor/Collaborator: **Katherine Grote**
*Geophysical Site Characterization for Groundwater Remediation at a Chemical Recycling Center in Eau Claire, WI*

In this project, geophysical techniques were used to aid in groundwater remediation at the Waste Recycling and Research (WRR) chemical reclamation and recycling center in Eau Claire, WI. Underlying the WRR site are two unconsolidated aquifers, an overlying unconfined aquifer and a deeper confined aquifer. Chemicals have been detected in both aquifers, but the highest concentrations are found in the deepest wells in the lower aquifer, indicating that dense contaminants may be ponding at the bottom of this aquifer. The lower boundary of the confined aquifer is a sandstone unit, but the bedrock surface is highly irregular. To better remediate this aquifer, the depth to bedrock at different locations must be determined. In this project, we used four geophysical techniques to help determine the depth to bedrock. We collected data using seismic refraction, resistivity, electromagnetic, and gravity methods and integrated these data with boring logs to better characterize the depth to bedrock across the site.

**Giselle Conde (109)**
Faculty Advisor/Collaborator: **Phillip Ihinger**
*Water Speciation in Natural Obsidian: Two Thermal Regimes of Hydration*

Supervolcano eruptions represent some of the most dramatic events in the geologic history of our planet. They form as a result of volatile exsolution from a viscous silica-rich melt structure. As water is the dominant volatile released in these eruptions, it is essential that we understand the solubility and speciation of water in felsic melt. We have conducted micro-FTIR analyses on a suite of 30 obsidian flows from Anatolia. Our measurements delineate two series of glasses that reflect two distinct processes involved in hydrous species equilibration. One series, with total water contents > 5 wt% and H$_2$Omol > OH, shows equilibration temperatures ranging between 150-250°C. The second series, all with H$_2$Omol < OH and total water < 2.5 wt%, shows an average equilibration temperature of 490°C. These data are consistent with the high-water glasses having experienced low-temperature hydration and the low-water glasses having experienced little, if any, hydration after eruption; their water contents reflect the quenched magmatic water content. Future H and O stable isotope measurements will test our conclusions. Our results have implications for both sourcing and hydration rim dating of obsidian artifacts.

**Taylor Crist, Bryan Hardel, Brennan M. Kadulski, Troy Moseley and Alex Thompson (94)**
Faculty Advisor/Collaborator: **Brian Mahoney and Lori Snyder**
*Exploring Belize and its Barrier Reef: Formation, Ecosystem, Culture, and Human Influence on the Reef*

The Mesoamerican Reef is the largest reef system in the Western Hemisphere. The origin and evolution of the Belize Barrier reef in the southern portion of this system is strongly controlled by local tectonics along the boundary between the North American Plate and the Caribbean Plate. Along this boundary, a northeast trending left-lateral strike slip fault causes extensional normal faulting along the eastern coast of Belize and extends northeast into the Caribbean Sea, forming a deep trench known as the Cayman Trough. This structural setting created topographic control, which localized reef growth, producing all major reef types (fringing, barrier and isolated platforms). Belize contains particularly high biodiversity for the region, with about 65 coral species and over 300 fish species, compared with just over 70 coral species and about 520 fish species in the entire Caribbean. Belize’s reef system has been a vital source of food and protection from storm systems for the local population throughout history, and in recent times
has provided economic stability through international tourism. However, human interaction, including siltation and agricultural runoff, along with natural threats such as climate change and hurricanes, pose extreme threats to the stability of the reef’s sensitive ecosystem.

**Bryan Hardel (84)**  
Faculty Advisor/Collaborator: **Geoffrey Pignotta**  
*Geochemical, Structural and Economic Mineral Characterization of a Sequence of Paleozoic Volcanic Rocks near Terrace, British Columbia*

Recent geologic mapping in the Terrace area, British Columbia identified a deformed and metamorphosed sequence of Paleozoic volcanogenic and marine sedimentary strata with potential for economic mineralization. Geologic mapping and sampling characterized lithologic variations, geometries and structures in the region. Field and geochemical data within a 200m pseudo-stratigraphic section show that volcanic units within the section range from basaltic through rhyolite with andesitic and rhyolitic compositions most common. Intercalated within the package are several biotite schist layers, interpreted to have a sedimentary origin. Mapping revealed unique characteristics in the section, including large (0.2-0.8 mm), anhedral, lavender quartz phenocrysts/clasts typically within felsic volcanics. Sulphide mineralization, in the form of disseminated pyrite and chalcopyrite was also observed and trace element geochemistry shows elevated Cu concentrations, locally. The sequence is steeply tilted to the north and variably deformed. Volcanic units have weakly developed foliation parallel to steep lithologic layering while schist lenses have a well developed, steep foliation defined by biotite. Steep brittle faults cut the entire package and are interpreted to be significantly younger than ductile deformation. Mapping, geochemistry and mineralization of the pseudo-section suggest an extensional island arc setting, which is favorable for volcanogenic massive sulphide deposit formation.

**Bridget Kelly, Bryan Hardel, Troy Mosley and Jacob Heimdahl (93)**  
Faculty Advisor/Collaborator: **Katherine Grote**  
*Evaluation of Air-Launched GPR Techniques for Efficient Soil Moisture Estimation*

Air-launched Ground Penetrating Radar (GPR) techniques have potential for efficient estimation of water content in the shallow subsurface over large areas. In this experiment, we investigate the efficacy of air-launched GPR techniques for estimating soil water content and the penetration depth of air-launched waves under saturated and dry conditions in both sandy and organic-rich soils. The experiment was performed in a large tank under controlled climatic conditions using 250-, 500-, and 1000-MHz antennas. Data were acquired over saturated sand, dry sand, saturated organic loam, and dry organic loam. For all air-launch data, the dielectric constant was determined using the amplitudes of the reflection from the soil surface, and a petrophysical relationship was used to convert the dielectric constant to water content. Data analysis is ongoing, but preliminary results indicate that water content can be estimated with reasonable accuracy in both saturated and dry soils, although some frequencies tend to overestimate the water content in dry soils. The penetration depth of the air-launched waves was approximately 6 to 9 cm for all frequencies regardless of soil texture or moisture.

