UW-Eau Claire

CERCA 2013
Celebration of Excellence in Research and Creative Activity
Celebration of Excellence
in
Research and Creative Activity

(21st Student Research Day)

Abstracts of Student Presentations

University of Wisconsin-Eau Claire

May 1 and 2, 2013
Presentations in the new
W.R. Davies Center
Poster Student Presentation Times:

- Wednesday: Odd number posters 9:00 - 11:00
- Thursday: Even number posters 9:00 - 11:00
- All posters 3:00 - 4:00

Reception:

- Thursday, May 2, 4:00 - 5:00 PM
- Dakota Ballroom

Map of Davies Center with CERCA Rooms Highlighted:
## Schedule of Events

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<td><strong>Tuesday, April 30, 2013</strong></td>
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<tr>
<td>4:30-6:00 p.m.</td>
<td>Students set up posters</td>
<td>Ojibwe Ballroom, Mohican Room, 3rd Floor Corridor</td>
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<td><strong>Wednesday, May 1, 2013</strong></td>
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<td>7:00-8:00 a.m.</td>
<td>Students set up posters</td>
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<td>8:00-6:00 p.m.</td>
<td>Poster session open, with student presenters at odd numbered posters from 9:00-11:00 a.m. and even numbered posters 12:00-2:00 p.m.</td>
<td>Ojibwe Ballroom, Mohican, 3rd Floor Hall</td>
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<td>9:00-12:00 p.m.</td>
<td>Women’s Studies Research Award Presentations</td>
<td>Menominee</td>
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<tr>
<td>9:30-11:00 a.m.</td>
<td>History Graduate Student Association Symposium</td>
<td>Council Oak</td>
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<td>10:00-12:00 p.m.</td>
<td>CERCA oral presentations</td>
<td>Ho-Chunk</td>
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<td>11:00-3:00 p.m.</td>
<td>English Fest</td>
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<td>1:00-5:30 p.m.</td>
<td>Provost’s Honors Symposium</td>
<td>Ho-Chunk, Menominee, Centennial, Chancellor’s</td>
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<td><strong>Thursday, May 2, 2013</strong></td>
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<tr>
<td>8:00-6:00 p.m.</td>
<td>Poster session open, with student presenters at even numbered posters from 9:00-11:00 a.m., odd numbered posters from 12:00-2:00 p.m., and all posters from 3:00-4:00 p.m.</td>
<td>Ojibwe Ballroom, Mohican, 3rd Floor Corridor</td>
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<td>9:30-12:00 p.m.</td>
<td>CERCA oral presentations</td>
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<td>11:00-11:45 p.m.</td>
<td>Film presentation: <em>To be Hmong in America: A Counternarrative Dialogue</em></td>
<td>Woodland Theater</td>
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<td>12:00-3:00 p.m.</td>
<td>English Fest</td>
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<td>1:00-3:00 p.m.</td>
<td>CERCA oral presentations</td>
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<td>2:00-4:00 p.m.</td>
<td>English Capstone Presentations</td>
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<td>3:00-3:30 p.m.</td>
<td>Special performance: <em>A Transcription of G.B. Viotti’s Duet Concertanti for Two Bassoons</em></td>
<td>Woodland Theater</td>
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<tr>
<td>3:00-4:00 p.m.</td>
<td>Student presenters at all posters</td>
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<td>4:00 p.m.</td>
<td>CERCA Reception. A buffet of hors d’oeuvres, and speakers Chancellor Bousquet and former UW-Eau Claire student researcher and current Eau Claire City Council member Catherine Emmanuelle.</td>
<td>Dakota Ballroom</td>
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Acknowledgements

Many people helped to make this first Celebration of Excellence in Research and Creative Activity (and 21st Student Research Day) possible, and we thank them for contributing their part cheerfully and efficiently:

**Jamie Lyman-Gingerich, Lisa Quinn-Lee, Mitra Sadeghpour, Geoff Peterson and Jeff Vahlbusch, CERCA advisory committee** - for volunteering help with planning this event, both the big picture and dozens of details.

**Audrey Fessler, David Jewett, Paula Kleintjes Neff, Jessica Miller, Jean Pratt, and Simei Tong, Re-envision Research Day committee** – who volunteered time over two years developing the vision for the revised event.

**Christine Henricks, Jason Jon Anderson, Karen Stuber, Charles Farrell and Event Services crew** - for attending to a million details of preparing to hold this event in the new Davies Center for the first time.

**Steve Higley and the Custodial Services student project crew** - for carefully transporting poster panels from their storage location to the new Davies Center.

**Terri Knudtson and the catering staff** - for producing delicious victuals for the reception.

**Phil Ostrander (piano), Grant Larson (saxophone), Chris Caine (trombone) and Colin Marusek (bass)** - for performing at the Research Day reception.

**Karen Morris and members of the Forensics team** - for arranging for and moderating the oral sessions.

**Melanie Graves, student from Art and Design** - for the design of the cover of this abstract volume and all publicity materials for this event.

From **Learning and Technology Services, Beth Kranz, Gene Leisz, and BITS trainers** - for providing training in poster design and creation; **Mike Skarp** – for application software assistance; **Sarah Brower, Brandon Knuth, Danielle Ryan, Dana Miska, Michael Abbott** and **Help Desk employees** - for managing the increased load of poster printing with apparent ease; and **Rick Mickelson** - for recording the event on camera.

**Ann Statz, Erik Williams, Christie Nielsen, Heather Johnson Schmitz, Grace Kube, and Susan Santee-Buenger, ORSP office staff members** - for helping with myriad organizational details including compilation of this abstracts book.

Lastly, we thank student participants and their faculty mentors for all the hard work that led up to the polished presentations we see and hear in the new W.R. Davies Student Center.
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To be Hmong in America: A Counternarrative Dialogue

Members of the Hmong community are faced with many challenges pertaining to their immigration to the United States. The culture is constantly changing and continues to evolve as each generation encounters different experiences negotiating their identity with local culture. This project investigates the experiences of Hmong community members and highlights issues pertaining to the generational gap that exists within the Hmong community. This film also discusses the challenges and changes that different generations within the Hmong community experience. Some of these challenges include identity negotiation for younger generations concerning to their Hmong identity with the norms of American society, and the older generations seeking to have their stories and perspectives understood. This documentary also seeks to describe the fluidity of culture in general and the evolution of Hmong culture over time (i.e., the incorporation of traditions from other countries during the Hmong Diaspora). Each semi-structured interview lasted approximately one hour, during which time participants responded to a set of questions regarding their thoughts and experiences. This film was developed through collaboration with professors on campus to ensure academic integrity. This presentation will consist of a 20-minute summary preview of the documentary, followed by a discussion session regarding the content.

A Transcription of G.B. Viotti’s Duet Concertanti for Two Bassoons

The primary goal of the project was to create a critical performance edition of the Duet Concertanti for two celli by Giovanni Baptista Viotti (1755-1824) transcribed for two bassoons in order to examine how aspects of Classical musical style translate across instrumental genres. Because original works for two bassoons are compositional rarities prior to the twentieth century, transcriptions, or the adaptation of a piece of music to be played on an instrument for which it was not originally intended, serve to expand the available repertoire from earlier historical and stylistic periods for this ensemble. The transcription was created with the editorial processes of stemmatic filiation in which all available and known sources are collected to create a genealogy of the work, in which the original manuscript or earliest known source is designated as “omega”. However, rather than deeming the original manuscript the “best source,” the omega was compared to equally prioritized extant sources that it might make errors, historical idiosyncrasies, and performance practices more apparent by highlighting relationships between sources. For the project, 6 editions, including the original manuscript, were consulted. The project yielded a successful transcription appropriate for performance by two bassoons and was published and made available for purchase by Really Good Music Company, LLC. in 2012.
WHAT MUST BE DONE?: JURY TO JUDGE MADE DECISIONS IN CASES OF CIVIL WRONGS AND LIABILITY, 1850 – 1866

Few branches of legal inquiry transformed as radically during the mid-nineteenth century as cases of civil wrongs and damages—torts. As the expansion of the American railway system and industrial development created new means of destroying property, and killing and maiming people, it became clear to the courts that the old common law trespass and case writ system was unable to provide justice in the appearance and increase of “stranger cases.” This paper examines the legal transformation within cases of civil wrongs that produced new doctrines such as burden of proof, contributory negligence, assumption of risk, and proximate cause. Using State Supreme Court cases as well as secondary historical scholarship, this paper argues that judges arrived at these doctrines from their belief in Victorian Individualism and attempted to create legal institutions that promoted individual morality and accountability. However, by doing so, they also constructed a legal atmosphere that fostered the expansion of the American economy by providing the tools to restrict legal action against corporations by placing the injured parties, usually members of the common citizenry or laborers, at a legal disadvantage.

COUNTERINSURGENCY: THE ROLE OF LEADERSHIP IN AMERICAN COUNTERINSURGENCY POLICY AND TACTICS

The U.S. military and government exhibit a trend of neglecting the development and employment of non-conventional counterinsurgency tactics. This apathy toward counterinsurgency makes it difficult for counterinsurgency tactics to be accepted and, when appropriate, enacted. Several of these trends emerge when one compares the events of the Vietnam War to the actions the U.S. military undertook in Iraq and Afghanistan in the 21st century. Research will focus on U.S. military reports of the actions in Iraq and Afghanistan, along with firsthand accounts from the soldiers and officers involved. Works in counterinsurgency theory will also be a main focus. Research on the leadership will focus on recordings, autobiographies, and treatment in secondary sources. Research to this point shows that the civilian and military leadership, ignorant of local factors, exert a deleterious effect on the choice of strategies and tactics in conflicts that are not conventional in nature. This project will also show the increasing reliance that the U.S. military and government are placing on technology that does not fit with the nature of conflicts in which the U.S. is becoming involved.

WITNESSING A COMMUNITY IN TRANSITION: THE EXPERIENCES OF THREE RURAL GERMAN-AMERICAN WOMEN IN MANAWA, WI BETWEEN 1920 AND 1970

The German-American generation born between the World Wars witnessed dramatic changes in rural lifestyle and ethnic identity during their lifetimes. In the spring and summer of 2012 I conducted several oral history interviews of community members in Manawa, Wisconsin addressing how their community had changed in their lifetime. I learned that rural and German-American identity in this rural Wisconsin community was not static, but constantly changing. Three women I interviewed who were born in the 1920s witnessed great changes in the German-American community and in the rural community as a whole. These women grew up during a time when German was still spoken in their community and church. They attended country school houses. They farmed with draft horses instead of tractors. As adults they were all working mothers in the 1960s. This excerpt from my thesis chronicles the lives of these three women focusing on their education and work lives from when they were children in the 1920s and 1930s through their adult years balancing family and work until 1970.
Robert A. Bell  
Faculty Mentor/ Collaborator: James Oberly  
Big Business and Native American Sovereignty and Education

The Santa Fe Indian School has always been known for the art work that has been produced there. There has been much written about the school and the many different types of art styles that have been started there. What has never been researched is the fact that the Santa Fe Indian School had a curriculum based around art. Unlike the Carlisle Indian Boarding School, that gave its students an industrial education. Why was this? Looking at the Santa Fe Indian School closely, there were many Indian art collectors and some big businesses involved in the school and among the Pueblo concerning their art. Some non-Indians were making a large amount of money from the sale of the art, and among them was the director of the school John DeHuff and his wife Elizabeth. The story of the Santa Fe Indian School and its relationship between art collectors and American big business during the Progressive Era is well hidden in history. This project will try to uncover this mystery and explain the connection between American business, Pueblo art, and how the school was able to teach an art curriculum instead of an industrial curriculum.

WOMEN’S STUDIES RESEARCH AWARDS AND CAPSTONE PROJECTS

Wednesday, May 1  
Menominee Room  
9:00-10:00

Adelyn Strei (Crothers Award recipient)  
Nominator: Theresa D. Kemp  
The Wire: An Original Song and Video

This presentation will showcase a song and video that engages both critically and artistically with a key moment in the brutally violent narrative of Lynda Barry’s deceptively simple illustrated novel, Cruddy. The song depicts the strong emotional attachment between the novel’s main character and her abusive father, a murderous alcoholic and unemployed meat-cutter. The song also captures the Stockholm-syndrome-like nature of the child’s love for the father. It also connects to what makes the novel’s main character so compelling: her refusal to cut the wire of love and hope even though it makes her dangerously vulnerable.

Dessa Bell (See Award recipient)  
Nominator: Karen Loeb  
My Mother’s Mother and the Unnamed Ones: Ancestral Feminism through Poetry

One of the greatest achievements of Women’s Studies is giving a voice to women who would have otherwise remained forgotten to history. As a student of Women’s Studies and English, I was motivated to create textual evidence of the strength and integrity of my female ancestors and how they have shaped my life as a modern feminist. I began by listening to the stories and traditions that have been passed through the women of my family. After I had heard numerous oral stories from relatives, I decided that poetry would be the most poignant medium to record them. The poems in this project examine issues that still affect many young women today, such as the stigma surrounding loss of virginity and the need for inner strength. The project was also highly personal, I examined my own upbringing, my relationship with my father, and the deep connection that I have to my female ancestors. At the project’s end I gained awareness of the impact that my grandmothers have made on my life. I hope the meaning that others will take away from this project is that there are no unimportant women, just women whose stories have yet to be told.
**Wednesday, May 1**

**Menominee Room**

**10:00-11:00**

**Kelly Bertzyk** (Helen Sampson Award recipient)
Nominator: **Barbara Kernan**

*The Evolution of the Doll and its Impact on American Girlhood*

Based on the history of American dolls, there has been a critical shift in how we teach girls to be women. While the earliest dolls were ceremonial and sacrificial and carried cultural messages of empowerment and belonging, dolls today simply fetishize what it means to look like a sex object with a desire to be a consumer. Even dolls of the 1940’s and 1950’s that promoted the role of mother taught girls to have skills and to DO something. Many dolls of this time also encouraged girls to learn about other cultures and literature. While it might be argued that Barbie also has a sub-line of international costume dolls, she cannot escape her origins as a fetish. Barbie and her off-shoots encourage girls to have a “look” rather than a life. This paper examines American dolls from various times and makers, places them in their historical context, and notes a shift to the fashion doll in its current context of negative body image, eating disorders, and consumer culture.

**Ong Xiong** (Helen Sampson Award, Undergraduate Project Award, and Tillie Olsen Award recipient)
Nominator: **Theresa D. Kemp**

*Hmongwrite*

“Hmongwrite” is a creative response, rejection, and supplement to “Hmongspeak,” by May Lee Yang, which is featured in *Bamboo Among the Oaks*. “Hmongspeak” and “Hmongwrite” both illustrate a woman’s engagement in an indirect form of speech that is culturally-specific to the Hmong, which May Lee Yang terms Hmongspeak. However, the speaker in “Hmongwrite” experiences Hmongspeak quite differently from the speaker in “Hmongspeak.” “Hmongwrite” considers the ways in which understanding how to properly speak and hear Hmongspeak influences how a person experiences Hmongspeak. This includes speaking with the goal of building peace and relationships, predicting and gauging needs and desires in the context of shared experiences or cultural expectations, and establishing mutual understanding by not building emotional barriers. Together, “Hmongspeak” and “Hmongwrite” show that forms of communication are often governed by standards of use and interpretation. However, peoples’ knowledge of these standards, their ability to abide by them, and their ability to escape them are contingent on the politics of their location and their intersectionality. Consequently, these standards can (i) determine access to participation in society however, (ii) disrupt communication, (iii) accommodate or exclude identity and life experiences, and (iv) propel the creation of new forms of communication.

**Christopher Jorgenson** (Helen Sampson Award and Graduate Project Award recipient)
Nominator: **Audrey Fessler**

*Like a Girl: A Gay Man’s Theoretical Exploration of Identity*

Part autobiography, part theoretical exploration and critique, this work challenges the cliché of a division between “academic” theory and “activist” lived experience. It is intended for use in undergraduate literary theory and gender/sexuality theory classes as a tool for helping upper-division students see how literary theory might be used to make sense of their own embodied experiences, and how sustained reflection on their own experiences might prepare them to develop productive challenges to and refinements of particular theories.

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**Wednesday, May 1**

**Menominee Room**

**11:00-12:00**

**Jamie Erickson** (Turell Award recipient)
Nominator: **Jan C. Stirm**

*Using the Disreputable History of Frankie Landau-Banks to Introduce the Feminist Lens*

In the thesis, Ms. Erickson talks about the difficulties of teaching high school students to read well, and to read different texts, and argues convincingly that teaching students to use a feminist lens helps them read and interpret texts. The thesis begins by explaining the situation at her high school, the anti-feminism, the use of traditional male-authored texts, and the difficulties of engaging all students. She then outlines and explains why she’s chosen to teach E. Lockhart’s young adult
fiction, The Disreputable History of Frankie Landau-Banks to engage students and introduce them to reading works by women and to a feminist approach, not only to a text, but more broadly to what they see around them. Ms. Erickson then details assignments and talks about the difficulties and rewards of teaching the text. Thus, Ms. Erickson’s thesis intervenes by introducing feminist theory at the most basic level where it is vitally important. She supports her argument with work from feminist theory, pedagogical study, and finally a strong understanding of how to teach this novel in a high school classroom.

**Gretchen Bachmeier** (Barcelo Award recipient)
Nominator: **Barbara Kernan**
*A Women’s Studies Undergraduate Experience: Combining Feminist Theory and Praxis*

The presentation gives insight into the numerous opportunities available to Women’s Studies students, which assist to broaden and enrich one’s experience as a student at the University of Wisconsin-Eau Claire. The core focus will be discussing my experience as an intern for the Women’s and LGBTQ Resource Center. This work is a great opportunity to give specific examples of how Women’s Studies undergraduates can combine feminist theory with praxis. When many may question the importance of a Women’s Studies degree it is crucial to share the value and opportunities this degree allows. These values and opportunities go far beyond an individual’s career for they work to aid our student body and our campus community.

**Wednesday, May 1**
**Alumni Room**
**2:00-4:00**

**Gretchen Bachmeier, Amanda Geist, Brittany Wiest, and Devon Lehr**
Faculty Mentor/ Collaborator: **Theresa D. Kemp**
*Collaborating with Local Women who are at Risk for Hepatitis C: A Forward Step to Meeting a Need in the Chippewa Valley* (Capstone)

The Aids Resource Center of Wisconsin (ARCW), our community partner, began testing for Hepatitis C Virus (HCV) in October 2012. The center has yet to form an outreach program surrounding this health concern. Our project aims to educate women injection drug users (IDU) at risk for contracting HCV in the Chippewa Valley. Among the learning goals for students in Women’s Studies is to enact “social responsibility to effect change that promotes social justice.” Driven by feminist theories throughout our careers in Women’s Studies, this activism-based project helps ARCW develop much-needed programming for women IDU at risk for HCV. We will conduct multiple informational sessions at a treatment center in Eau Claire to discuss strategies for reducing risk factors such as HIV and HCV by negotiating safer sex with partners and developing healthier relationships. This differs from conventional abstinence-only programming because our outreach employs a harm-reduction model. We work with clients using feminist modes of communication aimed at constructing equitable and collaborative solutions. This presentation evaluates the effectiveness of our program in accordance to pre- and post-surveys from the clients of each session. We predict our program will meet the informational needs of the clients and be replicable in the future.

**Katie Lynn Johnson**
Faculty Mentor/ Collaborator: **Jennifer J. Muehlenkamp**
*Feminist Identity in Relation to Non-Suicidal Self Injury and Disordered Eating* (Capstone)

For details, see corresponding CERCA poster presentation number 23 on page 88.

**Katrina Rose Leonard**
Faculty Mentor/ Collaborator: **Kathleen A. Nybroten**
*A Feminist Content Analysis of Bridal Magazines* (Capstone)

For details, see corresponding CERCA poster presentation number 81 on page 98.
Lindsey Leanne Peterson, Cassandra Anne Lane, Elizabeth Anne Nowobielski, and Jennifer Randi Zirk
Faculty Mentor/Collaborator: Theresa D. Kemp
*Increasing Support for Planned Parenthood of Wisconsin: Campus, Community and Civic Engagement* (Capstone)

Due to the recent closures of four Planned Parenthood health centers throughout Wisconsin, our Women’s Studies Capstone project is aimed at increasing awareness and supporters regarding the vitality of services Planned Parenthood provides. Planned Parenthood WI gives thousands of women and families the means to control their own reproductive health, from sex education to contraception. They are the leading voice for women’s reproductive health and rights. The purpose of our project is to work with Planned Parenthood and the UWEC student organization Advocates for Choice in order to increase the supporter base of women’s health advocates and provide young people with the resources they need to take control of their sexual and reproductive health. In compliance with the Women’s Studies Program’s fourth goal, “individual and social responsibility to effect change that promotes social justice,” our project also aims to advocate for legislative support. Our efforts will culminate in an open house at the Planned Parenthood center in Eau Claire. We will be inviting supporters, donors, local community partners and health officials from the Chippewa Valley. Our project uses an integrated model that combines feminist methodology, activism, and developed communication skills.

**ENGLISH FEST**

**Wednesday, May 1**
**Council Oak Room**
**11:00–12:00**

**Braden Joseph Krien (English Creative Writing)**
Faculty Mentor/Collaborator: **Jefford B. Vahlbusch**
*The Role of Virgil in Dante’s Divine Comedy*

Dante Alighieri’s poem, *The Divine Comedy*, holds an indisputable place in the highest echelons of world literature. One of the central characters in the first two parts of this travelogue is Virgil, Dante’s guide and poetic predecessor. Much has been said about Virgil. This research project critically examines the role of Virgil through a semester-long survey of scholarship on *The Divine Comedy* in English. Through an examination of Virgil in classic and more recent scholarship, and in *The Divine Comedy* itself, this project will illuminate the role of Virgil as guide, teacher, theologian, protector, as well as one of the creators of the poetic tradition that Dante-poet inherits.

**Kimberly Schnurr (English Literature)**
Faculty Mentor/Collaborator: **Audrey Fessler**
*Researching the Forgotten: The Revival of “New Women” Writers to 21st Century Scholars*

When one thinks of canonical Victorian literature a few names instantly come to mind: Charles Dickens, George Eliot, and Charlotte Bronte. Although these writers were talented indeed, their fame can overshadow other writers of the time period. Sarah Grand and George Egerton are two such authoresses that I argue are just as worthy of literary legacy as all of the aforementioned. By reviving these forgotten women writers, into Victorian literary canon, we come to understand so much more about the Victorian period and of women’s movements happening during that time. Their unorthodox subject matter, including sexually transmitted infections in Grand’s “The Heavenly Twins” and the celebration of female sexuality in Egerton’s “A Cross Line,” as well as the natures of their gender as women writers contributed to them being snuffed out of Victorian anthologies. It is my contention that these women were too courageous, too postmodern, and too brilliant to be left to the dreary, dusty bookshelves of literary history. We not only deny ourselves as scholars the knowledge that these women and their works can teach us, but we rob future generations of those lessons, as well. If we don’t recover women writers like Grand and Egerton, who will?

**Ryan Vingum (English Literature)**
*Conceiving the Western Novel: Anti-Essentialism and Gender in Willa Cather’s O Pioneers!*

Through a critical feminist viewpoint, I examine Willa Cather’s novel *O Pioneers!* in order to explore the role of women in the Western genre. In Western literature, there exists a model with men at the forefront as heroes, and women in the background, quiet and passive. By evaluating the role of women in *O Pioneers!*, the preconceptions of gender are revealed to be not quite as clear and rigid in this male dominated genre. I have discovered that women are capable of fulfilling the
role typically shouldered by men in Western literature.

**Wednesday, May 1**  
**Council Oak Room**  
**12:00-1:00**  
Moderators: **Erin Stevens** and **Jonathan Walker**

**KC Coughlin** (English Creative Writing), **Quinn Forss** (English Creative Writing and Women’s Studies), and **Laura Becherer** (English Graduate Program)

**Roundtable Discussion: Developing a Non-Sexist/Non-Gendered Language Policy at UW-Eau Claire**

Creating inclusive language for underrepresented bodies – specifically, the feminine and other “unmarked” gender categories – creates a reality that acknowledges the existence of said bodies (e.g., Wattman & Treichler, Pauwels). Through a multidisciplinary effort (Women’s Studies, English Linguistics, and Psychology), faculty-student collaboration, administrative partnership with Affirmative Action, and support from our Commission on the Status of Women at UW-Eau Claire, we are developing a language policy that eliminates language that renders unmarked genders invisible or subordinate. In considering the need for such a policy, we examined uses of gendered and sexist language in university documents and investigated language attitudes and experiences with sexist/gendered language (collected via surveys and interviews). We contend that awareness of inclusive language does more than affect the social dialect; it strives toward a reality where language usage more accurately represents its referents.

**Wednesday, May 1**  
**Council Oak Room**  
**1:00-2:00**  
**Jonathan Walker** and **Sarah Weinmann**  
Faculty Mentor/Collaborator: **B.J. Hollars**

**Panel Presentation: How Far Can Fiction Go?**

All of these pieces of fiction, gathered and shown side by side, illustrate the vast amount of variation that fiction writers have to work with and the infinite array of topics available to their creative minds.

**Erin Stevens** (English Creative Writing)  
**Chronicles of a Part-time Waitress**

Erin will read an excerpt from the first half of her story “Chronicles of a Part-Time Waitress” which documents the mundane and unfortunate experiences of Cara, a part-time waitress at a poorly run restaurant.

**Josh Bauer** (English Creative Writing)  
**Bets**

Josh will read from his story “Bets” which explores the relationship of two college students through the seemingly innocuous activity of making five-dollar bets during a freak August snow shower.

**Rebekah Morrisson** (English Creative Writing)  
**Creases**

“Creases” briefly explores the comfortable marriage of Gertrude and Dan, which takes a complicated turn for the worst; in connection to a deceased feline and an enveloped message, the reader gradually uncovers the story behind the two characters’ strained facial expressions.

**Jesalee Simonson** (English Creative Writing)  
**The Backyard Burial**

Jessalee will read her story “The Backyard Burial” about a couple experiencing marital discord while burying their beloved pet.
Wednesday, May 1
Council Oak Room
2:00-3:00
Moderators: Rebekah Morrisson and Jonathan Walker

Kaitlyn Johnson (English Literature)
Faculty Mentor/Collaborator: Carey Applegate
No Unity: An Ethical Analysis of The Boondock Saints

This presentation is an analysis of the film The Boondock Saints based on the theories explained in Alan Badiou’s Ethics: An Understanding of Evil. This analysis uses a critical approach to explore the relationship between religion and ethics, as well as how the film exemplifies Badiou’s ideas of an event, a subject, and that subject’s fidelity to the event.

Greta Schulz (English Education)
Faculty Mentor/Collaborators: Carey Applegate
Climbing the Socioeconomic Ladder in Disguise: A Look at the Masking of Socioeconomic Status in Arthur Conan Doyle’s The Adventures of Sherlock Holmes

This presentation uses a critical approach to analyze the disguises used by characters in the Sherlock Holmes short stories and the role that socioeconomic status plays.

Thursday, May 2
Council Oak Room
12:00-1:00
Moderators: Erica Benson and Jonathan Walker

Jonathan Walker
Faculty Mentor/Collaborator: Alan Benson
Panel Presentation: The Work We Do Outside the Center for Writing Excellence: The Challenges and Opportunities of Community Outreach

This round-robin conversation will consider the often-overlooked work of outreach via building campus writing communities, reimagining methods of interacting online, and creating strategies for bringing faculty into the Center for Writing Excellence as writers/learners.

Lindsey Fenner (English Graduate Program)
Community Outreach Activities

This presentation explores how community-building outreach activities can help change a writing-retticent campus into a community of writers, but only when the outreach is strategic and focused. Using activities from community organizing, participants will reflect on past practices of writing center outreach and generate a transformative vision of a community of writers.

Nicholas Freitag (History Graduate Program)
Outreach via Social Media

This presentation narrows the focus to one specific means through which outreach takes place: social media. Many centers have responded to the potential of social media without thinking through how they present themselves and how “improper use” of the space can work against outreach efforts.

Daniel Henke (English Graduate Program)
Strategies for Reaching Out and Engaging with Faculty Writers

In this presentation, we invite participants to contribute to a conversation about how encouraging faculty to use the center themselves can both promote better relationships with individual instructors and foster the development of a writing-centric campus culture. What strategies exist for reaching out and engaging with faculty writers?
**Thursday, May 2**  
**Council Oak Room**  
**1:00-2:00**  
**Moderators:** Rebekah Morrisson and Erin Stevens

Jonathan Walker (English Literature)  
*“Shattered Crowns”: A Passage of Memory*

This reading is an excerpt from a longer creative work currently under development. James is an intuitive young blacksmith-in-training, living alone with his mother. While digging through the attic he comes across a tattered journal. Through reading it, James learns about a missing part of his life. This memory-in-a-memory alters the way James views his world.

Crystal Kloth (English Creative Writing)  
Faculty Mentor/Collaborators: Carey Applegate and B.J. Hollars  
*The Willow Tree*

Crystal will be reading from “The Willow Tree”, a story about Annalise, a fifteen year old girl, whose father has been abusing her for years. Will Annalise let Damien, a kind stranger whom she met in the woods, help her escape or will she be stuck hiding under her willow tree? This story combines the themes of abuse, courage, and guilt to take the reader on a journey through an unlikely relationship beginning and ending along a memorable crick.

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**Thursday, May 2**  
**Council Oak Room**  
**2:00-3:00**  
**Moderators:** Rebekah Morrisson and Erin Stevens

**Panel Presentation: Creating the Human Experience**  
Faculty Mentor/Collaborators: Carey Applegate and Gloria Hochstein

These creative works share a common theme of understanding relationships and the human condition.

Caitlin Bittner (English Creative Writing)  
*Riding a Bike*

Caitlin reads an excerpt from her story “Riding a Bike”, in which a father is getting ready to give his daughter away on her wedding day while having flashes of the past that deal with his recovery from alcoholism.

Briana Galbraith (English Creative Writing)  
*Liquid Blue*

Briana reads a story that examines the friendship of two former high school students and how it has changed over time.

Allison Puestow (English Literature)  
*Night to Day*

Allison reads from a collection of poetry that follows time from midnight until dawn, talking about the changes that bring darkness to light.

Michael Sean Seitz (English Creative Writing)  
*Bad Habits*

In “Bad Habits,” a teen growing up without a father and a strained relationship with his mother finds himself getting caught up in smoking, which leads him to meet an old trucker with worldly information.
CERCA ORAL PRESENTATIONS

Wednesday, May 1
Ho-Chunk Room
10:00-11:00
Moderators: Abby Rand and Megan McKeown

Daniel Scott Putman and Mitchell Eric Fischer
Faculty Mentor/Collaborator: Petrik Runst
Economics
Understanding Competing Measures of Risk Preferences: Survey Evidence from Students at University of Wisconsin-Eau Claire

Recent work in economics and psychology has identified that how humans conceptualize risk plays a central role in economic, social and political decision making. Different disciplines seek to explain risky decisions using distinct ideas about what drives perceptions of risk. The cardinal risk preference perspective supposes that individuals have fundamental risk preferences which explain their behavior in cases of uncertainty. Conversely, the cultural cognition hypothesis supposes that individuals view risky behavior through the lens of their cultural worldview and thus subject to biases in evaluating risk. We use survey data from undergraduates at UW-Eau Claire to examine and compare these alternate explanations of risk perception. We measure worldviews, cardinal risk preferences and perceived risks of a set of personal, political and social decisions. We then compare the power of cardinal risk preferences and worldviews in explaining variation in measured risk perceptions. Our study hopes to deepen our understanding of how proximity to our risk relates to the perception of that risk.

Mitchell Eric Fischer
Faculty Mentor/Collaborator: Petrik Runst
Economics
The Crisis & Belief - The Political Economy of Care and Fear

The United States has experienced permanent increases in public spending since 1953. While numerous Public Choice scholars have attempted to explain consistent increases in spending with lobbying practices, there is limited research on how individuals’ changing preferences for government intervention may affect public spending. Data from The World Values Survey (WVS), Swiss Household Panel (SHP), General Social Survey (GSS), and the German General Social Survey (ALLBUS) suggest that individuals’ preferences change in the midst of national crisis situations, such as economic recessions. In this study we conducted an experiment on 197 undergraduate students. The experiment surveyed participants’ opinions on both national policy issues and an unbiased film explaining the most recent recession of 2008. We find that exposure to crisis situations created a significant effect in how individuals perceived the market economy and various policy issues.

Wednesday, May 1
Ho-Chunk Room
11:00-12:00
Moderators: Alex Brown and Sarah Doege

Eric Michael Andersen
Faculty Mentor/Collaborator: Jennifer L. Johs-Artisensi
Management and Marketing
Prospective Employer Characteristic Preferences

Many students have a very hard time choosing what they would like to major in, nonetheless what to minor in. It can be challenging for students to determine what activities to participate in that they would enjoy, find most rewarding, and most useful for their future career. When considering a minor, certificate, or other experiences, students often want to know what will look best on their resume in order to help them weigh how they could best spend their time in college preparing for their future career. We surveyed a wide variety of health care professionals and leaders in the field of health care who often hire students from health care or aging services administration majors. Results of our survey have yielded the fol-
Experience in the health care field is almost always prioritized over a second educational credential.

The most marketable double majors, minors, and certificates include: gerontology, business administration, management, finance, and accounting.

The practical importance of gaining a Certified Nursing Assistant license.

Valued ancillary experiences, beyond classes, include health care and leadership experience.

Our results identify what characteristics, credentials, and experiences are desired by prospective employers and can be used by advisors to help students in health care-related fields make more informed decisions.

Hannah Leigh Imhoff and Jake Keefer
Faculty Mentor/Collaborator: Charlotte K. Sortedahl
Nursing
Perspectives from the Field: Bringing Nursing Leaders into the Classroom

Leadership is crucial in nursing. Little is known regarding specific professional behaviors nursing leaders believe nursing students should develop and whether nursing students view these behaviors as important. The purpose of this project was to evaluate: 1) undergraduate nursing students’ perceptions regarding leadership behaviors after watching a video highlighting nursing leaders, and 2) feasibility. This project used a pre-test, post-test design with an intervention group and control group of 56 students each. Four hospital nursing leaders in the Midwest were videotaped during separate 30-minute, semi-structured interviews. A nine-minute video was created and shown to the intervention group in a required senior-level nursing course. The 39-item test instrument was administered to the control group in one semester and the intervention group in another. The intervention group also completed a survey regarding the video. Preliminary results indicate that watching multiple nurses discuss similar leadership concepts is effective in influencing students’ views on how they can be leaders as novice nurses and that video is a practical strategy to bring professionals into the classroom. Average means will be compared and we expect that this is one way to link leadership skills with professional practice in a meaningful way for students.

Thursday, May 2
Menominee Room
9:30-11:00

Moderators: Jarrel Montgomery and Caitlyn Duley

Jason Jerome Hansen
Faculty Mentor/Collaborator: Matthew W. Waters
Foreign Languages
Xenia in Practice: From Homer to Herodotus

The Greek custom xenia (“guest-friendship” or “hospitality”) is prevalent in the Homeric epics (i.e. the Iliad and the Odyssey), from which historians gain the greatest understanding of the custom. Yet is it accurate to project this understanding of xenia from the circa seventh century BCE epic poems to occurrences of the practice centuries later? After defining the custom according to the Odyssey, to a lesser degree the Iliad, and secondary literature such as Gilbert (1969), Donlan (1982 & 1989), Reece (1992), and Newton (2008), I have examined several instances of xenia in The Histories by Herodotus, one of the most preeminent historians of the fifth century BCE. By carefully examining these case studies – including Amasis and Polykrates (Hdt. 3.40-43) and Hippias and the Spartans (Hdt. 5.63, 90-91) – xenia can be redefined by comparing its idealized form in the early poems to evidence for its actual practice later in histories and other later works.

Quan Hung Nguyen
Faculty Mentor/Collaborator: Max Garland
English
Vietnam: A Cross-Cultural Study, Post War Poetry and Poetics

In this research, I present a multitude of discourses as depicted in the poetry of Vietnamese and Vietnamese American
writers in the post-1975 era. The Vietnam War has always been more than a war; it is a never-ending tale of how people cope during and after a series of events that culminate in the Vietnam diaspora. Through the analysis of various poems selected in the anthology *From Both Sides Now: The Poetry of the Vietnam War and Its Aftermath* edited by Philip Mahony, in addition to other collections, I offer my hermeneutic examinations of poetry as a means to elucidate the intricate conundrums of the narrative identities of exile among Vietnamese writers.

**Yeng Matthew Chang**  
Faculty Mentor/Collaborator: **Gary W. Don**  
Music And Theatre Arts  
*Late 19th-Century Harmonic Practice as a Bridge to the 20th Century*

Music in the late 19th century is the bridge between the Romantic and 20th Century periods, where the Romantic emphasizes the idea of musical keys of the classicists and the 20th Century emphasizes the idea of musical atonality or lack of musical key. While there exists an abundance of research in the theoretical conventions of the Romantic and 20th centuries, not much research has been done pertaining to the transitional period between these two periods, due to the fact that there has not existed a systematic approach to analyzing the music of this time period, until very recently. We have examined passages in the music of Prokofiev and of Vaughan Williams, using Russian modal theory and Dr. Ian Bates’ newly developed *Table of Diatonic Relations*. Through the reduction of music to different musical scales, we have found that the music examined uses “mixtures” of eight-note musical scales whose relationships can be described using mathematical operations in the aforementioned *Table*.

**Ross Michael Christianson**  
Faculty Mentor/Collaborator: **Gretchen Peters**  
Music and Theatre Arts  
*Solidarity Forever*

My key objective is to highlight the importance of borrowing in the history of protest music, using the repertoire and intentions of the Solidarity Singers in Madison, WI as the frame. Having recently passed their two-year anniversary, the solidarity singers have been diligently singing every weekday at noon in and outside of the Wisconsin State Capitol. This is a significant phenomenon, since it has been nearly 50 years since collective singing has been widely used as a method of protest. This presentation is based upon interviews with members of the Solidarity Singers, on-site observations of protest, and online research through news articles and YouTube videos. This information is then contextualized using scholarly research on U.S. social protest and protest music. The borrowing and adaptation of music and text from songs of past social movements is a prominent part of the repertoire of the Solidarity Singers and has strong implications for the purpose and meaning of the music. A handful of songs, which have been identified as significant by members of the Solidarity Singers, will be used as examples.

**Thursday, May 2**  
**Ho-Chunk Room**  
**9:30-11:00**  
**Moderators:** **Jake Stendahl** and **Alex Brown**

**Andrew David Dettle, Carl Eithun, Anna Hanson, Arrly Her, Erik Hulman, Julia Kasprzak, Justina Kinard, Trent Tetzlaff, Nicole Neal, Zachary Nemeth, Hanna Tousignant, Amanda Nachtwey, Jessica Valdespino, and Samantha Weinkauf**  
Faculty Mentor/Collaborator: **Leah Olson-McBride** and **Holly T. Hassemer**  
Social Work and Academic Skills Center  
*Transition Experiences from High School to UW-Eau Claire*

According to the National Center for Education Statistics (NCES) (2013), only 56% of students at 4-year public institutions complete college within 6 years. The inability to complete college is not only a personal disappointment, but also has a significant financial impact. Recent studies have shown that young adults with a bachelor’s degree earn $15,000 more per year than individuals with only a high school diploma (NCES, 2013). A research team consisting of first-year students from the University of Wisconsin-Eau Claire (UWEC) Collegiate Bridge program explored the high school to college transition experiences of first-year students at UWEC. The sample consisted of approximately 40 respondents, all of whom were first-year students at UWEC. Respondents were administered a 27-question survey focused on academic,
social, familial, and financial factors that may have impacted their high school to college transition experience. The data will be analyzed to determine commonalities among respondents in terms of factors that may have impacted their transition from high school to college. It is hoped that the findings will expand our understanding of college transition experiences, as well as provide valuable information regarding how universities such as UWEC can support and promote the academic and social well-being of first-year students.

Mariah Quick and Teresa Elizabeth Dallman
Faculty Mentor/Collaborator: David Jones
English
Expanding Students’ Role in Honors Programs through Development of Leadership Opportunities within Courses

Continual growth is essential to keep honors courses innovative. Teresa Dallman and Mariah Quick challenged the conventional role of student mentors by reconstructing a popular honors course: Issues in Global Health. Alongside their professor, Dr. Cheryl Lapp, mentors reduced the syllabus to its core elements and rebuilt a fluid model that allowed student-lead discussions to direct classroom experience. Traditionally, mentors assist professors by performing assigned tasks. Dr. Lapp widened the responsibilities to include teaching and course design. Student-faculty collaboration changed course content to include modern health concerns and overall reduction of redundant material. Guest lecturers from different departments contributed to the expanded notion of global health. Mentors played an integral role in development of high impact learning practices including a cultural immersion project. The project paired honors students with international students providing an environment for unique discussions about global health. Additionally, each mentor designed and taught a lesson giving them deeper understanding of how the model challenged both students and professors. These practices all contributed to a re-energized course. This presentation will discuss methods used to create the new model and the significant role that students can play in the development of honors programs when given the opportunity to lead.

Emily Kathryn Gresbrink
Faculty Mentor/Collaborator: Jan Larson
Communication and Journalism
The Impact of Domestic Immersion Reporting Experiences on Journalism Students

The University of Wisconsin-Eau Claire’s Civil Rights Pilgrimage (CRP) takes students through the southern United States and travels to areas important to the 21st Century’s Civil Rights Movement. In January 2012, the Communication and Journalism department paired with CRP coordinators, creating a domestic immersion opportunity for undergraduate journalism students. A special topics course invited a small group of journalism students to travel on the pilgrimage to report on racial, social justice and civil rights issues. For the past three pilgrimages, nearly 30 students produced and published journalistic work. This pilot research study analyzes responses from pilgrimage participants, and aims to explore recurring themes of experiences and effects of the pilgrimage, both personal and professional. The research also aims to be the basis for analysis of future CRP participants, both for academic reference and hard evidence of the significance as well as the validity of domestic immersion experiences. Through analysis of pilgrimage participants’ personal essays and quantitative data from previously conducted CRP research, the research seeks to answer the following question: do undergraduate journalism student’s domestic immersion reporting experiences have a positive, negative, or otherwise significant impact on their education, careers, and personal lives, and how so?

Jacqueline Ann Lee and Virgil Ward II
Faculty Mentor/Collaborator: Jodi Thesing-Ritter
Dean of Students
Assessment of Impact of Civil Rights Pilgrimage on Student Participants

The development of multicultural competence is becoming a priority at American colleges and universities as they strive to prepare students for an increasingly diverse world. Experiences beyond academic courses are a viable alternative. Students at UW-Eau Claire have participated in a 10-day Civil Rights Pilgrimage (CRP) that provides a case study for immersion experiences as an alternative means of education. Student surveys using multiple metrics show a significant decrease in racism as measured by the Modern Racism Scale and a significant increase in awareness and understanding of White privilege, measured by the White Privilege Attitudes Scale. Participation in the CRP heightened students’ awareness of their own assumptions, biases, and values, increased their understandings of others’ worldviews, increased their understanding of African-American culture, and promoted awareness of current social justice issues. This study supports the use of quality immersion experiences in American colleges and universities as an educational method for improving multicultural competence development for college students.
Observing Fruit and Vegetable Consumption of Children for Snack and Dinner in an Afterschool Program: Exploring the Influence of Healthy Messages, Incentives and Praise

Given US children’s low fruit and vegetable intake, understanding the successes of interventions to increase children’s fruit and vegetable consumption is important. Previous research reveals elementary school students participating in the USDA Fresh Fruit & Vegetable Program typically eat fruit and vegetables served for free at school snack, and using incentives and praise can increase consumption even more. However, more research is needed to further investigate the role of incentives and praise in increasing children’s fruit and vegetable intake. In this study we observe the fruit and vegetable consumption of children (ages 7 – 15) attending an afterschool program. We first establish a baseline fruit and vegetable intake and then experiment using a variety of incentives including healthy messages/fun facts, raffle prizes and praise designed to increase intake above baseline levels. We are collecting fruit and vegetable intake data four days a week from September 17, 2012 – April 12, 2013. No results are given here because data collection is ongoing and the incentive phases of the study have just begun. A preliminary analysis suggests children do generally eat some fruit and vegetables, but there is significant room for increased consumption in response to incentives and praise.

Comparing Children’s Self-Reported Fruit and Vegetable Behavioral Intent to Observed Fruit and Vegetable Consumption for Snack and Dinner in an Afterschool Program

Given US children’s low fruit and vegetable intake, understanding the successes of interventions to increase children’s fruit and vegetable consumption is important. Previous research reveals elementary school students participating in the USDA Fresh Fruit & Vegetable Program report increased willingness to try new fruit and vegetables, but these positive changes in behavioral intent are self-reported with no corroboration. Thus, more research is needed to investigate the accuracy of self-reported positive impacts of such interventions. In this study we observe the fruit and vegetable consumption of children (ages 7 – 15) attending an afterschool program. In addition, we survey these children’s willingness to eat familiar and unfamiliar fruit and vegetables and ask them to identify fruit and vegetable items they like, don’t like, and have not tried. Our data analysis examines the degree to which children’s observed consumption behavior matches their self-reported behavioral intent. We have completed questionnaires for about 100 students and we are collecting fruit and vegetable intake data four days a week from September 17, 2012 – April 12, 2013. No results are given here because data collection is ongoing. A preliminary analysis suggests there is some deviation between children’s observed behavior and their self-reported behavioral intent.