**Bridget Kelly, Anne Gauer and Anna Baker (92)**  
Faculty Advisor/Collaborator: **Bianca Pedersen**  
*Investigation of Groundwater Geochemistry and Seepage Rates to Determine Domestic Nutrient Input into Eutrophic Lake Altoona, Wisconsin*

Lake Altoona, an impounded lake created by the damming of the Eau Claire River, has exhibited eutrophication problems largely attributed to agrochemicals transported via inflow from the Eau Claire River. The lake is also surrounded by several hundred homes with septic systems. Research conducted at Lake Altoona has revealed several areas of groundwater influx along the lakeshore that may serve as possible sites of domestic nutrient influence into Lake Altoona. This study aims to determine both the chemical composition of ground and surface waters surrounding Lake Altoona and quantify groundwater influx into the lake. During summer/fall 2008, surface water samples were collected weekly to biweekly where the Eau Claire River flows in and out of the lake. Groundwater samples were collected at a
number of spring locations along the lakeshore with minipiezometers and seepage meters were placed in multiple locations along the lakeshore. Chemical analyses were used to determine the significance of domestic-derived nutrients on lake water chemistry and groundwater influx rates were determined from seepage meter data. Measurements of electrical conductivity, dissolved oxygen, and pH were performed in the field, and $\text{NH}_4^+$, $\text{NO}_3^-$, $\text{PO}_4^{3-}$ and major and minor ion concentrations were determined in a laboratory.

Crystal Nickel, Anna Baker and Taylor Crist (142)
Faculty Advisor/Collaborator: Katherine Grote
Determination of the GPR Groundwave Penetration Depth in Saturated and Dry Soils

Ground Penetrating Radar (GPR) groundwaves have great potential for soil water content estimation, but application of groundwave techniques is currently limited by uncertainty surrounding the groundwave penetration depth. This project experimentally determines the penetration depth as a function of GPR frequency, soil moisture conditions, and soil texture. Data for this experiment were acquired under controlled conditions in a large tank. A 20-cm layer of homogeneous, saturated sand was placed in the tank and was hydraulically sealed. Variable-offset GPR data were collected over the saturated sand using 100-, 250-, 500-, and 1000-MHz antennas. Then, incremental 3-cm layers of dry sand were placed over the saturated sand, and GPR surveys were acquired after each layer was added until the groundwave velocity ceased to change with additional layers of dry sand. The depth of dry sand where the velocity became constant is assumed to be the groundwave penetration depth. This procedure was repeated using dry sand overlain by incremental layers of saturated sand. Finally, both of these experiments were repeated using an organic-rich soil. Preliminary results show that penetration depth is not strongly dependent upon soil moisture, but it does vary with frequency, with lower frequencies having the greatest penetration depth.

Christopher J. Olson and Brennan M. Kadulski (116)
Faculty Advisor/Collaborator: Phillip Ihinger
Granite-Gabbro Relations in the Mineral Lake Intrusive Complex

The Mineral Lake Intrusive Complex (MLIC) is a Layered Mafic Intrusion (LMI) located in northeastern Wisconsin. Granitic and gabbroic rocks are intimately associated in the MLIC, with each rock type often containing inclusions of the other. The relationship of these two magma types is the subject of some debate among geologists. Recently, we have developed an alternative model for the origin of granite in LMIs. The model holds that both the granitic and gabbroic rocks were derived from a common parent magma that experienced liquid immiscibility as crystallization proceeded. We suggest that as the parent magma cools, magma trapped within the crystalline framework evolves to Fe-rich compositions as Mg-rich minerals are removed. Eventually the evolved magma becomes saturated in a silica-poor, Fe-rich ‘sludge’ that quickly segregates from a residual silica-rich melt. The dense Fe-rich liquid sinks deeper into the crystal mush, whereas the buoyant granitic liquid migrates up through the overlying basaltic magma chamber. The granitic liquid either escapes to the surface to become rhyolite or is emplaced within overlying rocks as dikes, sills, and pods of granite. Here we examine the major and trace element variations of MLIC rocks to test this model for the origin of granite.

Julia Potter (83)
Faculty Advisor/Collaborator: Lori Snyder and Brian Mahoney
Geochemical Characterization and Geochronology of the Avon Volcanic Complex, Southwestern Montana

The Avon Volcanic Complex (AVC) is a suite of felsic rocks located within a small (90km$^2$) fault-bounded basin between the towns of Avon and Elliston in southwestern Montana. The AVC is related to the widespread Eocene-Oligocene volcanic province exposed throughout the northern Rocky Mountains and consists primarily of crystal rich lava flows and volcanic domes with an unusually small amount of pyroclastic material for this composition. Trombetta (1987) mapped and sampled the AVC, dividing the rocks into seven lithologic units and provided major-element geochemical data and limited age
constraints on the magmatic evolution. This investigation is designed to constrain the geochemical evolution of the AVC. Twenty-five representative samples from the seven recognized units have been collected for analysis. The samples have been analyzed using the UW-Eau Claire Department of Geology’s state of the art geochemical laboratory. Major and minor element data are measured by X-ray fluorescence spectroscopy (XRF) and rare earth element data are measured using high resolution inductively coupled plasma mass spectrometry (HR-ICPMS). Detailed geochemical data will help in interpreting the magmatic evolution of the Avon volcanic complex, and will add to the understanding of the evolution of the Eocene-Oligocene Rocky Mountain volcanic province.

Daniel J. Steltz and David Kawatski (140)
Faculty Advisor/Collaborator: Phillip Ihinger
Two Stage Growth Evolution of Hydrothermal Quartz: Impurities Tell the Story

Large-scale hydrothermal fluid systems control the thermal evolution of Earth’s crust. Quartz crystals, the primary product of circulating aqueous fluids, contain chemical impurities that document their growth history in hydrous environments. High-resolution FTIR measurements show that natural quartz crystals are composed of sector zones characterized by distinct concentrations of hydrous impurities. Some hydrothermal environments produce crystals characterized by growth on only the six terminal rhombohedral faces. Here, we document the distribution of defect abundances in crystals extracted from a single vug from Le Chang City, Guangdong Province, China that record two distinct phases of growth. Each crystal contains: (1) an inner core, with elevated AlOH and intermediate LiOH and HOH concentrations; and (2) a thick rim with LiOH and HOH > AlOH. Rim thickness remains constant up the length of the crystal, and `concentric’ twin bands indicate that this second stage of growth served to ‘coat’ the pre-existing core on both terminal and prism faces. The cores show classic diffusion profiles toward the contact with the rims, and suggest the cores had fully grown before the AlOH-poor coating was added onto their respective m faces. This phenomenon appears to have impacted all of the crystals within the same vug.

Sarah A. Ulrich (133)
Faculty Advisor/Collaborator: Phillip Ihinger
Penetrative Convection in Earth’s Mantle: A Test Using Whole-Earth Geochemical Model

The nature of mantle convection within the Earth remains one of the most important unanswered questions regarding Earth evolution. Two competing theories have been proposed, one backed primarily by geochemists invoking two separately convecting homogeneous upper and lower reservoirs, and the other backed primarily by geophysicists invoking a single incompletely stirred reservoir. The recently proposed Penetrative Convection Model offers a reconciliation of the two perspectives and is consistent with the first-order constraints provided by geochemists and geophysicists. The model suggests that the phase change occurring at 670 km depth serves to prevent some sinking slabs from mixing into the lower reservoir, but allows others to cross through the barrier and descend to the D” layer at the bottom of the mantle. Here we present whole-Earth geochemical models that apply the dynamics of the Penetrative Convection Model and follow the geochemical evolution of the upper and lower mantles. We constrain the amount of mixing that is required to develop the geochemical signatures observed in the two reservoirs today, and in particular, we show that the Penetrative Convection Model is consistent with observed geochemical variations seen in mantle-derived magmas around the globe.

Geology, Geography and Anthropology

Audrey Mohr and Isaac Orr (132)
Faculty Advisor/Collaborator: Kent Syverson and Harry Jol
GPR Survey of the Blue Hills Felsenmeer, Wisconsin: Profile of a Relict Talus Slope

The Blue Hills Felsenmeer State Natural Area in Rusk County, Wisconsin, is a unique, 25 m deep valley lined with angular quartzite boulders. The valley displays a convex longitudinal profile with two crests at
the midpoint rising up to 9 m above the adjacent valley floor. The purpose of this study was to determine if the valley is a felsenmeer (bedrock shattered in place) or a talus (rock fall deposit), as proposed by Thompson and Syverson (2006). A ground-penetrating radar (GPR) survey was conducted to determine the valley origin and reveal if the convex longitudinal profile is caused by a thicker accumulation of boulders near the valley midpoint (Thompson and Syverson, 2006). Laser level elevation data was used to correct the reflection profile for topography. The GPR survey shows a continuous, westerly dipping reflection between the open-work boulders and underlying intact quartzite and provides conclusive evidence the Blue Hills Felsenmeer is a talus deposit. Boulder depths above the contact range from 1 to 9 meters. After glacial meltwater eroded the box-canyon valley, rocks fell onto the valley floor, and the greatest thickness accumulated in the narrowest part of the valley. This formed the crest near the valley midpoint.

Isaac Orr and Audrey Mohr (141)
Faculty Advisor/Collaborator: Kent Syverson and Harry Jol
Sedimentology of the Blue Hills Felsenmeer State Natural Area, Wisconsin

The Blue Hills Felsenmeer valley in Rusk County, Wisconsin, trends east-west, is 25m deep, and is 300m long. The valley walls slope at 25° and are strewn with angular quartzite boulders. Steep slopes suggest a rock-fall (talus) origin for the block field rather than freeze-thaw processes acting in situ (the process of felsenmeer formation). The purpose of this study is to examine the sedimentology of the block field and assess whether it is a felsenmeer or talus deposit. The sedimentology of the Felsenmeer was studied during ten field days. Nine grain-size distributions (n = 306 to 520) were determined by tossing a rope over the blocks and measuring rock diameters in contact with the rope. Median clast diameters are larger near the valley floor. Higher elevation zones have median clast sizes of 25cm and 35cm compared with areas directly below exhibiting median clast sizes of 35cm and 45cm, respectively. The southern wall has larger, more tabular clasts (45cm median diameters). Sediment sorting within the Felsenmeer suggests that the Blue Hills Felsenmeer is not in situ material and not a true felsenmeer. The sorting and steep block-field slopes indicate a rock-fall deposit.

Geology and Physics and Astronomy

John A. Peterson (85)
Faculty Advisor/Collaborator: Phillip Ihinger and Paul Thomas
Slab Penetration into the Lower Mantle: A Theoretical Construction

The behavior of subducting oceanic slabs at the boundary between the lower and upper mantles is important because mixing across this boundary controls the chemical evolution of the two reservoirs. A geophysical barrier to the penetration of materials from above into the lower mantle below is established where silicon in four-fold coordination is transformed to a more dense phase with silica in six-fold coordination. Because this transformation is endothermic, an object which is cooler than the Earth’s geotherm must penetrate deeper before it has sufficient energy to undergo the transformation. This requires the slab to penetrate some distance into the higher density six-coordinated regime. In this study, we constrain parameter spaces on the physical properties of the lower mantle that allow for slab penetration. By starting with a simple, homogeneous block of slab material, it is possible to determine the temperature regimes under which it will spontaneously penetrate the boundary. To do this, the theoretical model uses the equations of state for common oceanic slab materials and their higher coordinated counterparts, the Clapeyron slope, and reasonable initial conditions. Each of these factors has several variables which we adjust to determine the sensitivities to select conditions.
Learning and Technology Services, Physics and Astronomy, and Geology

Jason Garcia (272)
Faculty Advisor/Collaborator: Thomas Paine, Paul Thomas and Phillip Ihinger
Installing the Finite Element Code CITCOM-S on the UWEC Computing Cluster

We discuss the installation and test of a geophysical fluid dynamics code Citcom-S on the UWEC computing cluster. Use of the cluster's multiple nodes and performance of the cluster compared to a single processor system is discussed. The application of the Citcom-S program will be to modeling of convection in the Earth's mantle.