Results from a Survey of Middle and High School Students Regarding Climate Change Awareness and Understanding

Climate change, a phenomenon entailing warming average global temperatures, is an important and divisive policy issue. Despite the existing scientific literature on climate change, many people in the US misunderstand the scientific realities of climate change. Moreover, the climate change public opinion literature highlights a division across political ideologies with conservatives being more likely than liberals to be skeptical of the existence of anthropogenic climate change. This political divide has also surfaced in the debate over climate change education as scientists and educators report resistance to the teaching of climate change in schools. We conduct surveys of middle and high school students in Wisconsin
to broaden our understanding of climate change public opinion. We find middle school students are much less informed and concerned about climate change compared to high school students. Ninth grade students report the highest level of awareness and concern. Students in all grades say they learn more about climate change in school than from other sources with older students saying they learn the most in school. Our results provide valuable evidence to inform and facilitate the discussion over climate change education in US schools.

**Thursday, May 2**

**Ho-Chunk Room**

**11:00-12:00**

**Moderators: TBA**

**Kara Marie Braunreiter**  
Faculty Mentor/Collaborator: Jamie Lyman Gingerich  
Biology  
*Understanding Human Genetic Diseases: C. elegans as a Model for Bardet-Biedl Syndrome and Cilia Function*

In humans, non-functional cilia cause a number of diseases including polycystic kidney disease and Bardet-Biedl Syndrome. *C. elegans* is a good model to study primary (non-motile) cilia because many of the genes regulating cilia are conserved between *C. elegans* and humans. In order to better understand the role of receptor localization in cilia structure and function, we have characterized a mutant (*my13*) that has not only defective receptor localization, but also defects in cilia-mediated processes. *C. elegans* homozygous for the *my13* mutation exhibit altered behaviors and structural abnormalities of the cilia. *my13* is a missense mutation in *osm-12*, an ortholog of human *BBS-7*, a gene known to affect human cilia function and to be involved in Bardet-Biedl Syndrome. My current analyses include identifying the nature of the mRNA transcribed from the *my13* allele and examining the interactions between *osm-12(my13)* and related genes.

**Danielle Anne Bronshteyn**  
Faculty Mentor/Collaborator: James E. Boulter  
Chemistry  
*Developing a New Analytical Method for the Determination of Biogenic Carbonyls Using HPLC-TOF/MS*

The goal of this project is to develop a quantitative analytical method to analyze carbonyl compounds in the atmosphere. Carbonyl compounds are pollutants that contribute to the formation of ground-level ozone; however the existing method of measuring them is not very accurate. Here at UW-Eau Claire, we have access to a sophisticated time-of-flight mass-spectrometer (TOF-MS), that can give very high mass resolution, a vast improvement over the instrument in the old method. We have already been able to use the TOF-MS to identify sample carbonyl compounds. Now we have established response factors to translate the data from the TOF-MS into real concentrations of the compounds. This will eventually allow us to collect real-world samples and identify not only which carbonyls are present, but what their concentrations are in the atmosphere.

**Thursday, May 2**

**Menominee Room**

**1:00-2:00**

**Moderators: Abby Rand and Megan McKeown**

**Mitchell L. Collins**  
Faculty Mentor/Collaborator: Christina M. Hupy  
Geography / Anthropology  
*A Look at the Changes in Student Enrollment in Wisconsin Public School Districts*

Trends in student enrollment have impacted many school districts throughout the United States as the population continues to go through changes. This study analyzes these changes in student enrollment in the state of Wisconsin as it greatly affects the amount of resources that a school district receives from the government. Whether a school district is significantly growing or declining in student enrollment, will have an impact on its budget. The methods include an analysis of several population variables such as median age, property values, birth rates, and percent change from 1997-2011 in enrollments per school district. Following the analysis of the different population variables with percent change of enroll-

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There is a significant relationship with median age, property values, and percent Hispanic in explaining change in student population throughout Wisconsin. Although changes in student enrollment can be explained by many broad variables, these are the major ones that show the greatest relationship with percent change. School district administrators can use demographic data such as these to plan for future years and lessen the impact of significant enrollment change on the quality of the school and help ensure they can accomplish the number one goal—student success and achievement.

**Nicholas Hans Jaeger**  
Faculty Mentor/Collaborator: **Harry M. Jol**  
Geography / Anthropology  
*Net-less Blogging: Disseminating Findings in Biblical Archaeology*

How do Biblical archaeologists distribute their findings on the Internet? The project focused on making web page development more understandable for Biblical archaeologists, while considering the constraints of putting their work online while in the field. The study holds particular importance because archaeological findings often take years to become available online. The first part of the project involved identifying what archaeologists want to put online and their current ability to do so. After reviewing the most popular approaches to web development and blogging, the project was tested in Israel on two “live” digs. The hypothesis was that the main obstacle of web development in Israel would be archaeologists’ knowledge of web development and blogging, but Internet availability, speed, and reliability proved to be an even larger obstacle. Lack of fast and reliable Internet access forced the project to rely on static web pages, which allowed the pages to be prepared onsite and then uploaded as Internet access became available. To deal with the obstacles at archaeological sites, the project developed a responsive template, designed to make readability and utilization easier for inexperienced web developers.

**Nicholas Hans Jaeger**  
Faculty Mentor/Collaborator: **Peter J. Bui**  
Computer Science  
*Collaborating Graphical Evidence: Distributed Photo Processing*

The goal of this project was to produce a system that could collect photos from a group of computers, and process and consolidate them in a central location for easy web access. The importance of this comes from projects involving groups of people trying to collaboratively analyze large image sets. The system, developed over the course of this project, utilized Dropbox to gather incoming photos, and then automatically processed and archived the photos using a computer cluster. The system, set up at the University of Wisconsin-Eau Claire, was tested from Israel, where it was used to collect photos from the members of an archaeological team. The system’s performance was limited by Internet availability and reliability, as well as upload speeds being throttled by the Dropbox software. The system, however, successfully processed and archived all of the photos taken by the archaeological team.

**Thursday, May 2**  
**Ho-Chunk Room**  
**1:00-2:00**

**Moderators: Kyra Witcher and Alex Brown**

**Lauren Rose Caldie** and **Shanda Ransom**  
Faculty Mentor/Collaborator: **Otrude Moyo**  
Social Work  
*Exploring the Significance of the African Worldview Ubuntu in Social Welfare Provisioning in Fort Beaufort, South Africa*

Researching any topic in Africa when one is an ‘outsider’ presents many ethical challenges, for example, the politics of engaging research conceptualized outside the context of the research site. First, this oral presentation shares our experience of doing research as outsiders in South Africa. Second, we explore the questions: What is Ubuntu? Is Ubuntu a reality or a myth in contemporary South Africa? How is Ubuntu influencing social welfare provisioning in Fort Beaufort, South Africa? These are questions we asked the Xhosa community of Fort Beaufort and surrounding areas. We engaged them in conversations about their conceptualization and experience of Ubuntu. From our conversations we found that Ubuntu is considered both a myth and reality to South Africans. We found people eager to engage Ubuntu in relation to the right way to live, what to teach the younger generation and ways of living the African way even within the experience of poverty for the many and wealth for a few.
Mai Neng Vang  
Faculty Mentor/Collaborator: Christin A. DePouw  
Education Studies  
*Psychology and the Hmong American Community: A Critical Reflection on Social Science Methodologies*

Within the social sciences, there is too often a lack of critical appraisal regarding the traditional western scientific framework used when working with communities of color; this contributes to the institutional marginalization of people of color. One example of this would be deficit thinking in conducting research on minority populations (i.e. blaming individuals, parents, and/or culture for the problems that exist in the population). Changes in scientific methodologies are necessary to incorporate all relevant information in order to account for the salient complexities within a community of color. This research highlights a case study of the researcher’s experiences conducting a study on parenting styles within the Eau Claire Hmong community. The investigator will analyze how current research methodologies often interpret findings using deficit thinking when working with the Hmong community. This research also discusses the necessity of incorporating a critical race theory perspective and involving individuals from the community in the construction of study design.

Laurelyn Elise Wieseman  
Faculty Mentor/Collaborator: Rose-Marie Avin  
Economics  
*“Maria Elena Cuadra,” Globalization, and Women’s Empowerment in Nicaragua*

One important aspect of globalization is the rapid expansion of trade between nations through the creation of factories, also known as *maquilas*, in Free Trade Zones (FTZs). In Nicaragua, the sector has exploded since 1990 and has become a significant source of employment for poor women who lack formal education. One organization based in Nicaragua that works to empower women is the *Working and Unemployed Women’s Movement “Maria Elena Cuadra,”* also known as “Maria Elena Cuadra” (MEC). MEC’s primary projects include organizing female FTZ workers in Nicaragua and working to improve *maquila* factory conditions. MEC organizers have also developed a concept of “integral” or holistic work by creating programs that address women’s needs and interests not only in the workplace but also at home and within communities. This research project evaluates the positive and negative impacts of the *maquilas* located in Granada, Nicaragua on the lives of twenty-nine women who work there. Dr. Rose-Marie Avin and student Laurelyn Wieseman spent three weeks in Granada, Nicaragua during July 2012, where they conducted interviews and/or surveys with these women. The qualitative and quantitative findings paint a picture of the daily lived realities of *maquila* workers as reported by the women themselves.

**Thursday, May 2**  
**Menominee Room**  
**2:00-3:00**  
**Moderators: Heidi Feyereisen and Ben Thompson Isaac**

Erika Ann Andrle  
Faculty Mentor/Collaborator: Vicki M. Samelson  
Communication Sciences and Disorders  
*Cognitive and Linguistic Characteristics of Adolescents with Asperger’s Syndrome: Two Case Studies*

Asperger’s Syndrome (AS) is a well-known developmental disability, but research describing the cognitive and linguistic characteristics is conflicting. The existing literature suggests heterogeneity in academic skills, social skills, behaviors, and concomitant diagnoses, however past research has focused primarily on group data. Consideration of individual differences within this population is essential and may benefit individuals with AS academically, socially, and during the transition from high school to adulthood. Two case studies are presented, describing the participants’ unique characteristics and how these characteristics may or may not relate to the scores and observations obtained from a battery of language, cognitive, and academic assessments. The aims of this research study were to describe the cognitive and linguistic profiles of two adolescents with AS and consider how their profiles may influence academic and social interactions in high school and in the transition to post-secondary education or employment. The results of this study indicated that each participant exhibited strengths and challenges in the battery of assessments. While both participants scored similarly on formal cognitive and pragmatics assessments, considerable differences were observed in writing and math skills, awareness of their diagnoses, and informal pragmatics skills. These results illustrate the individual differences seen across individuals with AS.
Alysa Rene Firkus  
Faculty Mentor/Collaborator: Jerry K. Hoepner, Abby L. Hemmerich, and Vicki M. Samelson  
Communication Sciences and Disorders  
Pedagogical Preparation of Instructional Interns

The American Speech-Language and Hearing Association has an initiative to develop new teachers and leaders who may be interested in pursuing an advanced degree. One way that the Communication Sciences and Disorders department at the University of Wisconsin-Eau Claire has addressed this is through the instructional internship program. This program allows undergraduate students the opportunity to assist the instructor and learn and apply teaching pedagogies. To document changes in perspectives on teaching, students in the instructional internship provided reflections before and after the experience. Additional student comments were elicited through an online discussion forum and an open midterm discussion. Faculty observations and ratings were elicited through a Qualtrics survey. These reflections were coded using open and axial coding methods. The main qualitative outcomes included solidifying their own knowledge of course content, satisfaction of facilitating student learning, the appreciation of the teacher workloads, and focus on how they will apply this knowledge to their future careers as Speech Language Pathologists. The instructional internship is helping students learn and preparing them to become effective clinicians, supervisors, and potential researchers.

Kelsey Aryne Dumanch and Racheal Marie Cowan  
Faculty Mentor/Collaborator: Abby L. Hemmerich and Jerry K. Hoepner  
Communication Sciences and Disorders  
Self-Assessment: Influence of Study Skills Training and Interactive Review Sessions on Learning in an Anatomy and Physiology Course

Learning in the college environment is fast-paced and can be a struggle for students who are not aware of their learning styles. When students are more aware of their knowledge, they can focus their studying in a more productive manner and improve learning through self-assessment and distributed review. The purpose of this study is to gather data related to student self-assessments of learning and to determine whether study skills training and interactive review sessions lead to improved learning, self-awareness, and performance on exams. Fifty-seven students from an undergraduate course, Anatomy and Physiology of Speech and Hearing, received study skills training, and participated in pre-exam interactive review sessions. Students rated readiness prior to each exam, and participated in post-exam debriefing sessions. Preliminary quantitative data suggest high-achieving students have lower confidence levels, underestimating their knowledge, while low-achieving students tend to have higher confidence levels, overestimating their knowledge. Both quantitative and qualitative data show most students have become more aware of their learning styles and have developed better study strategies over the course of a semester. This suggests that the use of self-assessment and self-directed review can help develop learning skills and further the development of awareness of knowledge.

Thursday, May 2  
Ho Chunk Room  
2:00-3:00  
Moderators: Alex Brown and Megan Chilman

Jessica Susan Krause  
Faculty Mentor/Collaborator: Otrude Moyo  
Social Work  
Exploring the Impact that Social Workers Have on Both the Client and Criminal Justice Systems through Treatment Courts in Eau Claire County

The purpose of this research is to explore the following question: How are social workers’ involvement in treatment/specialty courts impacting client functioning, and the operational construct of the criminal justice system? Treatment courts are fairly new phenomena in the United States, emerging in reaction to increased problems of jail overcrowding and substance abuse in the early 1990’s. Social workers are offered a very pivotal role in treatment court teams, working both with the client on the micro level and within the criminal justice system on the macro level to effect positive change. They navigate through a variety of factors influencing both client and system including theories and beliefs on multiculturalism, faith, race, rehabilitation, gender, while at the same time developing cohesion and encouraging collaboration between both client and system. The presentation will share preliminary findings on the role of the social workers in treatment courts, highlighting the useful but challenging role of social workers in the courts.
Danielle Hochhalter  
Faculty Mentor/Collaborator: **Leah Olson-McBride**  
Social Work  
*An Examination of the Impact of Outside Payment Sources on Elderly Residents and Health Care Providers in Long Term Care Facilities*

The purpose of this research is to investigate the efficiency of outside payment sources, such as Medicare, Medicaid, Community Health Partnerships, and Long Term Care Insurances in long term care facilities. As the population grows increasingly older, social workers must work to ensure that this growing population is taken care of in a sufficient manner. In order to guarantee a high level of care for such elderly population, outside payment sources need to be efficient in regards to communication, reimbursement processes and funding. In order to test the impact of outside payment sources on health care professionals and elderly residents, interviews of ten health care administrators within Eau Claire County were conducted. The interviews were semi-structured and consisted of both qualitative and quantitative questions. The results of the research showed that on average reimbursement rates were too low, slow and required a significant amount of time, communication with outside payment sources was neutral and resident understanding of outside payment sources was poor. Suggestions to improve outside payment sources were an increased and more efficient reimbursement rate, create a more uniform system, decrease complexity and have more communication inside the actual building.

**GRADUATE STUDENT POSTERS**

**NURSING**

Jessica Rae Witt (267)  
Faculty Mentor/Collaborator: **Susan D. Moch**  
*Need for Re-evaluation of Distress Responses in Families with Chronic Pain*

The adverse effects of chronic pain reach beyond the individual sufferer to have implications on the entire family. Chronic pain introduces unique psychological, social, and economic challenges into family life. Increased emotional and psychological distress responses occur in family members due to accumulating responsibilities and financial strain. However, investigations re-evaluating these responses within the context of the economic recession are lacking. Additionally, the economic recession has increased emotional and financial stress for many families in the United States. The purpose of this presentation is to describe distress responses in family members of individuals with chronic pain and to emphasize the need for re-evaluation given the economic recession. A literature search was conducted in EBSCOhost including all supported databases. In-depth review of family responses to chronic pain revealed many associations with economics. Therefore, a review of literature related to studies that connect the two areas is continuing. A question that emerged through this review is: How do the family responses to chronic pain interact with recession-related family responses to affect family adaptation, health, and overall well-being? Further research to investigate the occurrence and interaction of financial stressors and cumulative distress responses is critical given dramatic changes in the economic environment.

**PSYCHOLOGY**

Glenna A. Bieno (261)  
Faculty Mentor/Collaborator: **Mary Beth Leibham**  
*The Effectiveness of a Post-Secondary Readiness Intervention in Increasing Students’ Academic Preparation Knowledge: Self-Efficacy as a Mediating Factor*

Students least likely to attend college are first-generation students, minority students, and students from low socio-economic statuses (SES) (Perna, 2000). The current study examines the effectiveness of the Blugold Beginnings program on increasing middle school students’ academic preparation knowledge (APK) over the course of the one-year intervention. Specifically, the study examines intervention students’ overall knowledge gain (e.g. standardized tests, rigorous coursework, study skills) from a pre-test to a post-test of the yearlong intervention. A second aim of the current study is to examine self-efficacy as a mediating factor in students’ APK gain over the course of the intervention. Using a survey, students’ overall APK gain from a pre-test to a post-test was analyzed using the method of a repeated measure ANOVA. Self-efficacy as a mediating factor in students’ APK gain over the course of the intervention was analyzed with the use of a regression analysis. Research on the effectiveness of college readiness programs on increasing APK is necessary to
understand how these factors work in accordance to promote college enrollment. Understanding the role that self-efficacy plays in post-secondary readiness is also crucial to supporting students, especially first-generation students, in accessing post-secondary education.

Jennifer Ann Birkhofer (260)
Faculty Mentor/Collaborator: Melissa Coolong-Chaffin
External Collaborators: Dana Wagner, Augsburg College, Joseph Demers, University of Minnesota, and Abbey Karich, University of Minnesota
*When Consultation Doesn’t Work: Exploring Barriers to Processes and Outcomes*

The purpose of this presentation is to explore teachers’ and consultants’ perspectives on barriers to the process and outcomes of consultation. Oftentimes interventions are not effective in applied settings, however, the obstacles are rarely thoroughly studied. This mixed-method study examined the effectiveness of consultation and consultation-developed interventions on oral reading fluency (ORF) of struggling English Language Learners (ELL) students along with qualitative data describing teacher perspectives. Results are summarized in a framework adapted from Christenson (2003) involving both structural and psychological barriers for teachers and consultants to effective consultation practice.

Kimberlee Marie Maczko, Karissa E. Danes and Kaitlin M. O’Shea (262)
Faculty Mentor/Collaborators: Melissa Coolong-Chaffin and Michael I. Axelrod
*Training Undergraduate Students to Implement Brief Experimental Analysis as Part of an After-School Reading Program*

School psychologists are faced with the challenge of helping teachers match evidence-based academic interventions to student needs. With limited resources, schools must become creative in order to provide the necessary supports to their students. The present study involves a partnership between the UW-Eau Claire Academic Intervention Clinic (AIC) and local elementary schools in which school psychology graduate students supervise undergraduate students as they deliver evidence-based reading fluency interventions to 32 struggling 2nd and 3rd grade students in an after school program. Twenty undergraduate students were trained by AIC staff to use brief experimental analysis (BEA) techniques as a way to “test drive” different interventions in order to select a promising intervention for each participant. Once an intervention was selected for each participant, the undergraduate interventionists administered the intervention two times per week and collected outcome data to measure the effectiveness across time. Dependent variables include curriculum-based measures of reading. Results indicate that a promising intervention was identified for each participant. Data collection is ongoing, but initial results indicate growth in reading fluency for participants. The present poster highlights how nontraditional interventionists can be trained to conduct BEAs and implement the interventions resulting in positive outcomes for struggling readers.

Kaitlin M. O’Shea (263)
Faculty Mentor/Collaborator: Michael I. Axelrod
*The Effectiveness of an Intervention Package of Repeated Reading and Error Word Drill Using iPad Technology*

As schools adopt the Response to Intervention (RtI) framework, research in school psychology has focused on exploring interventions to help struggling readers remediate their skills. At the same time, schools are becoming increasingly interested in investigating the ways in which technology can be incorporated into their service delivery through curriculum, instruction, and intervention. The present study sets out to explore these two areas of interest in education. In this study, the researcher was interested in investigating whether combining the evidence-based interventions of Repeated Reading, which emphasized practice and repetition, and Error Word Drill, which emphasized feedback and drill, produced greater gains in oral reading fluency when compared to the effects of the individual interventions for four elementary-aged students. The results suggested that the combination of the interventions did not significantly increase students’ oral reading fluency. In addition, the researcher was interested in exploring the students’ perceptions of using iPads as part of intervention implementation. The results were mixed; two of the students found the iPad to be an acceptable component of the intervention, while the other two students did not prefer to use the iPad during the intervention. Limitations and implications for the field of school psychology are discussed.
Megan Ashley Eparvier (264)
Faculty Mentor/Collaborator: Michael I. Axelrod
School Psychologists’ Perceived Effectiveness and Social Acceptability of Social Skills Interventions for Students with Autism Spectrum Disorders

This research examined the perceived effectiveness and social acceptability of social skills interventions for use in schools as rated by school psychologists. The research will present which of the four interventions investigated are perceived to be effective and socially acceptable. Results are expected to indicate that each intervention is perceived to be effective in improving children’s use of positive social skills, but are not maintained after discontinuation. In addition, results are expected to indicate that each of the four interventions investigated is rated socially acceptable for use in schools. The correlation between the social acceptability and perceived effectiveness of interventions will also be discussed.

Karissa E. Danes (265)
Faculty Mentor/Collaborator: Michael I. Axelrod
Adding Student Choice to a Repeated Reading Intervention

In today’s education system, reading skills are essential to student success. When assessing student progress, there currently is an expectation to respond with evidence-based interventions targeting specific skill deficits (Reschly, 2008). Therefore, research investigating the effectiveness of various reading interventions, including interventions targeting reading fluency, is critical. Effective interventions that work to improve oral reading fluency typically contain aspects of practice and feedback. Repeated reading is one particular intervention that is extensively supported in the literature, and incorporates both of these aspects. Previous research and other educational resources have suggested that choice influences the learning process in multiple ways, from increasing student motivation or interest to making learning meaningful for the student (Alexander, 2006; Glasser, 1997). The purpose of this study was to investigate the effects student choice of reading passages had on a Repeated Reading intervention for three below-average readers in grades 2, 3 and 5. Each student was exposed to two intervention conditions, Repeated Reading alone and Repeated Reading plus student choice of reading passage. The primary variable under analysis was oral reading fluency. Discussion will focus on the impact of including student choice of reading passages within the context of evidence-based reading interventions.

Matthew Emmett Mitchell and Danielle Marie Meyer (268)
Faculty Mentor/Collaborator: Mary Beth Tusing
Do Curriculum-Based Measurement Scores Predict Post-Secondary Readiness?