Mathematics

Mark Bauer and Kaitlyn Hellenbrand (19)
Faculty Advisor/Collaborator: Bob Andersen
Construction of Lichtenwasser Numbers

Historically, the construction of numbers using the Zermelo-Fraenkel Axioms for set theory has had to work around a problem of ordinal arithmetic: noncommutativity. Through a newly created definition of addition and multiplication using polynomial arithmetic, one can define a commutative arithmetic on countable ordinal numbers, and thus create new systems of natural numbers, integers and so on. This poster will demonstrate how to build Lichtenwasser numbers, which are these numbers defined by polynomial arithmetic, and show how to create new number systems from them.

Mark Bauer, Kaitlyn Hellenbrand and Emily Klungtvedt (14)
Faculty Advisor/Collaborator: Simei Tong
Optimizing the Evacuation of Hospitals

During an emergency, evacuation must take place quickly. One of the more complicated emergency situations arises in the setting of a hospital. This poster displays a mathematical model for the optimal evacuation of a hospital. Using data from Luther Midelfort Hospital/Clinic in Eau Claire, Wisconsin and the Eau Claire Emergency Management office, a transportation model was created to find the most efficient way to evacuate the hospital. Excel was utilized to solve the transportation model using the Simplex Method. The optimal solution was tested by the researchers, and then presented to hospital administrators, who applied it to their emergency plan. This model can be modified to apply to numerous situations.

Jacqueline Christy (16)
Faculty Advisor/Collaborator: James Walker
New Method in Cryptography

When transferring a message that may be intercepted by a third party whom you do not wish to know the content of the message, it is important to encrypt the alphanumerical data of the message with an algorithm that cannot be broken; that is, it cannot be decoded. Because the use of frequency analysis to decode messages is a common form of decryption, it is vital to protect against it. When using frequency analysis to attempt to decode a message, a person links the frequency with which numbers appear in the encoded message to the common frequencies with which different letters and symbols appear. Therefore, in order for an algorithm to be protected, there must be no connection between the frequency of symbols in the encoded message and those in the original message. Previously, we devised an algorithm to encode messages using wavelet transforms and random alterations of the values. We have
now removed all the bugs from the algorithm and studied its performance while encrypting different sets of alphanumerical data. The results we received indicate that the method may be secure against frequency analysis attempts at decryption.

Christian N. Cortner (17)
Faculty Advisor/Collaborator: James Walker
New Methods in Algorithmic Music

A new method in algorithmic music was investigated. A method for automatically generating melodies was developed. It uses a combination of random selection based on mathematical number sequences. Initial work was done on creating software that implements this automatic method.

Sara Grassel (39)
Faculty Advisor/Collaborator: Jessica Kraker
Exploring Epidemiology on Campus

In terms of education and information for UW-Eau Claire students, sexual health is a topic relevant to improving the quality of their college experience. We have examined behaviors associated with sexual health and how to advocate such behaviors. Assessment was performed by the UW-Eau Claire Student Health Service (SHS) during April 2007; a survey designed by the American College Health Association (ACHA) was administered to a random sample of currently enrolled students. Our contributions to this project included developing clear research questions (prior to examination of the data), summarizing (tabulating) the data, checking for missing information or errors, selecting the appropriate method for analysis, running the appropriate computational tools, and finally writing our conclusions. Due to the nature of the survey, conclusions were made about association between variables, though cause-and-effect relationships could not be established. Inferences are applicable to the appropriate population (UW-Eau Claire students who would respond to such a health survey). Through our analysis UW-Eau Claire SHS (SHS) will be better informed of the health status of the students and can pinpoint areas of improvement in students’ sexual health. SHS in turn will provide information to the students who can positively react and hinder the issue from recurring.

Kaitlyn Hellenbrand (1)
Faculty Advisor/Collaborator: Colleen Duffy
Polynomial Equations over Matrices

If we are given an n° degree polynomial over the complex numbers, we know that it has exactly n solutions. However, this is not true for an n° degree polynomial over matrices. The difference in the two cases is that multiplication of matrices is not commutative (AB does not equal BA) and not all matrices are invertible. The question then becomes: how many solutions can exist? A result has been proved for 2 by 2 matrices. Namely, for an n° degree polynomial over 2 by 2 matrices, there are either an infinite number of solutions or any number between 0 and 2n choose n solutions. This project hopes to prove that the same result holds for 3 by 3 matrices; i.e. there exists between 0 and 3n choose n solutions. Researchers are developing different methods to approach this proof, such as through a combinatorial or linear algebra argument or by approaching the problem from a geometric standpoint.

James Hollman (42)
Faculty Advisor/Collaborator: Vicki Whitledge
Eruptions Analysis: A Study on the Relationship Between the West Triplet and Rift Geysers

Yellowstone National Park contains the world’s largest concentration of geysers. Many of these geysers occur in groups and the activity of the individual geysers affects the behavior of other geysers in the group. The Grand Group in the Upper Geyser Basin of Yellowstone National Park is an important geyser group whose individual geysers have complex relationships. Since 2003, individual geysers of the Grand Group have been regularly monitored electronically. This study analyzes the data on the eruptions of
West Triplet and Rift Geysers, two important members of the Grand Group, from 2003 through 2008. Besides a basic descriptive analysis of the data for each geyser, the relationship between West Triplet and Rift is analyzed and discussed.

Scott Larson (41)
Faculty Advisor/Collaborator: Donald Reynolds
Chaos Theory and Equicontinuity

Chaos is a recently developed mathematical theory that has proved useful in the study of dynamical systems, including weather and climate, plate tectonics, and population dynamics. There is reason to believe that chaotic behavior of dynamical systems is closely related to the idea of equicontinuity, a concept introduced in the late nineteenth century that is important in the study of spaces of continuous functions. This project explores and analyzes the connections between chaos and equicontinuity. We have found that a dynamical system that is not equicontinuous anywhere exhibits a certain characteristic of chaotic behavior.

Mitch Phillipson (3)
Faculty Advisor/Collaborator: Simei Tong
Norms in Tensor Products of Banach Spaces

We know that norms play a key role in classifying structure of Banach spaces. Tensor products are a natural and productive way to understand much of modern Banach space theory. In this poster, we will present a new definition of norm given by partitions and weights. Then we will demonstrate application of these newly defined norms for tensor products of Banach spaces and classification of some well-known spaces. We will also list some open questions.

Jessica Porath (40)
Faculty Advisor/Collaborator: Donald Reynolds
Markov Chains and Student Academic Progress II

With data obtained from enrollment records, absorbing Markov chains are used to model the academic progression of students attending the University of Wisconsin-Eau Claire over a specific period of time. Useful statistics, such as the amount of time a student enrolling in UWEC as a freshman can expect to spend before graduating, are derived from the Markov model. Similarly, the academic progression of specific groups of students based on gender and ethnicity are modeled, and the statistics derived from these models are compared with each other and the general results. With this information, the university may more accurately measure the academic progress of its students, and thus better reflect on its own institutional effectiveness.

David Rush (15)
Faculty Advisor/Collaborator: James Walker
Development of Audio Denoising

An audio denoising plug-in for the very widely used audio processor, Audacity, was developed and tested on noisy musical recordings. It outperforms Audacity's built-in denoiser. We then worked on adapting our denoising method to produce a real-time audio denoiser for hardware.

Dan Wackwitz and Lindsay Brunshidle (38)
Faculty Advisor/Collaborator: Michael Penkava
The Fundamental Theorem of Finite Dimensional Graded Algebras

The Fundamental Theorem of Finite Dimensional Algebras states that an associative algebra is either nilpotent, semisimple or a semidirect product of a nilpotent algebra with a semisimple algebra. We extend this theorem to the case of Z2-graded algebras. Wedderburn's Theorem says that a simple finite
dimensional algebra is a tensor product of a matrix algebra and a division algebra. Wedderburn also classified the division algebras over C and R. We extend these results to the $\mathbb{Z}_2$-graded case. Our main new result is the classification of $\mathbb{Z}_2$-graded division algebras over C and R. In addition to the usual division algebras, we obtain a new type of division algebra which means that the classification of $\mathbb{Z}_2$-graded algebras has some features which are not just a straightforward extension of the classical results.

Tristan Williams and Mitch Phillipson (2)
Faculty Advisor/Collaborator: Amanda Riehl
Avoidance of Colored Patterns: Wilf Classes and Enumeration

We build on previous research into pattern avoidance in colored permutations. Let A be a colored permutation of length k and let B be a colored permutation of length n. We say that B contains the pattern A if there is a subsequence of B order-isomorphic to A with identical colors. Otherwise, we say that B avoids A. The set of all A-avoiding colored patterns is denoted by $\text{Sn}_r(A)$. Two patterns C and D are said to be in the same Wilf class if the size of $\text{Sn}_r(C)$ equals the size of $\text{Sn}_r(D)$ for all n and all r. We present a conjecture on the number of Wilf classes and their associated sizes for avoiding two patterns of length three with two colors. We prove bounds on the number of Wilf classes using four bijections on colored permutations. We also prove that there are 2 Wilf classes for avoiding a single pattern of length 3 with two colors. We will also enumerate permutations avoiding a particular pattern of length three up to $n=4$. In addition, we will present several open problems on which we will continue our research.

Laurie Lee Zakrzewski (18)
Faculty Advisor/Collaborator: James Walker
Pitch Illusions in Music

We spectrally analyzed, decomposed in time and frequency, Shepard's famous pitch illusion, which is perceived as an endlessly rising scale, even though only one octave is used. We found the underlying reason for the illusion. We then found precursors of this illusion in classical music, and did spectral analyses of them.

Physics and Astronomy

David Anderson and Chris Zenner (68)
Faculty Advisor/Collaborator: Kim Pierson
Development of Polycrystalline Silicon Films for Photovoltaic Cells

The objective of this project is to develop an inexpensive technique to decrease the defects in the thin polycrystalline silicon films that are used for photovoltaic (solar) cells. Defect-free polycrystalline silicon films have the highest energy conversion efficiency but are the most costly to make. Our process involves the deposition of thin silicon films in a unique system, which allows electrons accelerated out of a plasma arc to heat the films while they are being deposited. Heat promotes large crystal growth. Our system has advantages over commercially available deposition systems with respect to the temperatures that can be achieved and the deposition rate.

Aaron Bauer (64)
Faculty Advisor/Collaborator: Paul Thomas
Determining the Mass of Saturn’s Satellite, Daphnis

In 2005, the Cassini-Huygens mission captured a picture of the Keeler gap in Saturn’s A-ring that showed a satellite (Daphnis), which seemed to cause wave-like disturbances in the inner and outer edges of the gap. The wavy motion depends highly on the mass of Daphnis and the gravitational force it exerts on the nearby ring particles. By comparing the amplitude of the waves seen in the Cassini images to those
produced in a numerical simulation, it is possible to accurately determine the mass of Daphnis. Our analysis shows a mass of $22 \pm 0.5 \times 10^{13}$ kg.