Educators and employers have expressed concern about the readiness of high school graduates for further education, the workforce, or the military (McGaughy, 2012). To examine this concern we used archival data from a Midwestern school district to evaluate the predictive validity of 6th grade AIMSweb (a curriculum based measurement tool (CBM)) screening scores for subsequent performance on the Wisconsin Knowledge and Concepts Exam (WKCE) in 8th grade. AIMSweb measures of Oral reading fluency (R-CBM), reading comprehension (MAZE), and mathematical concepts and applications (M-CAP), were used to obtain 6th grade screening scores. The sample consisted of 311 students (44% female, 46% male). Understanding how CBMs predict future performance on large state tests could help educators monitor if students are progressing towards being ready for life after secondary school. Descriptive statistics, correlations, and regression analyses were used to interpret the data. AIMSweb screening scores were found to correlate with future performance on the WKCE. R-CBM was the best predictor for future performance on the WKCE and interestingly was a better predictor of future math performance than (M-CAP).

Charlene Marie Cardona (269)
Faculty Mentor/Collaborator: Mary Beth Tusing
Examining English Language Proficiency and Rates of Improvement in English Language Learners: A Prospective Study

Within Response to Intervention, Curriculum Based Measurements (CBMs) are used to inform school personnel ways of addressing student needs in terms of reading, writing, and mathematics. Research proposes that the rate of improvement in reading probes is the primary indicator of the effectiveness of the intervention. With more students of diverse languages attending schools, rate of improvement in these assessments could serve as a fairer portrayal of their academic abilities. First, this study will explore rates of improvement in CBMs in both English Language Learners (ELLs) and Native English Speakers. Second, this prospective study will also examine the relationship between English Language Proficiency in ELLs and the Rate of Improvement in CBMs. Third, this study will compare English reading growth across different languages spoken (Hmong, Spanish, English) and across grade levels (2nd - 5th grade). Finally, this study’s findings will
provide additional information on how to best assess ELL students. We expect that students whose language proficiency is lower will have lower rates of growth when compared to students who are Native English Speakers. Alternatively, we expect that students whose language proficiency is higher will have similar rates of growth when compared to students who are Native English Speakers.

UNDERGRADUATE STUDENT POSTERS

EDUCATION AND SCHOLARSHIP OF TEACHING AND LEARNING

CHEMISTRY

Rachel Ellen Egdorf (126)
Faculty Mentor/Collaborator: Roslyn M. Theisen
Investigation of Student Attitudes and Understanding In General Chemistry

This research project is to study the effect of adding one inquiry-based laboratory experiment, in place of a traditional verification “cookbook” laboratory experiment, on student attitudes and understanding on the subject of stoichiometry in the first semester General Chemistry. The goal of this study is two-fold; the first is to gather information about the impact of a guided inquiry laboratory experiment on students’ learning and the second is to gather information regarding student attitudes towards the subject of chemistry. The guided inquiry laboratory experiment and attitude surveys are intended to benefit student learning in the future and also assist in fostering positive attitudes for the sciences. Determining what the students gain from the guided inquiry laboratory experiment will help us to determine whether we should incorporate similar types of guided inquiry laboratory activities into other laboratory courses.

Emily Hoida (125)
Faculty Mentor/Collaborator: Cheryl L. Muller
Patterns of Student Effort in General Chemistry

The goals of the study were to determine 1) when students were studying throughout the semester, 2) whether the time spent studying had an effect on course success, 3) what study techniques students were using, and which were most useful, and 4) which course assignments motivated students to study. Data was collected via Qualtrics survey, prompting students to report each day for a week, for 3 weeks out of the semester (week 3, week 7, and week 10). The survey included questions on their activities that day, assignments they had coming up, the time they studied in 15-minute increments. Students also completed a modified Motivated Strategies Learning Questionnaire at the end of the third week. A notable finding was that the majority of students in Chem 103 reported spending less time studying during the second and third survey weeks compared to the first week. The amount of time spent studying during the three weeks did not correlate with overall course success.

DEAN OF STUDENTS

Khue Yang (208)
Faculty Mentor/Collaborator: Lissa Jo Martinez Greer
Blugold Beginnings Impact of Mentoring on Mentors

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

**EDUCATION STUDIES**

**Monet Marie Barnes (206)**
Faculty Mentor/Collaborator: Yun-Ting Hung

*Domestic Intercultural Immersion within the Somali Community: Fostering an Understanding of Diversity and Immigrant Experiences in the Midwest*

The purpose of the Somali Immersion was to give pre-service teachers at Eau Claire a greater understanding of the Somali culture and their immigrant experiences. By fostering a deep understanding of one underrepresented community of language learners, pre-service teachers can develop a more positive attitude toward other underrepresented and misunderstood cultures as well. During this experience, fourteen undergraduate students engaged in more than twenty four hours of classroom-based instruction, a week-long, full-day, field placement in schools that serve primary Somali youth, and daily excursions in and around the Somali community in Minneapolis, MN. To assess the effectiveness of this experience in transforming participants’ insights and understandings, students were given a pre and post-survey to assess multicultural awareness and knowledge of the Somali culture and were interviewed after the experience. Student interviews and post-survey results showed that pre-service teachers were able to gain a sense of empathy and a greater understanding of cultural differences in an urban school setting through this cultural immersion. It is recommended that all pre-service teachers engage in an intercultural immersion or intercultural experience in order to better prepare them for the diversity that exists within our schools, and to develop a broader worldview for diverse learners.

**Mai Nhia Xiong** and **Kia Thao (205)**
Faculty Mentor/Collaborator: Incho Lee

*Multiplicities and Complexities: Examination of Teacher Educators’ Perceptions of Diversity and Multicultural Education*

The current study examines teacher educators’ perceptions of multicultural education and the ways they incorporate diversity into their courses. Adopting the Gorski’s (2009) theoretical framework, we perceive multicultural education as a way to critique and respond to discriminatory policies and educational practices that marginalize underrepresented students. The key research questions include 1) How do teacher educators define diversity and multicultural education; 2) How do they incorporate diversity into their courses; and 3) What challenges do they have in the implementation of multicultural education. We will interview five current teacher educators in the higher education institutions in the US. Using qualitative thematic analysis method, we will investigate the ways teacher educators’ perceptions and practices contribute to the creation of 1) equitable school environments that help the underrepresented students reach their full potential, 2) curricula that challenge social inequalities and investigate ways to eliminate social injustice, and 3) educational practices that contribute to the transformation of the society. This research will encourage teacher educators, preservice teachers, and inservice teachers to investigate their own curricula and educational practices with respect to White supremacy, inequity, and social injustice.

**ENGLISH**

**Christa Lentz (175)**
Faculty Mentor/Collaborator: Katherine S. Hinnant

*The Information Cycle: An Online Learning Object for the Blugold Seminar in Critical Reading and Writing*

One of the major learning goals of the Blugold Seminar in Critical Reading & Writing (BGS) is that students develop and demonstrate inquiry and research skills throughout the semester. These skills require that students not only be able to find information, but also evaluate where what they find fits in the overall “conversation” on their topic of inquiry. In order to add to the library instruction that students receive, we have worked toward developing a series of online learning objects that can be used in the classroom or outside of class. Our first project, an adaptation of the Penn State “Information Cycle” is particularly adapted to the BGS curriculum, involving both rhetorical and contextual understandings of the development of information. We are currently assessing our movie, now shown in the majority of BGS sections, and hope to share some preliminary findings in May.
FOREIGN LANGUAGES

Madeline Louise Bires and Katie DeStefano (145)
Faculty Mentor/Collaborator: Kate Mastruserio Reynolds

Teaching Strategies of ESL versus Mainstream Teachers

An instructional paradigm entitled content-based instruction (CBI) has changed the manner in which English as a Second Language (ESL) and mainstream teachers engage learners in their classrooms. In this instructional model, teachers are to differentiate instruction for a variety of diverse learners in their classrooms. Many mainstream teachers receive little training in ESL instruction (DeJong & Harper, 2009) and report that the strategies they learn are the same as “good teaching” strategies (DeJong & Harper, 2009). In this qualitative study, we observed two ESL and two mainstream teachers, who were considered “excellent” teachers by their peers, in order to determine what instructional strategies were employed by each group, the frequency of these strategies, and whether the two groups differentiated instruction similarly or differently. Our findings showed that among these two groups of excellent educators, there were several aspects of effective instruction they shared; however, they were notably different in some areas, ESL training for mainstream teachers should include strategies supported by second language acquisition (SLA) research. These strategies and their connection to SLA research must be made explicit in order to create classroom environments that are likely to help English language learners learn effectively.

Lillian Mae Forsman (155)
Faculty Mentor/Collaborator: Anne Cummings Hlas

High-leverage Teaching Practices in Early Second Language Learning

In this project, we set out to discover how teacher candidates execute high-leverage teaching practices (HLTP) in an early second language learning practicum. The purpose of this research is to identify HLTP that may provide higher gains in student learning over other teaching practices, provide evidence of said gains, and develop materials and assessments to teach and evaluate these practices and their use in Foreign Language Exploratory (FLEX) classrooms. To accomplish this, we selected three HLTP, taught them in an ES 437 class, observed and recorded how the practices were used in FLEX classes, interviewed the participants about their experience with HLTP, and did both qualitative and quantitative analysis of the data we collected. We learned about the difficulties and successes participants experienced with the HLTP, which practices were easier to implement over others, and which practices the participants found to be most effective. In the future, we would like to determine the next steps in this research and observe how the participants from ES 437 use HLTP in their student teaching experience.

Claire Catherine Lind (144)
Faculty Mentor/Collaborator: Kate Mastruserio Reynolds

General Education Teachers’ Readiness for ESL Students

This study explored the readiness of general educators in the public K-12 classrooms for the inclusion of ESL (English as a Second Language) students. The number of ESL students is growing, and the trend will continue to do so into the next several decades (Fry, 2008). It is important for today’s teachers and future teachers to be aware of the growing number of ESL students in order to help them find success in their academic careers. It was hypothesized that teachers in the public schools have not had enough training to feel comfortable teaching ESL students, because they lack preparation in their university teacher education programs or in in-service trainings once in the work place. Data collected included interviews and an electronic mixed-methods survey of 200+ educators. Findings will be reported to highlight teachers’ self-reports of their readiness and comfort in meeting the needs of English Language Learners (ELL). Furthermore, ways that general educators believe will better prepare them for ELL inclusion will be shared.

Laura Jean Szymanski (156)
Faculty Mentor/Collaborator: Jessica S. Miller

Improving Oral Proficiency with Technology: A Give and Take

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

**Chelsey R. Winkler and Samara Sarahi Gaitan (146)**
Faculty Mentor/Collaborator: **Meghan Kathleen Mehlos**

*How do Heritage Spanish Speakers’ Experiences in the Spanish Classrooms Influence the Creation of their Identities in Terms of what they Associate with the Varieties of Spanish they use in Class and in the Community?*

The research studied how heritage Spanish speakers’ experiences in the Spanish classrooms influence the creation of their identities in terms of what they associate with the varieties of Spanish they use in class and in the community. Knowledge of heritage speakers is important in foreign language classrooms when teachers are designing curriculum and lesson plans. Using a combination of theoretical research and interviews with students, faculty, and parents from Arcadia High School, we were able to gain understanding of how heritage speakers form their identities. In our conclusions, we found that heritage speakers in Arcadia differentiate the Spanish spoken in the classroom from the Spanish they speak at home, and tend to express conflicting views about the legitimacy or value of the variations of Spanish that they speak in terms of potential use in the future, the workplace, or both.

**INFORMATION SYSTEMS**

**Tyrrell Frank Wirkus (235)**
Faculty Mentor/Collaborators: **Jean A. Pratt** and **Anthony C. Keys**

*Are Information Systems Graduates Prepared for a Complex Society?*

The goal of this project was to examine to what extent U.S. programs of Information Systems (IS) are aligned with their university’s liberal education learning goals. Another focus of this research was to develop a model aligning relevant curricula guidelines. As businesses continue to grow, they will require graduates with a cross-disciplinary knowledge and skill set. The reason for this research was to determine if IS programs in the U.S. are designed to meet these emerging business requirements by preparing graduates to succeed in an increasingly complex, global society. The method we used was random selection followed by qualitative analysis. Of all the Association to Advance Collegiate Schools of Business (AACSB) accredited colleges in the U.S., we randomly selected 83 universities and examined whether or not their website contained IS learning objectives and how well they were aligned with existing university learning goals. We found that only 6 universities out of the 83 sampled had both university and program learning goals published but none of them were aligned. We conclude that the IS curriculum will need to be redesigned to open the narrow silo approach by including more disciplines resulting in more diversified graduates who are ready for the ever-evolving business world.

**MATHEMATICS**

**Matthew Lester Bowe (95)**
Faculty Mentor/Collaborator: **Christopher S. Hlas**

*Self-Determination and Flow Theories Applied to Mathematics Homework*

The purpose of our research endeavor was to find a baseline that could be compared to varying the level of choice of mathematics homework and the current level of achievement and motivation (based on self-determination theory and flow theory), and then finding how the level of choice affects the level of achievement in later studies. This research will help educators in general by showing that such motivating factors like confidence and skills are strongly correlated. We collected data by having students answer a survey of questions, after completing their homework assignments, that asks about perceived choice, competence, relatedness, and flow when doing the homework. Further, we collected the homework scores that were connected to the appropriate surveys and found relationships among the survey variables. Using the Statistical Program for the Social Sciences, we found many significant positive and negative correlations, moderately positive and negative correlations, and no correlations among our variables. Some examples include confidence vs. skills (.755) and challenge vs. control (-.391). With this data, we hope to be able to provide recommendations for going forward with this research.
Erin Jo Gadient and Alexander Thomas Nicholson (116)
Faculty Mentor/Collaborator: Jennifer L. Harrison
Transforming Mathematics Content Courses for Teachers Through Integration of Cognition Based Assessment Learning Progressions

This research project investigated the impact of integrating learning progressions of children’s mathematical thinking into a mathematics content course for pre-service elementary teachers (PSTs). As future teachers, understanding children’s cognitive processes is vital in furthering the children’s progress in mathematics. PSTs enrolled in their first mathematics for teachers course were asked to consider children’s work to assess the strategies used as well as recognize what understanding was demonstrated. By assessing a pre- and post-test, we analyzed the PSTs recognition of what understanding was demonstrated by the children. In addition we measured PSTs’ beliefs (pre and post) about children’s learning, stages of learning, and teacher practices by using the Likert-scale Mathematics Beliefs Scale (MBS, Capraro, 2001). The results indicated that pre-service elementary teachers demonstrated a substantial shift towards constructivist beliefs about mathematics teaching and learning, as well as the development of more conceptual and accurate analyses of children’s mathematical thinking.

Lyle David Paukner (96)
Faculty Mentor/Collaborator: Christopher S. Hlas
Deliberate Practice in Mathematics

Deliberate practice is a form of practice that consists of focused, repetitive practice of above-average difficulty. The subject continuously monitors his or her performance, and subsequently corrects, experiments, and reacts to immediate and constant feedback, with the aim of steady and consistent improvement. In our study, we have attempted to discover practice techniques that encourage students to deliberately practice algebraic skills. We identified two techniques we believed fit into the model of deliberate practice. The first were “step-by-step” problems, in which participants were asked to solve a very complex problem step-by-step and given corrective feedback between each question. The second type of problems were “scaffolded” problems, where students were given simple problems that built toward a more complex problem. Feedback was given after each complete problem. Volunteers for the study were first given a pretest to identify specific algebraic skills they struggled with, and then assigned to either the “step-by-step” group or the “scaffolded” practice group. Following the practice, volunteers were given a post-test to measure improvement, and the results were recorded. Results are still being collected and sorted, and will be presented on the day of the event.

Daniel Christopher Schilcher, Leah Elizabeth Grancorvitz and Lindsey Lee Alger (65)
Faculty Mentor/Collaborators: Sherrie J. Serros and Claudia M. Giamati
Explorations in the Newly Developed Common Core

In 2010, Wisconsin adopted the Common Core State Standards. These standards are becoming the basis for K-12 curricula nationwide. Covered in the document are the concepts that students need to learn as well as the level of education at which the concepts should be learned. Wisconsin has chosen the Smarter Balanced Consortium for Assessment to develop common assessments to evaluate student learning. Our research this summer focused on ways of assessing progress in conjunction with the common core. We familiarized ourselves with the standards and their history, and then we looked at various unpacking of the standards. Numerous efforts across the country involve the development of tasks through which students learn concepts and become accustomed to various types of assessments. The depth of knowledge and emphasis on mathematical habits of mind are new and teaching resources are needed. After a review of many standards-based performance tasks we worked to develop authentic tasks for classroom use.

Dana Lynn Underdahl (115)
Faculty Mentor/Collaborator: Jennifer L. Harrison
Using Learning Progressions to Assess Student Understanding

The purpose of this independent study project was to explore how teaching mathematics using learning progressions at the elementary level to inform instructional decisions, impacted student understanding of mathematical concepts. In an educational society that relies heavily on high-stakes testing to determine the success of children and schools, it is important that we explore new teaching strategies, such as this, to improve students’ mathematical performance and understanding of the subject. To explore this topic, I individually taught a second grade student using Cognition-Based Assessment learning progression materials for fifteen minutes each day, for a 4-week period. Specifically, we focused on place value and addition/ subtraction concepts. Each day, I analyzed the student’s responses and demonstrated level of understanding.
to provide practice and teaching to move the student through developmental levels of thinking. Through analysis of data from my study, I found evidence that teaching using learning progressions was mostly successful in helping to increase the student’s overall understanding of mathematical concepts.

**MUSIC AND THEATRE ARTS**

Heidi Rose Joosten and David Ray Sumner (136)

Faculty Mentor/Collaborator: Nicholas S. Phillips

*Sight-reading with Technology: Using an iPad to Teach Students Piano Sight-Reading Skills*

We used two iPad apps, Wessar and Home Concert Xtreme, to address piano sight-reading with students in MUSI 108 (Advanced Class Piano). We wanted to see how students learned using technology, and whether they did so more effectively/efficiently than with a more traditional approach. By erasing measures at a steady tempo, the Wessar app aimed to help students look forward, as the ability to go back to fix mistakes is gone. The Home Concert Xtreme app connects with a keyboard using a MIDI interface and is more interactive with the student, helping with accuracy of notes. Overall, we observed that student response was positive, and they agreed that it helped improve their sight-reading (especially chorale-style), but they seemed to prefer sight-reading with traditional paper music to using the apps.

**PSYCHOLOGY**

Jessica Joy Hofer (216)

Faculty Mentor/Collaborator: Michael I. Axelrod

*Service Learning in the Lac du Flambeau Reservation Community: The Impact of Service Learning on Undergraduate Participants’ Multicultural Awareness and Sense of Civic Responsibility*

This study revolves around exploring the impact of a 30-hour multicultural service learning experience set on the Lac du Flambeau Indian Reservation. The research has several areas of investigation. We organized this study to determine how this service learning program impacts undergraduate students’ multicultural awareness and sense of civic responsibility, specifically in regards to participants’ levels of comfort working with American Indian children and understanding of the economic, social, educational, and health challenges facing individuals living in the Lac du Flambeau community. Additionally, we studied the unplanned adjunctive learning that occurred as a result of the experiences the participants had on the reservation, particularly regarding the acquisition of knowledge about American Indian (specifically Ojibwe) history and culture. Data was collected using quantitative surveys and qualitative questionnaires administered to participants both before and after the service learning experience.

**FINE AND PERFORMING ARTS**

**ART AND DESIGN**

Catelyn Jean Mailloux and Megan Elizabeth Byron (266)

Faculty Mentor/Collaborator: Jason A. Lanka

*River Bend Art Project: Relational Art in the Chippewa Valley*

This project was incentivized by an interest in relational art, a currently developing field within contemporary art. French art critic Nicolas Bourriaud defined the approach simply as,

*A set of artistic practices which take as their theoretical and practical point of departure the whole of human relations and their social context, rather than an independent and private space.*

Contrary to traditional art practice, relational art places an emphasis on the process of social interaction in the creation of art rather than the end form. The cultural context for this interaction in our research was school-aged children throughout the Chippewa Valley. Our interaction was focused around responses to flooding along the Chippewa Valley State Trail. The students were asked to respond to questions about loss, preservation, and rebirth through drawings. The final installation reflects collaboration between artist and community. Made up of hundreds of small sculptures and seven plexiglass drawings, it explores a dialogue about varied reactions to disaster and restoration. Our research is defined by the process of creating the installation as well as the altered perceptual experience of the flood plain by the users of the Chippewa Valley State Trail.
Our journey to the Scottish isles of Orkney allowed for an immersive artistic experience in which we learned to capture and portray the Orcadian landscape and culture in which we lived and worked for six weeks. Through on-site drawing of subjects, from wildlife and seascapes to architecture and town, we worked from life whilst cultivating our technical and observational drawing abilities. On-site drawing enhanced our knowledge of key artistic elements of perspective, color theory, and the conceptual process of submerging oneself in serious *en plein air* study. Our art was created primarily with oil pastel, carried daily to each site, where we first observed and explored the area before selecting a subject to draw. We left Orkney with a rich knowledge of Orcadian history, both cultural and natural, as well as a new intercultural perspective on art and life, and we returned home to Wisconsin with a body of artwork reflecting our learning experience.

**MUSIC AND THEATRE ARTS**

Jordyn Elizabeth Beranek (234)
Faculty Mentor/Collaborator: Mitra M. Sadeghpour

“I Only Wish I Could Draw it as Fine as it Was”: The Romanticization of Baby Doe and Violetta Valéry

The courtesan has been a subject of fascination for thousands of years. Notable courtesans include Cleopatra and Thais from ancient days, Veronica Franco from 16th century Venice, and the 19th century Parisians Marie Duplessis, Cora Pearl, and La Païva. Even today, the courtesan is still portrayed in movies like *Pretty Woman* and *Moulin Rouge*. The most famous operatic courtesan is Violetta Valéry from Verdi’s *La Traviata*. This operatic standard, composed in the 19th century, has a connection to a 20th century American opera heroine, Baby Doe, found in Douglas Moore’s *The Ballad of Baby Doe*. A musical analysis of both *La Traviata* and *The Ballad of Baby Doe* shows that both protagonists share similarities in the harmonic structure. Furthermore, both characters were inspired by historical figures: Marie Duplessis and Elizabeth “Baby” Doe Tabor inspired the characters of Violetta Valéry and Baby Doe. These women have been changed in their operatic portrayals to fit the role of the Romantic courtesan, which is a literary idea of the 19th century that featured a courtesan with redeeming qualities.