Aaron Bauer (65)
Faculty Advisor/Collaborator: Paul Thomas
Ghost Imaging Using a Pseudothalermal Light Source

Ghost imaging is a process in which an image is formed in a setup where the object and imaging detector are on separate optical paths. Thermal ghost imaging uses a pseudooral thermal light source, or speckle pattern, to illuminate two detectors, one of which images the speckle pattern and the other, the total intensity of light transmitted through the object. The detector outputs are amplified and by averaging over many speckle patterns, an image can be formed. We explore the dependence of the ghost image quality on various experimental parameters. We find that the image degrades as the speckle size decreases. We also find that scattering between the object and the detector does not degrade the image quality. We give a qualitative and short quantitative analysis of the images formed.

Katherine Bilty (63)
Faculty Advisor/Collaborator: Nathan Miller
X-ray Characteristics of the Hot Stars in Trumpler 14 and 16

We have obtained X-ray data from the orbiting Chandra X-ray observatory in order to investigate the hot stars in the star clusters Trumpler 14 and 16. Our data set consists of a number of CCD images centered on two stars in the clusters (HD93250 and HD93129). After combining our images into a master image, a major initial task was determining which sources were detected and identifying them with previously cataloged optical sources. The dimmest sources have resulted in only a handful of photon counts and are therefore at the edge of detection for the instrument, making these detections difficult. The images of the brightest stars have resulted in thousands of photon counts and we have used them to create energy spectra of these objects.

Pramod Bolakhe (66)
Faculty Advisor/Collaborator: Nathan Miller
Investigating the Wilberforce Pendulum

A Wilberforce pendulum consists of a mass hanging on a flexible helical spring that is free to oscillate in both longitudinal (lengthening) and the torsional (twisting) mode. When the moment of inertia of the mass is adjusted such that the natural oscillation frequencies of the longitudinal mode and the torsional mode are similar, the pendulum transfers energy between the two modes of oscillation. We have constructed a Wilberforce pendulum and developed an electronic system for monitoring the angular behavior of the pendulum by detecting the shadow of a pointer using photocells. In addition, we have examined the initial angular displacement and longitudinal displacements necessary to achieve the best energy transfer between the modes. Currently, we are evaluating the general functional form of the coupling term and the change in coupling constant with mass and moment of inertia.

James Bomber (67)
Faculty Advisor/Collaborator: Thomas Lockhart
Bouncing Liquid Jets

The project “Bouncing Liquid Jets” involves studying the phenomenon that occurs when viscous oil is poured into a bath of the same oil. Under the right circumstances, the incoming jet will rebound off the bath back into the air in a parabolic trajectory. In the experimental setup, vegetable oil is pumped into a long vertical tube. By varying the oil level and output nozzle size, the speed and angle of the jet can be controlled. This allows the production of mostly stable bounces with little outside interference. Using a high speed camera the bounce has been photographed and viewed at up to 600 fps. Using a photo analysis program the energy loss during the rebound has been studied. The results of this study are
presented as well as a “slingshot effect” that has been noted to occur when the bounce is disrupted.

**Cole Cook (43)**  
Faculty Advisor/Collaborator: *Lyle Ford* and *George Stecher*  
*A Comparison of Photometry Methods Using Data from Asteroids 343 Ostara and 807 Ceraskia*

Asteroids are rocky remnants of planet formation that spin and in doing so, change the amount of light seen at Earth. One part of asteroid photometry is studying this change in light and creating a light curve. Many different characteristics of an asteroid can be found when analyzing this light curve; the one we will discuss is the period of rotation. There are two different techniques that can be used to find the period, absolute photometry and differential photometry respectively. Absolute photometry requires the use of filters so the observations can be placed on a standard scale. Differential photometry does not require filters so is more sensitive to dimmer asteroids but the results cannot be easily integrated with the results of other observers. In this poster, we illustrate the advantages and disadvantages of each method using observations of 343 Ostara and 807 Ceraskia.

**Kayla Lorenzen (86)**  
Faculty Advisor/Collaborator: *George Stecher* and *Lyle Ford*  
*Photometric Reductions of Asteroids to the Standard Magnitude System*

We discuss procedures for reducing filtered measurements of asteroids to standard Johnson-Cousins R and V magnitudes. Four asteroids, 1084 Tamariwa, 2168 Erin, 2660 Wasserman, and 17010 1999 CQX, were observed in 2007 and 2008 using Bessel R and V filters. We used images of Landolt standard fields to find first order extinction coefficients, transform values, and nightly zero points. These values were used to map the instrumental magnitudes of several stars in each asteroid’s field onto the standard Johnson-Cousin scales. These comparison stars were then used as secondary standards to establish the V and R magnitudes of the asteroids. For an asteroid of V magnitude 13.9 and R magnitude of 13.5, our procedures yielded typical uncertainties of 0.015 magnitudes in V and 0.020 magnitudes in R. Our measurements also helped to determine the period of 2168 Erin and to confirm the period of 1084 Tamariwa.

**Daniel Stalker (61)**  
Faculty Advisor/Collaborator: *Kim Pierson*  
*Enhanced Lifetime of Halogen Light Tube*

The purpose of this research project was to determine why a simple modification to high intensity halogen light tubes appears to make them last longer in humid environments. This modification was discovered while using high intensity halogen lights for a research project with a local company. Halogen light bulbs are more efficient in producing light output versus electrical energy input than incandescent bulbs. Unfortunately, halogen bulbs fail faster in humid environments. A series of experiments were performed to test if the modification actually works or was simply a statistical fluke.