Jonathan Steven Conjurske, Katelyn Mackenzie-El Johnston and Alexandra Rae Esser (232)
Faculty Mentor/Collaborator: Christa N. Garvey

Effects of Relative Cane Hardness on Oboe Reeds: A Student-Faculty Collaborative Research Project

Our research project investigates if the relative cane hardness affects the outcome of a finished oboe reed. Oboists rely heavily on the quality of their reeds therefore consistency in reed making is crucial. We explored three questions: Is there a range of acceptable cane hardness that will produce the best-playing oboe reeds? What is the variation of relative cane hardness between large samples of cane? How comparable are the relative cane hardness measurements between batches of cane from different cane suppliers? We hypothesized that the relative cane hardness preferences for each reed maker would vary, but there would likely be a preferred range for each individual. A cane hardness tester was used to find the hardness of 120 pieces of cane. The finished reeds received a self-rated ranking from one to three “stars,” depending on the qualities of each individual reed. These rankings were graphed against the cane hardness measurements. After reviewing our graphs, the results from the project were inconclusive. The outcome of a finished reed appears to depend on a larger group of variables. The project resulted in an article that was published in the International Double Reed Society’s publication, *The Double Reed*, vol. 35, no. 3.

Abigail May Doering (233)
Faculty Mentor/Collaborator: Mitra M. Sadeghpour

Body Image of Opera Singers

For hundreds of years, opera has withstood the tests of time, playing a major role in portraying the ideas and goals of many eras. From the Renaissance and displaying the importance of Greek theatre, to the 21st century with operas like *The Tender Land* showing the heart of Midwestern American culture, opera music and stories have changed along with the goals of people. The opera singer in modern day society has been stereotyped and scrutinized by the public as a fat, bellowing diva, wearing horns and heavy metal armor. Thus, the image of the opera singer has not been as adjustable to the modern century as easily as the stories and musical compositions. Opera is under pressure because of this stereotype. American pop singers are deemed beautiful, as they struggle with anorexia and bulimia to stay thin and “beautiful” among
today’s standards. Should opera singers feel the need to swing with the super thin trend to appeal to biased audience? Finally, because of the weight-conscious performing world of today, how does that stress affect a person physically and mentally? Are performers of today’s society ever comfortable with their bodies?

Britney Nicole Shattuck and Nicole Ashley Korbisch (137)
Faculty Mentor/Collaborator: Mitra M. Sadeghpour
Jean-Baptiste Lully: Facilitating the Use of French Baroque Arias in Undergraduate Voice Study

The research team of two undergraduate performance students and one music faculty member thoroughly explored the operatic output of composer Jean-Baptiste Lully (1632-87) and examined how Lully’s music fits into the development of opera in Europe during the Baroque era. Surprisingly, Lully’s music has remained largely unstudied by undergraduate voice students and this wealth of French Baroque operatic repertoire is not often studied in the United States; this literature has much musical and historical significance and value that warrants our study. The team’s goal was to make this music accessible to undergraduate singers so that French Baroque music could find a similar place in the repertoire to the teaching staples of the Italian Baroque literature. A guide was created with realized scores, explanations and applications of French recitative style, translations of the text, transcription of the text into IPA and “biographies” of the arias which include their context within the operas, their performance history, and their significant Baroque characteristics. This study begins to make it possible for this repertoire to become an option in the standard undergraduate level vocal repertoire.

HEALTH SCIENCES

COMMUNICATION SCIENCES AND DISORDERS

Kayla Noelle Knueppel (225)
Faculty Mentor/Collaborator: Vicki M. Samelson
How will Teaching Phonological Awareness Affect Speech Production in a Preschool Child with a Phonological Disorder?

Children who have multiple speech sound errors (a phonological disorder) often struggle with literacy development, which may be attributed to challenges associated with phonological awareness. Phonological awareness is the ability to listen to and manipulate speech sounds in spoken words, and previous research has shown that it is an early predictor of future literacy skills. I hypothesized that teaching phonological awareness will improve speech production in a child with a phonological disorder. Typically, the more-traditional Hodson cycles approach is used with children who have phonological disorders. Although this approach is very effective in improving speech production, it does not focus on phonological awareness to improve literacy. To test my hypothesis, one child with a phonological disorder received therapy that combined speech production and phonological awareness approaches. Two target sounds were selected for each approach. In the phonological awareness approach, the child listened for the initial sounds in words and differentiated between the two sounds. Two different sounds were targeted using the Hodson cycles approach, with direct speech production practice. Speech production was measured for all 4 target sounds. Final data collection and analysis are in progress. The results of phonological awareness and speech sound production therapy approaches will be discussed.

Lauren Michele Natzke and Autumn Nicole Meyer (224)
Faculty Mentor/Collaborator: Abby L. Hemmerich
ADSD Therapy: Assessing the Effectiveness of Combined-Modality Treatment

Adductor spasmodic dysphonia (ADSD) is a voice disorder affecting muscles of voicing which occurs during speech. This disorder is usually treated with botulinum toxin injections, but some patients have shown prolonged effects of those injections when behavioral techniques are added. Limited data are available evaluating this combination of treatment for ADSD. The current study assessed the effects of a combined-modality treatment on voice-related quality of life for an individual with ADSD. Voice therapy was provided by a graduate student clinician under direct supervision from a licensed speech-language pathologist; behavioral techniques taught during therapy included: increasing breath support, using a forward-focus for the voice, using easy onsets, and decreasing tension. The participant reported that behavioral techniques improved her voice perceptually and decreased the effort required to produce speech. As the effects of the botulinum toxin injection wore off, the patient reported increased effort to speak and less satisfaction with her voice quality. However, she also stated that the behavioral techniques helped her cope with the changes in her voice. Therefore, voice therapy treat-
ment in conjunction with botulinum toxin for adductor spasmodic dysphonia may benefit patients particularly in their ability to cope with voice changes as the effects of the injection wear off.

**KINESIOLOGY**

**Rachel Lucretia Behmer, Madeline Kay Johnson and Kaitlin Klos (164)**  
Faculty Mentor/Collaborator: Robert C. Stow  
*Hip Characteristics Found in NCAA Hockey Players*

Femoroacetabular impingement (FAI) results from an abnormal contact between the femur and the pelvis. Due to this impingement, the individual experiences pathological changes or conditions in the femoral neck, labrum, and/or acetabulum. The literature suggests that playing ice hockey may predispose an athlete to develop these pathological changes. It was our intent to investigate whether NCAA hockey players exhibit certain hip characteristics associated with FAI, such as a positive hip impingement test or discomfort with decreased hip range of motion. A survey was administered to seven NCAA ice hockey programs including two women’s teams and five men’s teams. Participants were asked to give basic demographic information including their personal background in ice hockey and any past or current history of hip pathology. Hip range of motion measurements were performed on each athlete by trained healthcare providers. Any deficiencies or pain with hip flexion or internal rotation were noted as positive clinical findings for FAI (hip flexion <115 degrees; hip internal rotation <30 degrees). Our hypothesis is that ice hockey players in the goalie or defensive positions have an increased presence of clinical signs associated with FAI.

**Alexander John Buechter, Kevin Kristopher Schultz, Anton Eugene Strafus Snyder and Kayla Marie Mansur (197)**  
Faculty Mentor/Collaborator: Mary J. La Rue  
*The Effect of a Short Term Dynamic Core Exercise Program on Agility*

The purpose of this study was to examine the effects of dynamic core training on agility. Previous research primarily focused on the benefits of static core training on sport performance and injury reduction. Little research has been completed to determine the effects of dynamic core training on a stable surface and how it relates to agility, which is a key part of sport performance. In this study, twenty recreationally active, young adults, 8 males (age 20.5 ±0.9 yrs) and 12 females (age 20.3 ±1.1 yrs) completed a 5-week dynamic core training program, 2 times per week for 30 minutes a session. The dynamic core program included high-intensity, explosive type exercises on a stable surface. The program was designed using a combination of traditional and novel exercises involving: medicine balls, plyometric boxes, and resistance bands. The field-based tests used to measure agility pre- and post-program were the running T-test and Hexagon test, which both show high test-retest reliability. To date, pre-test agility assessment has been completed and subjects are undergoing the core training. We hypothesize that there will be a rapid improvement in agility due to the specificity of this training program.

**Mitchell Patrick Cook, Kristin Marie Nelson, John Jordan Taipale and Benjamin James Carlson (106)**  
Faculty Mentor/Collaborator: Jeffrey M. Janot  
*Effects of Two Different Scapular Strengthening Programs in High School Baseball Players*

Scapular dyskinesis occurs in baseball players at all levels, which may result in functional abnormalities and throwing injuries throughout a career. Strengthening the musculature that supports the position of the scapula is necessary for improving longevity in baseball. The purpose of this study was to determine if improvements in shoulder mobility and scapular strength in high school baseball players were facilitated more with a traditional strength training program or a combination of traditional strength training plus resistance band training. Twenty-two high school baseball players (15-18 years) were selected for the traditional and combination training groups. Ten non-baseball playing males (15-17 years) were selected for the control group. During the 6-wk program, the traditional group will complete a resistance program 3 days per week. The combination training group will complete 9 band exercises, 3 times per week in addition to the traditional resistance training program. Measurements of scapular mobility, strength, and functional movement will be taken pre- and post-program. We hypothesize that both traditional and combination training groups will improve scapular mobility, strength, and functional movement significantly over the control group. Moreover, the combination training group will improve more than the traditional strength training group.
Effects of TRX versus Traditional Training Programs on Core Endurance and Muscular Strength

Taylor Lyn Heltne, Jaime Ann Riedl, Heidi Leigh Anderson, Ashley Ann Howard and Chelsea Lyn Welles (107)
Faculty Mentor/Collaborator: Jeffrey M. Janot

Few studies have been conducted evaluating possible benefits and effectiveness of TRX training when compared to traditional resistance training. Therefore, the purpose of this study was to examine the effects of TRX and traditional training on designated variables. Fifty-four younger (19-25 yrs) and middle-aged/older adults (44-64 yrs) were randomized into a TRX (younger n = 15; older n = 8) or traditional (younger n = 14; older n = 7) program within their respective age group. A control group was selected from the younger population (n = 10). Prior to and after completing the 7-wk program the participants were evaluated using the following measures: 5RM strength testing, flexibility, abdominal skin fold, waist circumference, core endurance, and Biodex fall risk balance tests. It is anticipated that TRX training yields greater gains in core endurance, balance, and flexibility with no difference in upper and lower body strength and body composition compared with traditional training. Also, within each population, there will be a relative increase in upper and lower body strength, core endurance, flexibility, and body composition but older adults will achieve greater gains in balance.

A Retrospective Study Correlating Injury History and Dysfunctional Movement

Sydney Lora Kapitany, Kevin Timothy Goldsworthy, Daniel Kaer LaVoy, Patrick Allen Sogla and Kaitlin Klos (165)
Faculty Mentor/Collaborator: Robert C. Stow

The Selective Functional Movement Assessment (SFMA) is a comprehensive movement assessment that can be used to categorize movement patterns. There is research to suggest that SFMA is a more specific analysis of dysfunctional movement patterns, compared to a Functional Movement Screen (FMS). It was our intent to investigate whether dysfunction or pain present during the SFMA Deep Squat test relates to predisposition of specific injuries. Collegiate athlete subjects were instructed to perform an overhead deep squat, followed by predetermined squat variations according to the SFMA breakout flowchart. A video recording was taken of the assessments and each movement was scored based on four possible outcomes (Functional Nonpainful (FN), Functional Painful (FP), Dysfunctional Nonpainful (DN), Dysfunctional Painful (DP)). A questionnaire was given to each athlete containing demographic questions and relative information regarding their injury history. We plan to correlate dysfunctional or painful movement patterns in each major body area with the athlete’s previous injuries. We hypothesize that athletes with a past injury history will present with relative dysfunctional movement patterns during the Overhead Deep Squat Selective Functional Movement Assessment.

Run Time and Perceived Performance Influenced by External Feedback in Endurance Athletes

Research on the impact of encouragement for run training has never been explored. To give insight into coaching methods for practices and competitions, knowing how much to encourage athletes is important. The purpose of this study was to gain insight into which amount of encouragement provides the most influence on running performance during training sessions for endurance runners. Twenty-three participants (8 males, 15 females) age 18-27 years (20.3 ± 1.8) performed two-mile runs on three occasions on an indoor track, separated by a rest period of at least one full day. The three conditions were: no verbal encouragement, minimal verbal encouragement (every 400 m), or maximal verbal encouragement (every 50 m). Maximal encouragement resulted in faster run time (16.39 ± 2.0 minutes) than no encouragement (16.87 ± 2.4) (p < .05). Results for the minimal encouragement trial were not significantly different from maximal or no encouragement. Perceived performance, using a Subjective Exercise Experience Scale, Rating of Perceived Exertion, and an open-ended survey, was not significantly affected by the frequency of feedback. This study suggests that under some circumstances, running performance may improve with higher frequencies of encouragement.

Correlation of Body Composition, Grip Strength, and Core Stability with Balance in Older Adults

Rebecca Lynn Moos, Nicole Kristine Bromelkamp, Kelsey Kay Moore and Lindsay Ruth Hemmrich (166)
Faculty Mentor/Collaborator: Donald L. Bredle

Balance is important to everyday functioning in older adults. The purpose of this study is to determine the correlations between balance and body composition, grip strength, and core stability. 30 subjects (17 males, 13 females) age 55 to 75 years were assessed for body composition, grip strength, core stability, and fall risk via Biodex Balance System. The strongest correlation to balance was observed in the waist-to-hip ratio (r=-.78, n=29, p<.001); this effect was stronger in females than in males. Overall core stability was also associated with better balance (r=-.43, n=28, p=.023). For body
fat percent there was a weak association with balance for females but virtually no association for males. Similarly grip strength had no clear association with balance. The results in this population suggest better balance is associated with lower waist-to-hip ratio (‘pear’ rather than ‘apple’ shape) and higher core strength, but is not associated with higher grip strength and lower body fat. Thus, high core stability and low waist-to-hip ratio should be program focal points when working towards decreasing fall risk in older adults.

Brittany Lee Weiler, Olivia Jayne Augustin, Lyddia Arline Petrofsky and Kathryn Elizabeth Lyman (195)
Faculty Mentor/Collaborator: Donald L. Bredle
Effects of High Intensity Interval Training versus Moderate Continuous Aerobic Exercise on Sedentary College Students

Several recent studies have suggested high-intensity interval training (HIIT) may have advantages over more traditional high-volume moderate-intensity programs. Though greater physical stress could be a drawback, potential advantages include novelty, excitement, and shorter overall time commitment. The aim of this study was to compare these two training protocols and their effects on the following health variables: aerobic capacity, body composition, and power, in sedentary college students ages 18-24. Fifteen subjects were randomized to a HIIT or moderate training group three times per week for five weeks. The HIIT group completed six to eight 50 meter sprints, each followed by 150 meters of active recovery. Moderate training consisted of 30 minutes jogging or walking at 50-60% of their maximum ability. Data is currently being collected. Based on previous research, we are expecting participants in the HIIT group to exhibit greater improvements in aerobic capacity and power, while the groups will see similar improvements in body composition.

Casey Ann Wick, Maggie Elaine Meitzen, Nicole Marie Gutzman and Tiffany Jean Moy (196)
Faculty Mentor/Collaborators: Sue Lynn Myhre and Donald L. Bredle
Effect of Coffee on Caloric Expenditure in Adults during Moderate Exercise

The purpose of this study is to explore caffeinated and decaffeinated coffee consumption on caloric expenditure during an exercise bout. Aerobic endurance has been found to increase with coffee and caffeine ingestion, but the effects on caloric expenditure require further research. Prior studies have generally used coffee as a surrogate for caffeine, thus the physiological effects of coffee alone have not been well-established. Participants will be asked to complete 3 training sessions: 1. Exercise with no coffee (control), 2. Exercise with caffeinated coffee, and 3. Exercise with decaffeinated coffee. The participants will be asked to abstain from coffee and caffeine for 24 hours prior. Caffeine prescription will be based on body weight, calculating 2 mg/kg for each participant. Post-consumption, they will rest for 45 minutes to allow the coffee to digest. After resting, we will equip the participant with metabolic measurement equipment and have them walk at a rate of perceived exertion (RPE) of 5-6, a moderate intensity, for 30 total minutes on a treadmill. We hypothesize that caloric expenditure will be different between the control, caffeinated, and decaffeinated exercise trials.

Chie Natalie Yang (194)
Faculty Mentor/Collaborators: Marquell J. Johnson and Donald L. Bredle
Can Exergaming with the Xbox Kinect Meet Guidelines for Exercise Intensity?

According to the National College Health Risk Behavior Survey, 35% of college students may be overweight or obese due to low levels of physical activity. Exergaming, a new form of exercise, is being promoted as an alternative form of enjoyable exercise to increase physical activity. The purpose of this study is to determine if the Xbox Kinect “Your Shape Fitness Evolved 2012” can produce moderate to vigorous intensity levels (MVPA) according to the American College of Sports Medicine (ACSM) guidelines for physical activity. Fifteen college – aged (18-24 years) healthy sedentary adults participated in the study. The research protocol included a familiarization session with the equipment and a testing session where participants completed two 15 minute sessions of the game with 5 minute breaks between each session. Participants were instructed to mirror the Kinect exercise trainer and play as if he or she were at home. During testing protocol, participant physical activity was measured using a heart rate monitor, an Actical accelerometer at the wrist and hip, and a Cosmed portable metabolic system. To our knowledge no studies have reported the intensity evoked from the Xbox Kinect. We expect that the game will allow participants to meet ACSM’s recommended guidelines for MVPA.
NURSING

Kathryn Lynn Guffy and Sara Peterson (236)
Faculty Mentor/Collaborator: Charlotte K. Sortedahl
What Leadership Concepts and Professional Behaviors are Essential for Nursing Students to Possess?

The Institute of Medicine Report, *The Future of Nursing*, identifies the urgent need to educate nurses at all levels to be leaders (Institute of Medicine, 2010). Nurse educators are challenged to prepare new graduates to work effectively in complex healthcare systems. There is a lack of descriptive research regarding what hospital nurse leaders believe are imperative leadership concepts and professional behaviors essential for new graduate nursing students to possess. The aim of this study is to interview hospital nursing leaders in the Midwest to: 1) Identify the most important leadership concepts and behaviors registered nurses require; and 2) Create a survey that will be distributed to a larger sample of nurse leaders. Seven hospital nurse leaders were interviewed in 30-minute semi-structured interviews. Qualitative content analysis was performed on the audio-taped interviews. Five key themes were revealed. Using these five themes, a 102-item survey was created. This survey will examine what concepts a larger sample of nurse leaders believe is the most valuable. Data collected will inform nurse educators of the essential course content that can be incorporated into the classroom in order to equip students for exceptional leadership.

Brenda Jean Kaczmarski (97)
Faculty Mentor/Collaborator: Mary K. Canales
The Meaning of Food Insecurity in Eau Claire County

This research project seeks to gain an understanding of the meaning of food insecurity from perspectives of parents with young children who have experienced hunger and staff working to improve access to food in Eau Claire County. Food Insecurity was defined as a lack of access, at times, to enough food for an active, healthy life for all household members and limited or uncertain availability of nutritionally adequate foods. This research study is a collaboration between a UWEC nursing faculty member and student and Eau Claire County’s Hunger Prevention Coalition task force to examine food insecurity using focus group methodology. Research efforts included recruitment of parents for seven focus groups and agency staff for one group; collecting and analyzing demographic and focus group data. A total of 43 parents and 8 agency staff participated in the study. The overarching theme, *Juggling Life’s Demands*, reflects the many challenges parents encountered in their efforts to provide food for their families. Further thematic analysis was conducted around the following themes: (1) Why are people hungry?, (2) What does it mean to be hungry?, and (3) What is working? Suggestions? Staff focus group data will be compared with parents’ perceptions and experiences.

Anja Feibel Meerwald and Laurelyn Elise Wieseman (98)
Faculty Mentor/Collaborator: Lee-Ellen C. Kirkhorn
Obesity and Type II Diabetes Mellitus in Chinese Middle-School Students

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

Rachel Ann Philipps, Diane Angelica Sanchez and Clare Luella Sievert (112)
Faculty Mentor/Collaborator: Susan D. Moch
Clinically Applicable Tools for Assessing Dementia in Individuals with Down Syndrome

The importance of finding clinically applicable assessment tools for dementia in individuals with Down syndrome (DS) became apparent after the work of an undergraduate student with community clinicians on evidence-based practice.
initiatives. Screening tools used in the neurotypical population are inappropriate in the DS population due to the variation of cognitive abilities. Most individuals with DS present with Alzheimer’s neuropathology over age 45, but many are undiagnosed. As nurses, our role is to advocate for this population and educate caregivers on the signs and symptoms of developing dementia. Reliability, validity, and efficiency of each tool were summarized for this review. Articles assessing dementia in DS were found using the following search terms: dementia, Down’s syndrome, assessment tools, and instruments. Of the many instruments found, few clinically relevant tools had good reliability and validity. While not one tool has shown complete effectiveness for assessing dementia in DS, recommendations exist. One recommendation is establishing a baseline prior to cognitive decline with reassessments done every two years and annually after the age of 50. The assessment chosen must be used longitudinally and involve the individual and caregiver. Future research should focus on developing a gold standard in assessing dementia in individuals with DS.

Stephanie Marie Sjostrom and Michelle Marjorie Markwardt (127)
Faculty Mentor/Collaborator: Shelley-Rae Pehler

Longing: A Concept Analysis

Longing is part of an emotional experience that is manifested within the depths of someone’s being, occurring when an individual or family experiences loss, through illness or changes within their lives. Although longing in patients and families has been found in the nursing literature, it is poorly defined and difficult to assess for in patients and families. In nursing, when a patient phenomenon is not well understood, research is conducted to further explain and define this phenomenon. A research project using Rogers (2000) Evolutionary View of Concept Analysis was undertaken to identify key attributes of longing in order to form a nursing diagnosis which would allow better assessment of longing in individuals and families. A representative sample of articles was reviewed from the disciplines of nursing, psychology, medicine, and religion. The databases of CINAHL, PsychINFO, JSTOR, ALTA, and PubMed were searched using the key words of “longing,” “family,” and “illness.” Preliminary data synthesis has revealed key attributes of longing in individuals and families who are experiencing loss across multiple settings and countries. These attributes will be the foundation to build a definition of longing. The data is currently being analyzed, and results will be shared at the Celebration of Research and Creative Activity.

Naomi Rae Vogt (128)
Faculty Mentor/Collaborator: Lisa F. Schiller

A Look to the Future of Nursing from the Perspective of the Past: A Qualitative Study of Retired Nurses on the Institute of Medicine (IOM) Future of Nursing

The purpose of this research project was to explore retired nurses’ perspectives related to two key messages in the Robert Wood Johnson Foundation and Institute of Medicine report “The Future of Nursing: Leading Change, Advancing Health.” The research focused on participants’ experience with education in nursing and collaboration with health care professionals. Understanding the experience of nurses who have lived through change will better enable nursing to understand the barriers, opportunities, and strategies to advance the nursing profession as a primary force in shaping the future of nursing, and health care in our nation. Ten retired nurses ages sixty years and older were gathered through purposive convenience sampling. Interviews were audiotaped and field notes were taken. Interviews were qualitatively analyzed using long table method and categorized according to themes. Participants expressed a variety of perceptions related to level of educational attainment and provision of quality of care among nurses which will be qualitatively analyzed and presented. Overall, participants described a great improvement throughout their careers in collaborative relationships with other health care providers. Suggestions for improvement in collaboration as well as education will be qualitatively analyzed and presented.

NURSING AND SOCIAL WORK

Justin William Mabin, Sarah Jean Younger and Timothy Ryan Shaw (113)
Faculty Mentor/Collaborators: Susan D. Moch and Lisa Quinn-Lee

Oxygen Use at the End of Life: Attitudes and Beliefs Surveys

The purpose of this study is to understand the use of oxygen at the end of life. Palliative oxygen therapy for the management of breathlessness remains controversial and little research is available in regards to the practice of using oxygen at end-of-life. Despite the difficulty with research in this area, many questions remain, and there is a need to expand the data and awareness in this field. A survey was created and sent to 42 palliative care directors/coordinates around Wisconsin. The survey gives insight into the policies for oxygen use at the end-of-life, why these protocols are in place, how oxygen
use affects the timeline of dying, what other practices are used to increase respiratory relief at the end of life, and attitudes and beliefs of practitioners and family members around oxygen use at the end of life. A mixed methods approach was used for this study. Quantitative and qualitative data were gathered by asking various questions about participants’ experiences and observations. The data is still being analyzed, but with the results we expect to have an increased understanding of the use of oxygen at the end of life.

**WATERSHED INSTITUTE**

**Jeron David Jacobson, Kimberly Erin Shermo** and **Zachary Patrick Kroening (217)**

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

*Measurement of Airborne Particulates Around Sand Mines and Processing Plants*

The intent of the research was to further investigate if there is a positive relationship of frac sand mining and exposure to air-borne silica particulates. Wisconsin has seen a drastic rise of the frac sand mining industry, which causes concern for public health with respect to air pollution and land alteration. These are some of the issues that we, as Environmental Public Health majors, strive to gain more knowledge about and act accordingly. To gather the data, we took one to two minute ‘snapshot’ samples of particulate concentrations in the air near these mining and processing facilities using a portable electronic device. Data was collected around active and inactive sites to compare results. Though still in progress, our data show the positive relationship we predicted regarding exposures to particulates near the mining and processing facilities. The higher levels indicate that this is a true public health concern which may need further research to draw conclusions.

**Rachael Ann Korinek, Allison Kate Malecek, Kristen Ann Walters, Johnathan Wayde Boettcher, Jonathan Michael Jilek, Lindsey Nicole Mittendorf and Jared Michael Ryan (84)**

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

*Metals in Hair as Predictors of Disease*

Our collaborative project aims to determine how increased levels of heavy metals in the body contribute to overall health. We are collaborating with the University of Eastern Finland - Kuopio and building upon the work of the Kuopio Ischemic Heart Disease (KIHD) study. Using Inductively Coupled Plasma Mass Spectrometry (ICP-MS) we measured concentrations of heavy metals in 67 hair samples collected in 1985-86 in Finland during baseline testing in the KIHD study. To determine health outcomes, we are utilizing the biological data gathered in the KIHD study during the 20 years of follow up. Using statistical analysis, we are currently analyzing the biological data collected in Finland and comparing it against the measured levels of metals in hair. We are analyzing the measured levels of heavy metals such as arsenic, lead, and others, as potential retrospective predictors of disease. Our team of students looks forward to presenting a variety of significant relationships between metal levels in hair and disease risk. Our goal is ultimately to increase understanding as to how increased heavy metal load in the body contributes to disease risk or decreased functioning in a wide range of body systems.

**HUMANITIES**

**COLLEGE OF ARTS AND SCIENCES**

**Michael Graham Jacobs, Alex William Tronson** and **Tyler Michael Tronson (270)**

Faculty Mentor/Collaborator: **Marc R. Goulet**

*The Creative Process: Short Documentary Films*

The purpose of this project is to produce a short documentary film exploring the role of the *Creative Process* through a diverse array of disciplinary perspectives and educational activities at UW-Eau Claire. From the arts to the sciences, and many places in between, we will explore the connections and interactions that define a liberal arts university. By exploring the similarities and differences between how different people do their work, we will be able to not only broaden our audiences’ notion of what *creativity* can mean – but also deepen their appreciation for the important role of universities in fostering a free and productive society. As we continue to create a series of short films about different people and perspectives around Eau Claire, we are establishing a formula and style of exploring the creative process through film. This project proposes that the best way to demystify common notions of creativity, interdisciplinary research, and liberal education is to create a common ground where we can identify our own *Creative Processes* in each other’s work. We achieve our goal when a viewer identifies something of their own experience in the testimony of the people we interview.
Our goal was to redevelop aspects of the Blugold Seminar course including working with ELL and basic writers, assessment, digital literacy and information literacy. Three of the researchers involved are currently English Education majors and this project offered them experience in curriculum development. The other two researchers were recent students of the Seminar and provided anecdotal experience and input in order to better the Seminar. Each of the five researchers spearheaded a different component of the Seminar and gathered information and research from scholarly texts before reconvening and sharing with each other and two English department faculty members to determine the best ways to implement new strategies in the Seminar. Student researchers developed handouts in each of their areas for faculty teaching the course. Due to the preliminary nature of the research, the Blugold Seminar is still in development despite the changes implemented from the student researchers’ input.

Gregory James Martin (80)
Faculty Mentor/Collaborator: Jan C. Stirm

Pronominal Power Play in Thomas Middleton’s The Witch

Power play is a central theme in the Early Modern English play The Witch, written by Thomas Middleton, and can be easily seen during a surface reading of the play. However, a deeper level of understanding can be obtained by comparing the implementation of the two second-person pronouns that were in use during the period: thou and you. The discussion in this paper tackles this scholarly ignored play using an uncommon method, with the actual words of the play being used to explore a deeper meaning that is lost to a modern audience who do not utilize the two different pronouns. In order to do so, the play is dissected and each instance of the second person pronoun is observed, with great attention being given to instances where pronoun usage changes between interacting characters. The end result gives a slightly altered reading of the play, exploring relationships between characters that at surface might seem to be at equal standing, but truly aren’t.

Michael Sean Seitz (101)
Faculty Mentor/Collaborator: Jan C. Stirm

Firestone’s Role in The Witch: More than Just a Clown

My essay focuses on the character Firestone, from Thomas Middleton’s The Witch, and argues that he is more than a minor character whose role is the clown. Minor characters in early modern plays were often very important and complex, even if they appeared once or twice. I used Playing Bit Parts in Shakespeare, by Molly Mahood, to learn more about roles small characters serve, when looking at the sections of the play that included Firestone. The Witch is an early modern play that hasn’t been looked at by many, so examining Firestone was new and interesting. Besides examining his roles, I look at his name and compare this to other characters that were named Fire before the time that Middleton wrote The Witch. He works as the clown, but with a closer inspection, he plays many roles, such as creating a foil for larger parts and bringing actions that occur off stage to the audience. I conclude that Firestone is a very multi-dimensional character who serves multiple roles in Middleton’s play.

Hlee Yang (176)
Faculty Mentor/Collaborators: Shevaun E. Watson and Carmen K. Manning

The Blugold Seminar and Transfer of Writing Skills Across Disciplines

This research aims to understand the effects of the new first-year writing curriculum, the Blugold Seminar in Critical Reading and Writing, on students’ learning and writing. We are particularly interested in understanding the nature and depth of writing transfer as a result of the new course. Writing transfer refers to the knowledge, skills and insights that are carried from the first-year writing course to the varied writing tasks and situations that students face across the disciplines. This year’s data was collected from a cohort of students from the first year of the Blugold Seminar (2012-2012). Through a series of semi-structured interviews, we asked 20 students—10 who took the traditional version of English 110 and 10 who took the Blugold Seminar 110—about their experiences in these classes, as well as how knowledge and skills gained in those courses have or have not transferred over to writing demands in college as a whole. After transcribing and coding these interviews for things such as, negative/positive comments about the course, contradictions in their statements, types
of information learned throughout the course, and more, we hope to come to a better understanding of what can be done to create a curriculum that is more meaningful and beneficial to the overall academic and personal achievements of these students.

**HISTORY**

**Lindsey Marie Rindo (274)**  
Faculty Mentor/Collaborator: **Louisa C. Rice**  
*Imagining the Future(s): Interpretations of the Egyptian Revolution*

This research project aims to provide an analysis of the recent Egyptian Revolution. The focus of this research centers on how Egyptian citizens interpret the current revolution, thoughts on democracy and hopes for the future of Egypt. Rather than taking a global or strictly political approach in the analysis of this revolution, this project focuses on the people’s perspective, motivation and ultimately the aftermath, or project aftermath. The project will also use past Egypt revolutions to provide historical background for this revolution and give light to what this revolution means for the people of Egypt. Ten transcribed oral histories will be used in understanding how the Egyptians feel their history as a nation and people, religious identity and gender roles has affected political change within Egypt. This social history uses both recent and past events to understand if each of these revolutions are considered nationalist movements in the eyes of current Egyptian people. Religious identities will be discussed at length in connection to this movement’s motive in strictly Egypt as well as the “Arab Spring” on a global scale. As a social history, we aim to examine these past events from various vantage points in all realms of society.

**HONORS**

**Braden Joseph Krien (134)**  
Faculty Mentor/Collaborator: **Jefford B. Vahlbusch**  
*The Roles of Virgil in Dante’s Divine Comedy: An Investigation in Primary and Secondary Literatures*

Dante Alighieri’s poem, *The Divine Comedy*, holds an indisputable place in the highest echelons of world literature. One of the central characters in the first two parts of this travelogue is Virgil, Dante’s guide and poetic predecessor. Much has been said about Virgil. This research project critically examines the role of Virgil through a semester-long survey of scholarship on *The Divine Comedy* in English. Through an examination of Virgil in classic and more recent scholarship, and in *The Divine Comedy* itself, this project will illuminate the role of Virgil as guide, teacher, theologian, protector, as well as one of the creators of the poetic tradition that Dante-poet inherits.

**LIBRARY**

**Jennifer Marie Barth (273)**  
Faculty Mentor/Collaborator: **Gregory John Kocken**  
*Picturing the Past: The University of Wisconsin-Eau Claire, 1916-2016*

Harvey A. Schofield was the president of the Eau Claire State Teachers’ College (now the University of Wisconsin-Eau Claire) during the Great Depression. At a time when higher education across the country was suffering from lack of funding and legislative support, Schofield—using his administrative abilities and famously forceful personality—ensured that his always somewhat embattled college thrived and served students as best it could during the economic crisis of the 1930’s. This included pushing back against the dominating force of the University of Wisconsin, inviting scholars and speakers from a broad spectrum of fields to appear at assemblies, and paying for a number of things at the college out of his own reduced salary. As the first and longest-standing president (now chancellor), Schofield’s role in the University’s history cannot be overstated. The aim of this research is to commemorate his memory and celebrate his achievements in helping to make the University what it is today, in light of the upcoming centennial.
MUSIC AND THEATRE ARTS

Colin Carey (135)
Faculty Mentor/Collaborator: Ryan P. Jones
Reggatta de Blanc (White Reggae) & the Commercial Rock Industry: Intersections of Race, Culture, and Appropriation in Bob Marley and the Police, 1977–1983

This project examines and questions one of many important and prominent stylistic cross-pollinations in popular music—the influence of Jamaican reggae upon mainstream rock composition, performance, marketing, and, ultimately, financial success. At its core, the significance of this investigation considers the implications behind cultural and racial appropriation itself—in this case, the borrowing or adaptation of a Third World musical style by a Western music industry and the extent to which that borrowing refashions the original source material (or its original aims) to suit its own agenda. The connection between reggae and mainstream rock was perhaps no more evident or lucrative than within the musical career trajectory of the wildly popular new wave group, the Police (1977–1983), comprised of lead singer/songwriter Sting (Gordon Sumner), guitarist Andy Summers, and drummer Stewart Copeland. While a variety of factors were certainly in play during their rise, the inceptive role of the band’s unique music sound—based in large part on a clear exploration of and debt to reggae style and rhythms as directly referenced by the title of their second album, Reggatta de Blanc (1979), loosely translated as “White Reggae”—undeniably lay the foundation for their dominant appeal and its profitable outcome.

PHILOSOPHY AND RELIGIOUS STUDIES

Carey Rae Hoeff (143)
Faculty Mentor/Collaborator: Jennifer A. Bushnell
Purification Within Islam

The question this study attempts to answer is: In what ways does Islam use the body to express religious ideas of purity; and why does this matter? There has been very little research done on this topic. This research contributes to the topic of how religion deals with the body. Qualitative field research in the forms of observation and individual interviews were used in this study. Numerous books and articles were also referred to during the research process. This research expects to uncover that Islam deals with the body in a variety of forms which depend on historical, cultural, and religious context.

Douglas Loren Schwoch (231)
Faculty Mentor/Collaborator: Kristin P. Schaupp
Ethics and Oil: Are We Sacrificing the Sea for the Shore?

Should the use of Corexit dispersant during oil spill remediation be within a corporate ethics framework? The use of Corexit at sea has become the standard tool in oil spill clean-up. Although the EPA has approved the use of Corexit, research is starting to show that it may not be as harmless as previously thought. In fact, there are indications that Corexit mixed with oil disrupts the very base of the oceanic food chain, something which could have a profound effect on the survival of multiple species. This project focused on the use of Corexit in response to the Exxon Valdez and the BP Deep Water Horizon disasters. After examining ExxonMobil’s and BP’s codes of ethics, I discovered that both codes took an anthropocentric approach, which prevented them from considering all stakeholders. This allowed them to justify their actions, but prevented them from erring on the side of caution. I employed the results of recent research on Corexit’s toxicity to sea life to argue that federal testing standards are not strict enough to protect the environment. I recommend that we as a society should redefine our commitment to the environment by taking a non-anthropocentric approach to environmental questions.

WATERSHED INSTITUTE

Jennifer Marie Barth (272)
Faculty Mentor/Collaborator: David Soll
The Winning Personality: President Harvey Schofield, the Eau Claire State Teachers’ College, and the Great Depression

Harvey A. Schofield was the president of the Eau Claire State Teachers’ College (now the University of Wisconsin-Eau Claire) during the Great Depression. At a time when higher education across the country was suffering from lack of funding and legislative support, Schofield—using his administrative abilities and famously forceful personality—ensured
that his always somewhat embattled college thrived and served students as best it could during the economic crisis of the 
1930’s. This included pushing back against the dominating force of the University of Wisconsin, inviting scholars and 
speakers from a broad spectrum of fields to appear at assemblies, and paying for a number of things at the college out of 
his own reduced salary. As the first and longest-standing president (now chancellor), Schofield’s role in the University’s 
history cannot be overstated. The aim of this research is to commemorate his memory and celebrate his achievements in 
helping to make the University what it is today, in light of the upcoming centennial.

Stephen Louis Petrie (271)
Faculty Mentor/Collaborator: David Soll
The Lac Courte Oreilles Chippewa vs. the Northern States Power Company

This research investigates a legal dispute between the Lac Courte Oreilles Band of Lake Superior Chippewa Indians and 
the Northern States Power Company about a dam that was licensed by the Federal Power Commission in 1921 to be built 
on reservation land despite the firm objections by the Tribe. Since the license had a life span of 50 years, the Band filed a 
petition in 1971 to block the relicensing procedure and lengthy court proceedings ensued for over a decade. The central 
driving questions of this project are the environmental consequences to the reservation resulting from the constriction of 
this dam as well as how these consequences were addressed during the relicensing proceedings. The research is being 
conducted based on primary source materials from the Larry Leventhal Papers at the University of Wisconsin Eau Claire 
Archives. Leventhal was the primary attorney for the Band during the proceedings and his collection includes numerous 
letters, witness testimonies, hearing briefs, documents pertaining to the case, and various other forms of primary sources. 
In terms of larger context, the case reveals the dramatic shifts in ecological consciousness that occurred between the 1920s 
and 1970s.

MATH AND COMPUTER SCIENCE

ART AND DESIGN

Derek Dale Hestekin and Stephen Thorsell (259)
Faculty Mentor/Collaborators: Sooyun Im and Michael G. McMann
Locative Media App: myCAPSULE

The purpose of this research was to explore how individuals experience locative media through technology (tablet com-
puters and cellular phones) in regard to physical space, virtual space, and location-aware surveillance. Due to the in-
creased sophistication of mobile technology and newfound popularity of locative media, it was the group’s goal to create 
an interesting mobile app that was technologically functional with a user-friendly interface design. Through informal 
interviews with mobile app users and researching existing technologies and interface designs used in locative media apps, 
the group decided to create a location-aware app that served as a virtual time capsule, entitled myCAPSULE. In using 
myCAPSULE, users will be able to technologically record an experience through geographically tagging photos, videos, or 
memos to a physical location through locative media. The project is currently in the prototyping stage, with the technical 
programmer and graphic designer working symbiotically to create a technologically complex mobile app that is easy to 
use for a consumer. Once myCAPSULE is created, the group is eager to discover how users record or retrieve experiences 
in virtual space while continuing to interact within physical locations.

COMPUTER SCIENCE

Adam Yakub Al-Ibrahim and James Felton (285)
Faculty Mentor/Collaborators: Christopher R Johnson and Peter J. Bui
Buster: A Budget Minded Cluster for Distributed Graphical Visualizations

Traditionally, high performance computing comes with a high price tag. This project disrupts that idea by creating a com-
puter cluster with minimal financial investment thereby increasing the accessibility of such high performance computing 
environments. To achieve the goal of a budget-minded cluster we combined multiple Raspberry Pi computers to create a 
cluster that mimics a traditional distributed system. This was accomplished by networking each Raspberry Pi and utilizing 
software libraries such as OpenMPI, OpenCV, and OpenGL ES to develop distributed applications that demonstrate the 
capabilities of our system. Although the project is still in progress several conclusions can be made. First, the performance 
of our system pales in comparison to that of an enterprise cluster computing system. Despite this, however, the system can 
be used as an educational tool to teach students how to develop software for distributed systems. Second, it can be utilized
to render graphical visualizations across multiple computer screens. For our poster, we will demonstrate two such distributed graphical applications: a video display wall and a networked video game.

Travis Alan Boettcher (283)
Faculty Mentor/Collaborator: Peter J. Bui
*Using Distributed Computing to Decrease Render Times*

In this project, two programs, WorkQueue and Blender, are used together to produce faster render times for computer-animated movies. The goal of the project is to make it possible for art students to produce longer, more detailed movies. Besides writing the code for the system, various tests – including stress testing and performance testing – are used to determine the efficiency of the system. Highlighted in the poster presentation will be the technology used – distributed computing – and the outcome of several tests.

Nicholas Alan Goble and Cameron Paul Bjorklund (281)
Faculty Mentor/Collaborator: Peter J. Bui
*Media Server Portal*

The goal of our project is to develop a system to access files such as music, video, and so forth, from the web without having to be on the computer where they are stored. The main reason for the project is that people today have large collections of media files across multiple computers, and would like to be able to access all of these files in a streamlined and convenient manner on multiple types of devices. Our project aims to accomplish this by implementing an easy-to-use web service that serves as a portal to a distributed collection of multimedia file servers. Although this project is currently under construction, we have a rudimentary prototype that demonstrates the ability to convert and stream music and video files on-demand to multiple devices via the Internet. At the end of our project, we plan to have a web service that supports playlists, searching, and tagging in addition to the on-the-fly media conversion and streaming capabilities we have already implemented.

Nicholas Hans Jaeger (280)
Faculty Mentor/Collaborator: Peter J. Bui
*A Music Filled Flask: Real Time Distributed Transcoding*

As video sharing sites grow with overwhelming popularity, it becomes more and more common to stream videos to cell phones and other devices that rely on cellular data connections. Unfortunately, streaming videos in order to listen to music or lectures unnecessarily uses a large amount of mobile bandwidth. To minimize the costs of streaming videos to mobile devices, we developed a web service that converts a user-specified playlist of video streams into an audio stream. We evaluate the implementation of the system and focus on the mobile bandwidth savings. Compared to streaming videos, we expect our web service to utilize much less bandwidth.

Jeffrey Michael Westphal (284)
Faculty Mentor/Collaborator: Peter J. Bui
*Scalable Distributed Image Transcoding using Python-WorkQueue*

Transcoding large amounts of digital media from one format to another is a common data intensive task. Because this is a slow process, we devised a scalable image transcoding system based on Python-WorkQueue that significantly reduces the amount of time required to convert images from one format to another by mapping transcoding tasks across a distributed pool of remote workers. We test our system using a Condor cluster and varying amounts of files and number of workers. Our results show that we are able to achieve speed increases up until a certain limit.

Mitchell Douglas Wood, Taren Jerald Leitzke and Conor James Sherman (282)
Faculty Mentor/Collaborator: Daniel E. Stevenson
*Analyzing JPEG Images*

There are many pictures in today’s world which have been altered. Some pictures have the possibility of causing damage. Thus, it would be helpful if there were a free, open source program on the web that could tell you how likely an image was modified. We started by developing a program in Java that takes in a JPEG image and outputs its quantization tables. These tables of numbers are what help a camera to determine optimal settings for a photograph. We use these numbers to calculate the quality of the current image. Since the JPEG format is lossy, the lower the quality calculated, the safer it is...
for us to assume the image has been modified. We can extract metadata from the image which contains clues as to what program was used to save the image. We can also calculate the difference in pixel loss between two different quality saves of the same image which makes it easy to identify any modifications. In conclusion, we have discovered that for JPEG files, we can detect whether or not they have been modified.

**MATHEMATICS**

Andrew Robert Boyd (25)
Faculty Mentor/Collaborator: Abra Brisbin
*Comparison of Methods of Association Mapping in Latinos*

Individuals who have ancestry deriving from three or more populations, such as Latinos, bring new challenges and opportunities for identifying genes associated with diseases. In this poster we will compare various methods that were used on African Americans, who have ancestry from two populations, when they are used to predict gene associations with Latinos, who typically have ancestry from three populations. In this case, we will explore different methods for accurately detecting associations between phenotypes, genotypes, and the ancestry in a small region of DNA around the genetic variants in question. We have tested three methods: one model with genotype only, one model that uses the local ancestry, and one model that uses the average ancestry. With all three of the methods, we have found the greatest power to detect associations at genetic variants where each allele had frequency between 45 and 55%. So far, the method using genotype and average ancestry on the chromosome has the highest power.