**Nathan Wenzel (62)**  
Faculty Advisor/Collaborator: *Nathan Miller*  
*X-ray Emissions of Wolf Rayet Stars*

Using a program called Spect 3D, I created control models of O stars, specifically Zeta Puppis, to compare with models of Wolf Rayet stars. The control models were made in a similar fashion with a three region shell surrounding the star consisting of a warm region followed by the shock region of the stellar wind and finishing with another warm region. The X-ray emissions of the winds were compared for these two types of stars. We primarily looked at the optical depth of the wind, the intensity of the emissions, and the level of oxygen ions present in the wind. A second project was also conducted. Using the parameters for the Wolf Rayet star, we looked at the the ionization edges. This allowed us to see the
points at which there was enough energy to ionize oxygen throughout the wind.

Public Health Professions and Materials Science Center

Jay Nielsen, Patty Krug, Amy Zagar and Celina Cooper (139)
Faculty Advisor/Collaborator: Crispin Pierce and Jill Ferguson
Heavy Metals in Children’s Hair

We collected and analyzed hair samples from 69 children, aged 1-18 years, for isotopes of lead, mercury, chromium, and arsenic, using an inductively coupled plasma - mass spectrometer (ICP-MS). Concentration ranges were as follows: Cr, 77-6300 ppb; Pb, 67-5800 ppb; Hg, 30-6400 ppb; and As, 0-330 ppb. Accompanying surveys collected parental information on potential sources of exposure. We found the following factors were predictive of hair metal levels: gender, elevated blood Pb, home age, remodeling, chewing on paint and toys, protective clothing, dental fillings, fishing license, chemicals in well water, knowledge of fish advisories, parental hobbies/jobs, Pb use in the home, fish consumption, and tobacco product use.
Graduate Students

Communication Sciences and Disorders

Erin Ellis and Emily Axelson (82)
Faculty Advisor/Collaborator: Lisa LaSalle
Phonological Acquisition of Children with Cochlear Implants: A Longitudinal Study

A previous study was designed to determine whether children with cochlear implants exhibit the same phonological production skills as children with normal hearing. However, there remains a question of whether the reportedly rapid rate of language progress in the early years after implantation is sustained. The purpose of this study was to investigate if children with cochlear implants continue to make gains in phonological acquisition after a period of approximately ten months. It was found that, as a whole, the group continues to make gains in phonological acquisition with great variability among the phonological processes from subject to subject.

Dana Kipp, Tania Riske and Rebecca Myers (81)
Faculty Advisor/Collaborator: Jerry Hoepner
Reliability of the Partner Behavior Support Profile

Effective and successful transitioning of persons with traumatic brain injury (TBI) back into their everyday lives and communities is linked to the presence of supports within that individual’s community settings, including close partners such as spouses, siblings, parents, and friends. Although these individuals often provide crucial supports for the person with TBI, they may find that the behaviors of the person with TBI are difficult to understand and cope with, making the relationship challenging to sustain. Effective partner training through transparent explanations and rationales is crucial in fostering sustainable, generalized treatment outcomes that will provide the necessary long-term support for the person with TBI. There are three key steps involved in achieving effective partner support: the process begins with assessing the partner’s readiness and capacity to provide support training and implementation. Despite the need for information about specific characteristics of successful partnerships, there is a gap in the literature in characterizing partner profiles for persons with TBI. While some investigations have attempted to characterize the relative strengths of partners for persons with aphasia, no investigations have characterized partner qualities for persons with TBI. The Partner Behavior Support Profile was developed to profile these partner qualities.

Information Systems

Baterdene Lkhagvadorj (105)
Faculty Advisor/Collaborator: Bruce Lo
How do we Measure the Popularity of an E-business Website? A Comparison of Top Ranking Websites by Different Providers

The popularity of a website is often judged by the amount of traffic it attracts. But the question of what is the best measure of site traffic is not simple. Should we consider the number of unique visitors (reach), the total number of visits including repeats (page views), just the number of return visits (revisits), or the average length of stay during a visit (stickiness)? The problem is further complicated by the fact that it is not possible to track the entire online population in the whole world. Most web traffic providers only track the browsing behavior of a selected sample audience. Therefore, it is difficult to know which website ranking list is the most reliable. This paper examines several “top-100 most popular website” ranking lists from a number of providers to determine how the ranks may be affected by the metrics used in web traffic measures.
Baterdene Lkhagvadorj (106)  
Faculty Advisor/Collaborator: Bruce Lo  
What are the Browsing Preferences of World Online Population? An Examination of the Differences among Top-ranking E-business Websites from Different Countries

The World Wide Web has experienced explosive growth during the past two decades. One reason for this wide acceptance is because the Internet enables individuals to reach out to the entire world. As a result, the Internet also created a unifying influence which permeates all online audiences regardless of their country of origin. This paper examines the top-ranking websites from different regions of the world to discover to what extent online audiences from different regions of the world show common and/or distinctive browsing preferences.

Management and Marketing

Sheila Miller (95)  
Faculty Advisor/Collaborator: Kristy Lauver  
Tell Me a Story: Examining Business Students’ Narratives Surrounding Alcohol

College of Business students were asked to provide the researchers with a “story” about recent experience(s) they had encountered involving alcohol. The narratives were then examined looking at context, pronoun usage, and discourse. Inserting of values and personal possession versus distancing from the situations are discussed, as well as various characteristics of students that impacted the narratives. Findings are discussed in terms of implications for students, universities, peers, co-workers, and organizations.

Psychology

Jessica Bondhus (96)  
Faculty Advisor/Collaborator: Mary Beth Leibham  
Diagnostic vs. Social Labels: How do They Influence the Perceptions of Peers?

Research suggests that labels affect the way people perceive those who are labeled. Questionnaires were distributed to participants in third, fifth, and eighth grade. Each participant received one of five conditions that described a hypothetical peer. Each condition positively described the hypothetical peer identically except for one line which included one of the following attributes: smart, is in the gifted and talented program, has a really hard time learning, has a learning disability, or no label, to act as the control. Participants were then asked to answer various academic and social questions thinking about this hypothetical peer. This project remains in progress and results have not yet been assembled.