Meghan Marie Christenson and Leah Elizabeth Grancorvitz (85)
Faculty Mentor/Collaborator: Dandrielle C. Lewis
*Sonia Kovalevsky High School Mathematics Day*

The Sonia Kovalevsky High School Mathematics Day is a project that aims to expose high school young women to opportunities available in math and science by creating fun and exciting experiences through workshops, plenary talks, panel discussions, and a math competition. For this project we developed two exciting interactive workshops that use manipulatives to introduce and expand the math concepts of geometry, probability, statistics, algebra, trigonometry, and calculus. We created a geo-caching activity where the girls used I-pads to solve math challenges and to navigate through their respective routes, and we created challenges for a math competition. All the activities developed were created to actively engage the young women and excite them to continue their studies in math and science.

Nolan Kriener (36)
Faculty Mentor/Collaborator: Alexander J. Smith
*Testing Benford’s Law With Mathematical Data*

In the physical world, one can gather a large sample of naturally occurring numbers such as lengths of rivers or heights of trees. When observing the leading digits of these numbers, a pattern occurs. This pattern is referred to as Benford’s Law. Our research poses the question as to whether or not this pattern holds true for numbers occurring in the mathematical world. We used the mathematical software package Mathematica to analyze various mathematical sequences archived in the Online Encyclopedia of Integer Sequences. We generated many terms of the different sequences, observed the leading digits, and compared their distribution to the Benford Distribution. We found that most of the sequences do not follow the Benford Distribution, however the ones that do are quite surprising.

Alexander Stanley Lasiuk and Zachary David Kelliher (86)
Faculty Mentor/Collaborator: Abra Brisbin
*Detecting Associations Between Rare Genetic Variants and Quantitative Traits*

Identifying genetic regions that are associated with diseases and other complex traits is important for understanding the causes of those traits. However, many existing methods do not work well when a particular region contains single nucleotide polymorphisms that put the person at risk, in addition to polymorphisms that protect them from a certain quantitative phenotype. To fix this, we are looking at the covariance between the genotypes of individuals at a particular single nucleotide variant, and a vector containing information on each individual’s phenotype, or trait value. Then we sum up the square, or absolute value of all those values to conclude if that set of single nucleotide variants is associated with the individual’s quantitative phenotype. We have run this on simulated quantitative data, and returned p values similar to SKAT, a competing method. We will also present the results of our method on real DNA sequences of individuals experiencing
chemotherapy-induced peripheral neuropathy.

Kathryn Elizabeth Litzau (56)
Faculty Mentor/Collaborator: Carolyn A. Otto

The Genus of Tangle Closures

In this project we developed an understanding of rational tangles and their relationship to genus. The numerator closure and the denominator closure of these tangles are the focus of this project. When a closure operation is performed on a tangle, a knot or link is obtained. Using Seifert’s Algorithm we determine an upper bound for the genus. We studied tangles with 1 twist component, 2 twist components, and 3 twist components. All of these closures genuses are now known.

Andrew James Meinel, Michael Charles Loper, Minesh Sivaperumal, and Andrew Robert Boyd (6)
Faculty Mentor/Collaborator: Michael R. Penkava

The Moduli Space of Non-Nilpotent Complex 4|1-dimensional Associative Algebras

Our research shifts the perspective of algebras (such as polynomial algebras, the integers, and the rational, real, and complex numbers) as sets of rules to thinking of them as objects in a certain space. This shift in perspective changes the type of questions we can ask about them. The new point of view is that an associative algebra is a codifferential (which is a special type of coderivation). Two algebras are isomorphic if their codifferentials are equivalent. The set of equivalence classes of codifferentials on a fixed vector space $V$ is the moduli space of algebra structures on $V$. We can also study curves in this moduli space, which are families of algebras. We have recently constructed the moduli space of 1|4-dimensional non nilpotent complex associative algebras, which contains 506 types of algebras. Currently, we are in the process of studying all the deformations of these algebras, which determines how the moduli space is glued together from the algebras. The method of construction relies on the fact that any finite dimensional non nilpotent complex associative algebra is either semisimple or is an extension of a semisimple algebra by a nilpotent algebra of smaller dimension.

Daniel Christopher Schilcher (66)
Faculty Mentor/Collaborator: Dandrielle C. Lewis

$D_8 \times D_8$ and its Subgroup Lattice

Let $A$ and $B$ be finite groups and consider the direct product $A \times B$. What can we say about the subgroups of $A \times B$? In 1889, Edouard Goursat proved a theorem stating that there is a bijection between the set of subgroups of a direct product, $A \times B$, and the set of all isomorphisms between a factor group of $A$ and a factor group of $B$. We used a recently developed containment theorem to create the subgroup lattice of the direct product of the dihedral group of order 8, $D_8$, with itself, $D_8 \times D_8$. One of our long term goals was to provide the subgroup lattice of one of the extraspecial groups of order 32. Although we already know what the subgroup lattice is going to be from a construction of the subgroup lattice of $Q \times Q$, where $Q$ is the quaternion group, this construction is interesting because the subgroup structure of $D_8 \times D_8$ is very different. Specially, $Q \times Q$ contains 133 subgroups whereas $D_8 \times D_8$ contains 389 subgroups. We have determined the containment of all of the subgroups of $D_8 \times D_8$, used Geometer’s Sketch Pad to create its subgroup lattice, and provided the subgroup lattice of the extraspecial group of order 32 that lies inside of $D_8 \times D_8$.

MATHEMATICS AND COMPUTER SCIENCE

Kathryn Elizabeth Litzau and Matthew Nicholas Wisby (55)
Faculty Mentor/Collaborator: Chris R. Ahrendt

Small-Scale Weather Patterns Modeled with Cellular Automata

In this work, we develop a cellular automaton to model small-scale weather patterns. Modeled after PDEs for advection and discretizing these PDEs that model typical Wisconsin weather, we develop formulas used to create the rules of the cellular automata and construct a program to model weather movement. Advection is the transfer or spreading of heat in a given area. Warm pockets of air surrounded by cooler air will eventually diffuse out so all of the air has the same temperature. A cellular automaton is a discrete model that changes over time steps by sets of rules that govern the cells. Each cell has a finite number of states it can be in. The state of a cell is changed after each time step only by its 8 surrounding cells. The underlying set of rules take into account information about typical components of weather, such as moisture, rain, wind, temperature, and topography. At the heart of the model are several different automata, which represent each component. We also explore rotation within the wind automaton using Green’s Theorem and its representation of curl. These different cellular automata interact with each other in a way that models weather patterns. Cary James Schneider and
Wai Shan Chan (5)
Faculty Mentor/Collaborator: Colleen M. Duffy
Algebra Associated to the Hasse Graph of Polytopes

The primary goal of our project is to determine the structure of a graded algebra, A(Gamma), that is associated to the Hasse Graph, Gamma, of a polytope. We first considered the n-dimensional hypercube. For each symmetry, we consider the graph representing the k-faces which are fixed under that symmetry. From each of these graphs, we determine a function that tells us the graded dimension of subalgebras of A(Gamma) by counting the directed paths between each pair of levels in the graph; together, these tell us the structure of the algebra. We were able to determine the function that describes the algebra that is only dependent upon the symmetry. Currently, we are extending our methods to the half-cube, which is composed of tetrahedrons and cubes. By extending our results, we hope to gain a better understanding of the algebras associated to polytopes.

Alexa Ray Syryczuk (26)
Faculty Mentor/Collaborator: Ursula A. Whitcher
Constructing 4-Dimensional Tops

The polar duality transformation takes a polytope with integer lattice points to its polar dual. If the polar dual is also a lattice polytope then we refer to the polytopes as reflexive polytopes. Reflexive polytopes have been classified in 3 dimensions and 4 dimensions, with 4,319 and 473,800,776 classes respectively. A lattice polytope that contains the origin is known as a top. Bouchard and Skarke have classified the 3 dimensional tops corresponding to each class of reflexive 2-dimensional base polytopes. We use triangulations of 3-dimensional reflexive polytopes to construct new, “exceptional” examples of tops. We have specifically analyzed the octahedron and simplex.

MATHEMATICS AND PHYSICS AND ASTRONOMY

Kaisey Jo Garrigan, Hitham Sami Abu Eid and Adam David Germain (35)
Faculty Mentor/Collaborators: Alexander J. Smith and Paul Jonathan Thomas
Tonal Dissonance Curves

Our research utilized Fourier Analysis techniques and software MATLAB and FAWAVE to adapt the work of Dr. William A. Sethares on Tonal Dissonance Curves to the human voice. Dr. Sethares’ research analyses the relationship between sensory dissonance for two tones, and their frequency intervals with musical instruments. We compare Dr. Sethares’ work with our own data using voice as the instrument. We test the hypothesis that perceived total dissonance of musical instruments is derived from, and therefore similar to, dissonance in the human singing voice. We numerically computed the maximum amplitudes and graphed them compared to the corresponding harmonic frequencies. This research is a project of the University of Wisconsin-Eau Claire’s Computational Science II class.

BIOLOGY

Kristine Marie Albin and Morgan Marie Laffey (93)
Faculty Mentor/Collaborator: David Lonzarich
Histology of Alarm Substance Cells in Relation to Parasite Load and Fish Size for Hornyhead Chub (Nocomis biguttatus)

Alarm substance cells (ASC) found in the epidermis of many freshwater fish species, upon rupture by predators, release chemicals which have generally been thought to alert nearby prey. Competing hypotheses propose a function of these cells in the immune system, prompting this study using wild, preserved specimens of the hornyhead chub (Nocomis biguttatus) affected with a parasite (Neascus pyriformes). Our previous work has shown that in the predatory minnow, creek chub, individual variability in ASC densities is associated with size, mucous cell density, epidermal thickness, and black spot parasite load. This study attempts to assess these relationships in the non-piscivorous minnow, hornyhead chub. Histology preparation of epidermal tissue from 100 fish has been conducted over the course of two years, and initial data analyzed using bivariate analysis has suggested a relationship between fish size and ASC density.
Lydia J. Alf (2)  
Faculty Mentor/Collaborator: Winnifred M. Bryant  
**Determining the Effect of Triclosan on the Growth of Cancer Cells**

The proliferative effects of antimicrobial compound triclosan were characterized in two cancer cell lines. MCF-7 cells are an immortalized breast carcinoma cell line that expresses endogenous estrogen receptor. Ishikawa cells are a cancer cell line derived from the endometrium and they express endogenous estrogen receptor as well. We hypothesized that challenging these cells with triclosan, which is estrogenic, would stimulate cell proliferation. Dose response studies showed that treatment with triclosan decreased cellular growth in both cell lines. Expression of estrogen receptor protein was increased in cells treated with triclosan. These results do not suggest that triclosan is an effective cancer “treatment” but may reflect discrepant patterns of dose and timing regarding exposure to environmental estrogens.

Jeffrey Jon Bauer, Nicholas Ryan Salinas, and Brenna Lee Conway (94)  
Faculty Mentor/Collaborator: David Lonzarich  
**Early Life Survivorship of Coho Salmon (Oncorhynchus kisutch) in a Small Lake Superior Tributary**

Coho Salmon were introduced into the Lake Superior basin in the late 1960s and have established breeding populations in many Wisconsin streams. The species has been extensively studied within its native range, but until recently there has been little research on the Great Lakes populations. In this study, we hypothesized that growth and survival of juvenile Coho Salmon over the summer months would be correlated with age. Young-of-the-year fish were captured in early and late summer 2012 from the Onion River, Bayfield County, Wisconsin. Otoliths (=ear stone) were removed and processed to expose daily growth rings, which were used to directly estimate age and growth (e.g., mm/d) for the two samples. Shifts in the distribution of fish ages from early to late summer formed the basis for a quantitative approach to gauging the age-specific selective pressures on summer survival. Our results revealed no effects of age on relative growth rates, but strong effects of age on mortality, with older fish experiencing higher mortality than younger fish. This research adds to the base of knowledge concerning the conservation and management of recreational salmonids in the Great Lakes.

Brennan Augustus Dow and Ong Xiong (58)  
Faculty Mentor/Collaborator: Todd A. Wellnitz  
**How Does a Reduction in Stream Current Lower Benthic Diversity?**

Flow and current are defining characteristics of streams and can have substantial effects on aquatic organisms and the communities in which they reside. A reduction in stream flow often leads to a decline in biological and functional diversity of benthic communities. The manner in which this decline occurs, however, is incompletely understood. To examine community responses to reduced flows, an experiment was conducted in the East River, a mountain stream near the Rocky Mountain Biological Laboratory (Gothic, CO), in August 2012. Sampling sites were distributed among five, 15-m study reaches that contained regions of slow, medium and fast current. Into each flow region was placed a 1-m² control and treatment site, giving 30 sites total. These sites were sampled twice for benthic macroinvertebrates and periphyton, once before and once after the treatment site had its flow reduced by approximately 50%. Preliminary analyses suggest that benthic community diversity and algal abundance decreases with decreasing flow and that community composition shifts. There is some evidence to suggest that a threshold velocity may exist such that lower current speed may cause an abrupt shift in benthic community structure.

Casey Marie Gabrhel and Kara Marie Braunreiter (59)  
Faculty Mentor/Collaborator: Jamie S. Lyman Gingerich  
**Identification of Factors Affecting Proper Localization of C. elegans PKD-2**

Our lab is interested in understanding how primary cilia, sensory antennae, sense and respond to cues from the cellular environment. Both humans and *C. elegans* have primary cilia, and since genes involved in cilia formation and function are highly conserved between these organisms, using *C. elegans* as a model can help us learn more about human primary cilia. For example, mutations in a gene encoding PKD-2 cause cilia abnormalities and associated phenotypes in both humans and *C. elegans*. To identify genes involved in the localization of PKD-2, we are using RNAinterference to systematically reduce the function of individual genes and analyze the effects on PKD-2 localization. We have screened 86.8% of the genes (2126 genes) on chromosome I and have identified 173 genes that affect PKD-2 localization. Current efforts include further analysis of the cilia phenotypes resulting from reduction of function of these genes and categorization of these genes based on structure, expression pattern, and proposed function.
Primary cilia act as sensory antennae and protrude from cell surfaces in most animals, including humans. To function, cilia structure must be maintained properly. Components necessary for cilia structure and function must be transported within the cilium. The protein, XBX-1, is part of the transport process and is crucial for ciliogenesis. In order to better understand the relationship between cilia structure, transport and function, we are examining two putative XBX-1 interactors: TWK-37 and E01A2.6. Mutations in XBX-1 have been shown to cause cilia malformation and dysfunction. We are assessing cilia structural integrity and receptor localization in C. elegans with impaired TWK-37 and E01A2.6 function. Due to the interaction of XBX-1 with TWK-37 and E01A2.6 we would expect to see structural and functional defects in cilia of C. elegans with these two genes impaired. Results of our analyses will better define the roles of these genes in cilia structure and function.

Sarah Kay Hof (30)
Faculty Mentor/Collaborator: Daniel P. Herman

Yeast 2 Hybrid Analysis of Candida albicans Proteins MBP1, Swi6 and Skn7

Candida albicans is a yeast that can cause opportunistic skin and mucous membrane infections, such as thrush and vaginal yeast infection, as well as systemic infections in immune-compromised patients. It has been well established that morphogenesis, the transition from yeast to filamentous growth forms, is essential for C. albicans to cause systemic infections. Previous work in our lab has shown that the Mbp1 protein is required for morphogenesis under nitrogen-limiting conditions on solid media. In addition, analysis of the amino acid sequence of Mbp1 revealed the presence of ankyrin repeat sequences, which suggests that Mbp1 interacts with other proteins to perform its function. This study is attempting to elucidate if MBP1 interacts with itself, Swi6 or Skn7 proteins. To accomplish this, the genes for the C. albicans proteins were each transformed into Saccharomyces cerevisiae and will be verified via PCR to confirm the presence of the wanted gene. A yeast two hybrid analysis will then be performed to test whether Mbp1 interacts with itself, Swi6 or Skn7. These results will help to identify proteins that interact with Mpb1 to promote morphogenesis and thus pathogenesis.

Alexandra Leigh Isaacson (3)
Faculty Mentor/Collaborator: Daniel S. Janik

Sympathetic Activation and Circadian Clock Resetting in Mice

Mice are nocturnal animals that exhibit predictable activity patterns controlled by their internal (circadian) clock. We have demonstrated that a mouse’s circadian clock can be reset 1-3 hours earlier by various manipulations: transfer from continuous light to complete darkness, administration of yohimbine, and administration of methamphetamine. We wanted to know what, if any, commonality exists among these treatments that might result in clock resetting. One possibility suggested by our observations was that during resetting, animals appeared to be aroused, possibly as a result of mild stress and sympathetic activation. One common sign of sympathetic activation is increased defecation. If these three methods of clock resetting are indeed working through the sympathetic nervous system, the animals should also show increased defecation in the period immediately after the manipulation. Therefore, we expect there to be a correlation between the defecation responses and the amount of circadian clock resetting caused by each of the three treatments. Preliminary results suggest that the expected correlation between defecation and clock resetting does not exist; however, we are currently running second trials of our experiments to clarify these results.

Megan Lee Koester and Jonathan Frank Ames (88)
Faculty Mentor/Collaborator: Chris H. Floyd

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

Conserving keystone species and the community that depends on them requires a good understanding of the keystone species’ feeding preferences. One of the most important keystone species is the Red-naped Sapsucker, a woodpecker that nests in aspen woodlands of western North America. Sapsuckers annually excavate a new nest cavity. Once abandoned, these cavities form essential nesting habitat for other cavity-nesting organisms. Sapsuckers also create sap wells in trees and shrubs, thereby incidentally providing food for other sap feeders. Local extinction of sapsuckers could thus trigger a decline in local species diversity, which is a conservation concern because sapsucker habitat has undergone widespread degradation. During June–July 2013, we investigated the criteria used by sapsuckers in their choice of sap well trees in aspens of the Rocky Mountains near Crested Butte, Colorado. Our results from 2012 suggested that sapsuckers either
prefer feeding from pathogen-infected aspens, or their well-excavation / sap-feeding tends to promote pathogen infection. In 2013, however, we found little evidence of these patterns. Our conflicting results might be due to our study sites in 2013 having comparably much lower incidences of both sap well excavation and/or pathogen infection. Our findings have important implications for management of aspen woodlands.

**Alyssa Nicole Kruger and Madeleine Marie Hacker (90)**  
Faculty Mentor/Collaborator: **Lloyd W. Turtinen**  
*Local Prevalence of Ticks Carrying the Lyme Disease Bacterium*

Our ongoing study has been to survey local deer tick populations in a 50-100 mile radius of Eau Claire for the presence of *Borrelia borgdorferi* bacteria. This bacterium, which is transmitted by a tick bite, is responsible for Lyme disease in humans and other animals. Students in Biology 306 (Infectious Disease Ecology) and faculty in the Biology Department have collected ticks over the past 3 years by sweeping methods or visual detection on clothing. This past year DNA was extracted from individual ticks and processed by a real-time polymerase chain reaction (qPCR) to detect the *B. borgdorferi* *rec A* gene. Ticks positive for the bacteria were identified by the presence of a 222 base pair DNA product with a melting temperature (Tm) of 82°C. The DNA size was verified by gel electrophoresis. To date, among the 57 assayed ticks, we have observed approximately 25% of the ticks carrying the bacterium. Local areas of interest with positive ticks included: Putnam woods, Lowes Creek Park, and the Downsville area.

**Breana Rae Meyer (87)**  
Faculty Mentor/Collaborator: **Chris H. Floyd and Garry Leonard Running**  
External Collaborator: **Eric Merten**  
*Frogs, Toads, and Bats Oh My! – Results of Population Surveys Conducted on Islands of the Chippewa River*

Anurans (frogs and toads) and bats are among the most threatened vertebrates in North America, indicators of ecosystem health, and important for pest-control. Our objective was to provide ecological information on anurans and bats and their associated habitats on islands of the Chippewa River. Our findings will help guide wildlife management on the islands, managed by our funding source for this project, the US Bureau of Land Management. During May-July 2012 we conducted acoustic surveys of anuran and bat populations on 26 BLM islands, ranging along a 120-mile stretch of the lower Chippewa River (from Imalone to Battle Island). On islands with ephemeral ponds we used depletion and mark-recapture methods to estimate anuran abundance. Bat acoustic surveys were conducted using a mobile detection device in coordination with the citizen-based, Wisconsin Bat Monitoring Program run by the Wisconsin DNR. Habitat characteristics of each island were also assessed. Because of the record-early, warm spring in 2012, we missed the breeding season of most anurans. However, our methods developed in 2012 will be used to complete our surveys in April-May 2013. We present our preliminary results for bat and anuran surveys, including estimations of anuran density on islands with ephemeral ponds.

**Christopher Alan Monte and Beatrice Rae Soderholm (31)**  
Faculty Mentor/Collaborator: **Daniel P. Herman**  
*Antibiograms for MRSA Isolates from a Regional Hospital in El Oro Province, Ecuador*

Methicillin-resistant *Staphylococcus aureus* (MRSA) is an antibiotic-resistant strain of the bacterium *Staphylococcus aureus*. MRSA poses serious health threats on the global scale, accounting for a significant portion of hospital-acquired infections and resulting in thousands of deaths annually. Little published data exists on the prevalence of MRSA in Ecuador, resulting in a poorly understood health impact for the country. In this study, nasal swabs were obtained from patients and staff at a regional hospital in El Oro Province, Ecuador. Health surveys were also conducted to assess risk factors for MRSA colonization. Samples were screened for the presence of MRSA using both cultural and PCR based identification methodologies. PCR results indicate that of the 499 samples collected, 33 (6.6%) samples were MRSA positive. Antibiotic resistance profiles were created for each of the 33 MRSA positive samples by performing minimum inhibitory concentration (MIC) tests for growth using a broad range of antibiotics, such as vancomycin, erythromycin, oxacillin, and ampicillin. All MRSA isolates demonstrated resistance to multiple antibiotics in addition to methicillin resistance. The results indicate that MRSA is a potentially serious health threat in this hospital that warrants further investigation.
Characterization of a Red Light-Insensitive *Arabidopsis thaliana* Mutant Identified in a Genetic Suppressor Screen

*LRB1* and *LRB2* genes found in the model dicotyledonous plant *Arabidopsis thaliana* act as negative regulators of red light signaling. Mutation of *LRB1* and *LRB2* produces plants that are hypersensitive to red light. In order to identify other genes that participate in this pathway, a genetic screen was conducted to identify lines which contain mutations which alleviate the red light hypersensitivity of the *lrb1/lrb2* mutant. One of these lines identified in this screen, *lbs1*, displays strong red light insensitivity. To determine the gene disrupted in this line, we conducted a genetic mapping experiment which localized the *lbs1* mutation to a chromosomal region containing the *PHYB* gene. This gene encodes phytochrome B, the dominant photoreceptor in the red light pathway. Complementation tests suggested the suppressor mutation in *lbs1* was likely in this gene. Sequencing of the *PHYB* gene in *lbs1* identified a G to A substitution in the last nucleotide of intron 1. RT-PCR analysis confirmed misplicing of the *PHYB* transcript in *lbs1*. As a result, the mutant *PHYB* gene in *lbs1* is predicted to encode a truncated version of *PHYB*.