Brad Dickey (79)  
Faculty Advisor/Collaborator: Daniel Holt  
Comparison of Two Supplementary Reading Interventions: Outcomes of Students at Risk for Reading Failure at an Elementary School Using Direct Instruction, DIBELS AND SARF

Failure to develop basic reading ability during the first few years of school has been shown to be related to a number of academic, economic, and socio-emotional problems. As a result, it is very important to research the effectiveness of different reading programs and their ability to improve students’ reading abilities. This study examined the relative effectiveness of Direct Reading Instruction (DI) and supplementary individualized reading instruction at an elementary school in promoting reading fluency among second grade students At-Risk for reading failure. This study also conducted an exploratory analysis of reading behaviors to examine reading errors between supplementary instructional models. Reading instruction occurred in a classroom four times a week, for 30 minutes during each instructional period. Twelve At-Risk participants who all exhibited At-Risk performance on DIBELS (Dynamic Indicators
of Basic Early Literacy Skills) Oral Reading Fluency participated. Six participants received supplementary DI and 6 participants received supplementary individualized reading instruction. Outcomes were measured using DIBELS and SARF (Subskill Analysis of Reading Fluency). Results displayed that there was not a significant difference between instructional models, but there was a significant difference within both instructional models over time.

**Brad Dickey and Paula Hoffert (80)**
Faculty Advisor/Collaborator: Michael Axelrod
*Treating Nocturnal Enuresis using Contingency Management and an Auditory Urine Alarm*

Nocturnal enuresis is defined as the repeated display of voiding urine into bedclothes (whether involuntary or voluntary). It is estimated that nocturnal enuresis is one of the most common problems encountered in pediatrics (Young & Primack, 1996). The present study examines the effects of using contingency management procedures (i.e., incentive system for dry nights) and DBT (dry bed training) with an auditory urine alarm on reducing the frequency and intensity of nocturnal enuresis. The participant was an 11-year-old boy who had a history of frequent nighttime accidents. Results suggest that contingency management coupled with DBT and an auditory urine alarm have an immediate and dramatic positive effect on nocturnal enuresis.

**Ian Halberg (97)**
Faculty Advisor/Collaborator: Mary Beth Leibham
*Results from an Evaluation of a School District’s Student Support Team Effectiveness*

This research was undertaken to investigate the conditions under which a school district’s Student Support Teams (SST) met the National Association of School Psychology’s (NASP) best practices standards for pre-referral intervention teams. This research also evaluated the effectiveness of the SST process as perceived by SST members. Eight hundred and sixty-two SST members were e-mailed a survey that evaluated the SST process. The hypotheses were that the school district would meet some of the standards of NASP for their SST process and that SST specialists (school counselors, school psychologists, social workers, speech-language clinicians) will find the SST process more effective than teachers would.

**Paula Hoffert (98)**
Faculty Advisor/Collaborator: Barbara Lozar
*The Quality of Teacher-Student and Home-School Relationships in Black and White Students in West-Central Wisconsin*

The Black-White Achievement Gap is a well-documented phenomenon, but factors contributing to the achievement of Black students in the state of Wisconsin have not been adequately researched. Questionnaires assessing the quality of teacher-student interactions were administered to White and Black students in elementary, middle, and high school. Parents of these students also completed questionnaires measuring the quality and frequency of home-school contacts. Results of the study compare the responses of Black and White students and parents across grade levels and may suggest avenues for intervention to improve achievement among Black students in Wisconsin.

**Alyssa Kapfhamer (103)**
Faculty Advisor/Collaborator: Barbara Lozar
*Teachers’ Understanding of and Preparedness to Implement Response to Intervention (RtI)*

Implementation of Response to Intervention (RtI) requires general education teachers to take on additional responsibilities including high quality classroom instruction, universal screening and continuous progress monitoring of students using research-based measures, data interpretation, development and implementation of research-based interventions, and collaboration. Teachers will be held accountable for making sure these components are implemented with integrity. The current study utilizes a questionnaire
to examine teachers’ understandings of their new roles under RtI, how prepared they believe they are for their new responsibilities, and what kind of assistance they might need to implement RtI.

**Kelley O’Connell (104)**  
Faculty Advisor/Collaborator: *Mary Beth Leibham*  
*School Bullying: Discrepancy Between Students’ and Staff Members’ Reports and Perceptions*

Many studies have shown that bullying has become a growing concern for teachers, parents, and students alike. Although the awareness of the pervasiveness of such aggression has increased, recent studies have shown the possibility of students’ and staff members’ perceptual differences of school bullying. The purpose of this study is to assess this discrepancy between middle school students’ and school staff’s perceptions and reports of bullying on all of the core elements, which include negative behaviors such as name-calling, hitting and excluding, power differentiation, intent to harm, and repetition of the behavior. About 800 students and 100 school staff will complete an anonymous paper-based survey regarding their perceptions and reports of bullying at their school. Descriptive statistics will be derived and the frequencies of participants’ reports will be compared.

**Sim Yin Tan (122)**  
Faculty Advisor/Collaborator: *Barbara Lozar*  
*English Language Learners’ Response to Culturally Relevant Reading Interventions*

The study examined the effects of culturally relevant (CR) texts on Hmong English Language Learners’ (ELLs) oral reading fluency. During pre-test, all nine second grade participants read both CR and non-culturally relevant (NCR) passages. Participants were then divided into three groups of three: CR intervention, NCR intervention, and control group (no intervention). Participants in the intervention groups received ten weeks of reading intervention with either CR or NCR books twice a week for an hour. All participants’ oral reading fluency progress was measured before, during, and after intervention. Pre-test results showed that participants’ reading fluency on CR passages was higher than their reading fluency on NCR passages. This difference, however, was not significant. Intervention results showed that all participants, regardless of their group, made reading fluency gains from pre-test to post-test. Culturally relevant intervention appeared to be most beneficial for one participant, whose reading fluency before pre-test placed him at medium risk. Implications for research and educational practices for ELLs are discussed.
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