**Gregory Thomas Nelson and Zoie Lynn Zehner (63)**

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

*Interacting Influences of Global Change Factors on Leaf Stomatal Response in Prairie Grasses*

Plants acclimate to fluctuating environmental factors by altering their growth and physiology to best cope. Stomata, the small pores on leaf surfaces that are the site of gas exchange, function effectively only by responding appropriately to physiological and environmental cues. Previous work has focused on how individual environmental factors influence stomatal density, whereas in natural settings plants are subjected to multiple stresses simultaneously. Therefore, our goal was to better understand how multiple environmental factors interact to affect stomata through investigating the stomatal density responses of three prairie grass species grown under factorial combinations of CO2, nitrogen, and water availabilities. Both young and older leaves were sampled to capture responses across the season. Unexpectedly, leaves grown under elevated compared to ambient CO2 had higher stomatal densities in two of the three species while water and N availability affected leaves only at the end of the season. For all species, older leaves had a significantly lower stomatal density than young leaves. This suggests that plants can adjust stomatal density to changes under certain conditions over the growth season. As stomatal numbers were mostly unaffected by environmental factors, acclimation to prevailing environmental conditions must also involve modulation of the opening and closing mechanism.

**Gregory Thomas Nelson, Nathan Zachary Servey, Katie Klundt, Molly Dieterich, and Brandon Jeffrey Urhammer (64)**

Faculty Mentor/Collaborators: **Evan R. Weiher** and **David Lonzarich**

*Evaluation of Conceptual Synthesis Model through Trait Beta Diversity*

Community assemblage processes are phenomena exhibited throughout taxonomic groups and have been a central theme of ecology. Here we evaluate two historically dichotomous assembly theories – niche based theory and neutral theory – and then attempt to synthesize the two into one conceptual framework. Representative wetland and upland prairie vegetation communities were surveyed from around the lower Chippewa Valley over the summer of 2012. Environmental conditions at each site were captured by measuring soil moisture, light transmittance, and soil organic matter content. Plant community composition was captured on a species basis as well as on a functional trait basis. Beta diversity (the rate of change in community composition through space) was calculated for each community. A structural equation model was constructed to analyze the standardized effects of various abiotic and biotic factors on the respective beta diversities. Light transmittance and soil moisture had the highest standardized effects on species beta diversity (0.42, 0.23) and trait beta diversity (-0.35, 0.50). We found that when environmental stresses were low, beta diversity increased. This suggests that deterministic niche processes are prominent when environmental stresses are high and community assembly becomes more neutral as stresses are reduced.

**Brianna Leigh Nicolet and Cary James Schneider (4)**

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

*Does Limiting Night-time Locomotor Activity Result in Greater Circadian Clock Resetting?*

Mice held in a cycle consisting of 12 hours of bright light and 12 hours of dim light (BD) before transition to complete darkness exhibit greater circadian clock resetting than mice held in 12 hours of bright light and 12 hours of complete darkness (LD). Additionally, mice in the BD condition show much less night-time activity than mice in the LD condition. Is
this reduction in activity the reason for the increased clock resetting seen in BD mice? To test this hypothesis, we are attempting to limit the amount of night-time activity of mice held in LD to that of mice held in BD by blocking their exercise wheel each night. To do this, we have devised an automated control system using Labview software and hardware to stop wheels each night after a specific number of revolutions. If reduction of activity is the cause of greater clock resetting, mice with limited wheel running held in LD should exhibit a shift in clock resetting similar to that of mice in BD.

Zachary Stephen Nonn, Aaron Roderic Devoe, Anna Kirsten Johnson, Kari Lynn Rue and Jason Gerald Garfoot (27)
Faculty Mentor/Collaborator: Todd A. Wellnitz
What Factors Influence Lichen Community Structure on Rock Substrate

Species of soil lichens have been shown to have cooperative relationships with each other under high stress conditions. We went to the Boundary Waters Canoe Area Wilderness in northern Minnesota to see if such facultative interactions occurred among lichen species found on shoreline rock faces. We used quadrat sampling to examine shoreline lichen communities along a stress gradient that ran perpendicular from the water’s edge and extended approximately 3-m inland. We assumed that 1) the water’s edge presented high stress conditions because of wave action and ice scouring, and 2) species found together more often than would be predicted by chance indicated a possible facultative relationship. We found no significant difference between the co-occurrence of common species and the null model (p=0.2460). However, we did find that species diversity increased with tree canopy cover on the upper slope (p=0.0066) and that diversity was higher on North-facing slopes. Therefore, if stress does promote facilitation, sunlight is likely a stronger influence than slope or distance from shore.

Ilse Evelyn Renner, Vladislav Suntsov, Kaleigh Spickerman and Erik Michael Lindberg (57)
Faculty Mentor/Collaborators: Evan R. Weiher and David Lonzarich
Taxonomic and Functional Based Beta Diversity in a Western Wisconsin Forest Community Understory: Stochastic verses Deterministic Community Assembly

Beta (β) diversity encompasses the measurable variation or dissimilarity in community composition. High measures of β-diversity imply stochastic community assembly processes whereas low measures of β-diversity imply deterministic or niche-based assembly processes. This study investigates both taxonomic as well as functional β-diversity in order to uncover the driving effects of environmental interactions on the assembly of plant species and traits. We established 23 relevé points which spanned variation in canopy cover and soil moisture in the understory of the Chequamegon-Nicolet National Forest in the Medford district. At each relevé point we had five sample plots from which we took a representative leaf sample of each species present and measured their functional traits. Species abundance was estimated visually in terms of percent cover. Various environmental data were also collected. Preliminary results suggest mean light availability promotes a directly negative and an indirectly positive effect on taxonomic β-diversity, but no effect on functional β-diversity. Conversely, mean soil moisture had a direct positive effect on functional β-diversity and no effect on taxonomic β-diversity. This implies that light availability acts as an environmental filter on taxonomic β-diversity whereas soil moisture acts as an environmental filter on functional β-diversity.

Anna Patricia Rice, Jordan Teal Montpetit, and Gavin Reid Sunde (62)
Faculty Mentor/Collaborator: Derek J. Gingerich
A Genetic Screen to Identify Mutations that Lead to Light Hypersensitivity in Arabidopsis thaliana

LRB1 and LRB2 are genes that participate in the red-light signaling pathway of the model plant species Arabidopsis thaliana. Mutations in both LRB1 and LRB2 cause red-light hypersensitivity. Along with LRB1 and LRB2, we hoped to identify additional genes that also play a role in this pathway. To do this, we conducted a series of genetic enhancer screens to identify mutations which exacerbate the phenotypic characteristics of the lrb1/lrb2 mutants. For this screen, ~2,000 lrb1/lrb2 mutant plants were subjected to random mutagenesis using ethyl methanesulphonate. These M1 generation plants were allowed to self-fertilize to produce an M2 generation. >30,000 M2 plants were screened for enhancer mutations by identifying individuals with an enhanced lrb1/lrb2 phenotype under red light. This screen has now been completed and over 410 putative mutants have been identified. To verify that the plants possess truly enhanced red-light hypersensitivity and that the phenotypes are not the result of other defects in growth and development, M3 seeds obtained from these lines were grown under a range of red-light fluence levels. This second-round screening is ongoing, and 85 lines have been analyzed. Based on this screening, 11 of the 85 lines appear to be bona fide red-light hypersensitive mutants.
The yeast species *Candida albicans* is the most commonly isolated yeast in human disease and systemic *C. albicans* infections account for nearly 60% of morbidity and mortality in immunocompromised patients. To infect host tissue, the unicellular yeast-like form switches to the tissue invading, multicellular filamentous or hyphal form. This yeast to hyphae conversion contributes significantly to the pathogenesis of *C. albicans* and genes involved in this conversion are putative targets for new antifungal drugs. In collaboration with Dr. Dan Herman in the UWEC Biology Department we are investigating the role of *MBP1* in this morphological conversion. To further our understanding of *MBP1* in *C. albicans*, we expressed *C. albicans MBP1* in *S. cerevisiae*, and our results indicate it suppresses a synthetically lethal *mbp1Δ swi4Δ* phenotype. This suppression of lethality indicates *C. albicans MBP1* can functionally replace *S. cerevisiae MBP1*. We hypothesize that *C. albicans MBP1* is involved in the yeast to hyphae shift through its role in regulating cell cycle genes. To further investigate, we are constructing a fusion protein of *C. albicans MBP1* and GFP (green fluorescent protein). This will allow us to determine whether *C. albicans MBP1* localizes to the nucleus, the site of gene regulatory activity in the cell.

Stream current velocity is known to affect the distribution and abundance of algae by enhancing nutrient exchange and detaching algal cells. Current may also have indirect affects on algal abundance by influencing the distribution of sessile aquatic insects that use algae in the construction of their protective retreats. To examine these direct and indirect effects, we collected 45 benthic samples (225 cm$^2$) from the streambed of the Chippewa River across a velocity gradient ranging 5-100 cm s$^{-1}$. We found positive relationships between 1) current velocity and algal biomass, but only up to 70 cm s$^{-1}$, 2) current velocity and the density of *Ceratopsyche*, a common retreat-building caddisfly, and 3) *Ceratopsyche* density and algal biomass. In addition, we found 4) a positive relationship between benthic macroinvertebrate species richness and algal biomass. A structural equation model showed that current velocity influenced both *Ceratopsyche* density and algal abundance, and that there was a significant effect of *Ceratopsyche* density on algal abundance. Our data suggest a strong indirect relationship between current velocity and algal abundance, acting through *Ceratopsyche* density.

Yellow Perch are common in many Wisconsin lakes, and can also be a common and important member of large river fish communities. Lake populations of Yellow Perch have been extensively studied, but relatively little research has been conducted on populations in river ecosystems. In this study, we explored the effects of birth date on the early growth and survival of juvenile Yellow Perch in the Lower Chippewa River. Young-of-the-year perch captured in early and late summer 2012 had their otoliths (~ear stone) removed and processed to expose daily growth rings. We used these age data to directly estimate age and growth (e.g. mm/d) for each of the two sampling periods. Shifts in the distribution of fish ages from early to late summer formed the basis for a quantitative approach to gauging the age-specific selective pressures on summer survival. Our results revealed mixed effects of age on relative growth rates, but strong effects of age on mortality, with older fish experiencing higher mortality than younger fish. This research adds to the base of knowledge concerning the conservation and management of riverine populations of Yellow Perch.

Rusty crayfish, *Orconectes rusticus*, are native to the Ohio River basin and have rapidly expanded their range throughout lakes and streams of the upper Midwest, threatening local ecosystems. In order to assess the threat of these invasive crayfish on the lakes of the Boundary Waters Canoe Area Wilderness (BWCAW), as well as factors influencing the population density and species distribution of native crayfish, we conducted a population survey on seven frequently travelled lakes. We set minnow traps at depths of 1, 2, 3, 4 and 5 m and conducted active visual surveys along lake shorelines. Environmental data (e.g., Secchi depth and substrate type) were also collected for each lake sampled. Our results indicate that trap
depth positively correlated with the number of trapped crayfish whereas lake productivity showed a negative correlation with trapped numbers. Furthermore, substrate type was shown to be a significant factor such that crayfish were more abundant on rocky versus sandy bottoms. *O. obscurus* was found in just one lake; however, collecting pre-invasion baseline data is essential first step in managing this invasive species and controlling its spread.

**Joel Harrison Smith and Joseph J. Weirich (162)**
Faculty Mentor/Collaborator: Deborah Ann Freund

*Datazone Biodiversity Project: Research Dissemination and Science Outreach in the Galapagos Islands*

The Datazone biodiversity database, operated by the Charles Darwin Foundation (CDF), is a dynamic platform of up-to-date scientific research on the Galapagos Islands. Datazone contains current information about science in the Galapagos, including: the first comprehensive census of native and introduced species, a taxonomic registry, the largest collection of vertebrates, invertebrates, marine animals, and botanical specimens of the archipelago, the most complete archive of Galapagos publications, and a current meteorological database. Datazone makes scientific information available to a wide audience: the Galapagos National Park Service, Quarantine Service, local municipalities and governments, students, and the international community. During the summer of 2012, Jon Bowen, Deborah Freund, Jordan Gibbs, Josh Pletzer, Robert Rohloff, Joel Smith, and Joe Weirich worked as international volunteers to improve and expand the different databases within Datazone. Projects included: photographing and uploading high resolution images and inserting metadata, updating species and collections information, publishing articles about Galapagos taxa, and organizing GIS (Geographic Information Systems) data. These contributions help to increase public access to scientific information about Galapagos in order to promote the sustainable management and general understanding of the archipelago.

**Beatrice Rae Soderholm (32)**
Faculty Mentor/Collaborator: Daniel P. Herman

*Speciation of Methicillin-Resistant *Staphylococci* Isolated from Ecuadorian Hospitals and Communities*

Surveillance of methicillin-resistant *Staphylococcus* previously focused on the well characterized *aureus* species (MRSA). Community and hospital samples collected from various regions of Ecuador from 2010-2012 revealed the majority of methicillin-resistant *Staphylococcus* (MRS) are not of the *aureus* species. These species are speculated to be important in the acquisition of methicillin resistance in *S. aureus* by serving as a reservoir for the SCC-mec cassette, which is the genetic element responsible for methicillin resistance. Speciation of the methicillin-resistant *Staphylococcus* isolates from Ecuador will allow us to develop a better understanding of how antibiotic resistance is transferred between *Staphylococcus* species. We tested a PCR protocol to identify the species of *Staphylococcus* that are resistant to methicillin. The protocol identifies species based on an intergenic region between the 16S and 23S rDNA regions on the chromosome [1]. The banding pattern from this intergenic region is specific to each species. Preliminary results indicate the majority of MRS isolates are *Staphylococcus haemolyticus*, though the method was successful in identifying other species of staphylococci. We conclude that the method is successful in identifying *Staphylococcus* to the species level, although this protocol may not be reliable for differentiating subspecies.

**Hannah Elizabeth Stage and Hannah Kristine Samuel (29)**
Faculty Mentor/Collaborator: Sasha A. Showsh

*Isolation and Characterization of MRSA at UW-Eau Claire*

Methicillin-resistant *Staphylococcus aureus* (MRSA) was first discovered in 1961 shortly after the introduction of the antibiotic methicillin. In 2005 the CDC reported 94,000 cases of MRSA infections and of those infections 19,000 resulted in deaths. Approximately 85% of the MRSA cases were associated with hospitals (hospital acquired MRSA) and the remaining 15% were from the community (community acquired MRSA). We surveyed the UW-Eau Claire campus for the presence of MRSA. The results indicate that of all the bacteria isolated, the percentage of *S. aureus* isolated from the student athlete equipment (gymnastics beams) was up to 43%. Of those *S. aureus* isolates we tentatively confirmed 3 (1.8%) MRSA isolates. Similarly, of all the bacterial isolates from general student athletics we isolated up to 16% *S. aureus* from which we tentatively confirmed 3 additional MRSA isolates (from ellipticals and treadmills). In the general student population areas (ATM keypads, water fountains, etc.) up to 36% of the isolates were *S. aureus*, with all of the strains testing negative for methicillin resistance. We are currently in the process of gathering more samples of potential MRSA isolates, confirming the identities of isolates by polymerase chain reaction (PCR) and assaying for the transfer ability of the methicillin resistance gene.
Stream logjams are accumulations of in-stream wood that can alter features of their surrounding habitat, including water velocity and depth, streambed substrate, and insect and organic matter concentration. Aquatic insects, which are sensitive to changes in their environment, can respond to these changes. They are important participants and indicators of ecological processes (e.g., degradation, nutrient cycling, material transport). We want to establish the impact of logjams on insects. We used a BACI experimental design with paired sample sites to evaluate the impact of an artificial logjam introduction on the composition of the insect community of a stream in Northern Minnesota. We found that one year after the logjam installation, mean abundance and richness of mayflies (Ephemeroptera) and stoneflies (Plecoptera) increased, while mean abundance of caddisflies (Trichoptera) and true flies (Diptera) decreased. As a result, evenness of the community increased at the logjam site. Mean diversity and overall community composition did not change. Our findings suggest that logjams may differ in their impact on different insect orders, at least in the initial year. However, this may contribute—as it did in our stream—to the evenness of the insect community, which is thought to improve ecosystem stability and productivity.

CHEMISTRY

Mahmoud Kareem Ahmed (178)
Faculty Mentor/Collaborator: Christine M. Morales

Infrared Spectroscopy of a Copper-Hydride Molecule

It is essential to understand Metal-Hydrogen bonding in order to find a safer and lighter hydrogen storage material. (BDP)CuH is a stable complex that contains a Copper-Hydrogen bond and the phosphine ligand BDP. By using both experimental and computational methods, we expect to learn more about copper-hydrogen bonding and about the infrared spectroscopy of (BDP)CuH. The infrared spectroscopy was done using the solution phase IR. Also, for comparison, we performed infrared spectroscopy of (PPh₃)₃CuH in the solid phase using the diffuse reflectance attachment. Once this data was obtained from the infrared spectra, we then compared it with data from WebMO. The infrared spectra of (BDP)CuH and (PPh₃)₃CuH have not been observed in previous studies. Our research group has constructed computational models of these molecules. After successfully obtaining the infrared spectrum of (BDP)CuH, we hope to see the region where the Cu-H stretch shows up. This data will help us determine the strength of the copper-hydrogen bond.

Luke Patrick Anderson (118)
Faculty Mentor/Collaborator: David E. Lewis

Reactions of 4-hydroxycoumarin with Alpha-cyanocinnamates

During attempts to prepare precursors for warfarin labeled with a protein tag, we found that many of the reactions beginning with warfarin itself failed to give the desired products, but led, instead, to cyclized products. In an effort to overcome these difficulties, we prepared a potential warfarin-like compound by the reaction between an α-cyanocinnamates and 4-hydroxycoumarin in pyridine. The reaction did not give the expected warfarin-like product, but another set of cyclized products. The synthesis of the α-cyanocinnamates and the products of their reactions with 4-hydroxycoumarin will be presented, and mechanisms for the formation of the products will be proposed.

Maxwell Steven Anschutz (177)
Faculty Mentor/Collaborator: Christine M. Morales

Computational Analysis of Movement in Metal-Hydride Complexes

A better understanding of metal-hydride bond energies will allow for safe and predictable hydrogen storage. Real metal complexes display dynamic movement. This movement will alter the molecular properties of these complexes. Specifically, metal-hydride bond energies are seen to fluctuate in response to metal-ligand composition and bond length. Theoretical computational chemistry can be used to predict complex behavior in an actual system. Many metal hydride complexes have been modeled computationally, but the molecular properties of these complexes when moving about a system have not been modeled. We chose several metal-ligand complexes to model using quantum chemical computations. B3LYP hybrid functional theory with a LANL2DZ-routine metals basis set was employed. We examined calculations from both
metal-ligand bond length and hydride-metal-ligand bond angle scans. Bond length scan calculations show that the metal-
hydride bond energy depends on the length of the metal-ligand bond as well as the conformation of the hydride. Bond
angle scan calculations show how bond energy differences between the trans and cis conformations arise. Bond length and
bond angle scans are reported for Cobalt, Nickel, and Copper with different ligand attachments. These results will be used
to understand the effects of ligand movements on these transition metal hydride complexes in solution.

**Thomas George Bartholow (120)**
Faculty Mentor/Collaborator: Sudeep Bhattacharyay

*Calculation of Redox Potentials of Type-I Blue Copper Proteins using Quantum Mechanical/Molecular Mechanical Simulations*

Type-1 copper centers belong to the family of metal-containing oxidoreductases, where the redox-active moiety is a copper ion bound in a nitrogen-sulfur donor environment. These metallosites, commonly known as blue copper proteins, act as electron mediators within electron transport chains as the copper shuttles between Cu(I) and Cu(II) states. In terms of reactivity, the type-1 sites show a large variability in redox properties with observed reduction potentials ranging from 200 to 1,000 mV, or a variation of ~ 18 kcal/mol. The cause of this huge fluctuation is unclear and only speculated to be due to active site hydrophobicity, axial ligation, and outer sphere coordination. In order to gain an insight into the role of the protein matrix on the redox potential of the copper center, we are using combined quantum mechanical/molecular mechanical simulation. Density functional theory has been standardized for small molecules and subsequently used for modeling enzyme active sites. In the present work, the copper center and the atoms within its primary coordination sphere are treated with density functional theory, while embedded in a molecular mechanically treated region. Results of these studies on model systems as well as type-I proteins will be presented.

**Kaitlin Marie Bloomgren (154)**
Faculty Mentor/Collaborator: James A. Phillips

*Structural and Energetic Properties of HCN–BCl₃ via Computations*

We are interested in the effects of condensed-phase environments on the structural properties of nitrile – BCl₃ complexes. HCN–BCl₃ is the smallest member of this class of systems, and as such, is an ideal system for testing various computational methods that will be used on larger complexes. In this vein, we have used DFT and post Hartree-Fock methods to compute structures, vibrational frequencies, and B-N potential curves for HCN–BCl₃. For the vibrational frequencies, we also compared the results of each method to free BCl₃, for which comparisons to experimental data are possible. In this validation study we found that HSEh1PBE, B972, and mPW1PW91 gave the best agreement with experiment, with RMS errors of about 7.5 cm⁻¹. For HCN–BCl₃, we obtained two distinct minimum-energy structures, with B-N distances of about 1.6 Å and 2.8 - 3.3 Å, depending on the initial bond length for the optimization. We also mapped B-N potential curves, which reveal a significant barrier between these minima, and indicate that the shorter, 1.6 Å minimum is global, regardless of method. Current efforts are concerned with examining the effects of bulk dielectric media on the potential, and extending this work to the analogous BBr₃ complex.

**Amanda Rae Buchberger (153)**
Faculty Mentor/Collaborator: James A. Phillips

*Condensed-Phase Effects on the Structural Properties of FCH₂CN–BF₃ and ClCH₂CN–BF₃: A Matrix-Isolation and Computational Study*

We have assessed the degree to which bulk, condensed-phase environments affect the structural properties of FCH₂CN–BF₃ and ClCH₂CN–BF₃ using both low-temperature IR and computations. We have obtained the infrared spectra of both complexes in solid nitrogen and neon, and have assigned the B-F asymmetric stretching and BF₃ “umbrella” modes, and they are shifted from those of the gas-phase structure. Experiments in solid argon are in progress. In addition, we have mapped the B-N bond potential using both DFT and post-HF methods and modeled the effects of the bulk, condensed phase media using the PCM model. The potentials are flat such that the inner, bonded region lies only 3-5 kcal/mol above the global minimum (~2.4 Å). However, preferential solvation of the inner region causes the minimum to shift inwards with increasing dielectric constant. Both experiment and theory indicate that inert matrix environment significantly affects the structures of these complexes.
Samuel Joseph Danforth and Kaitlin Marie Bloomgren (147)
Faculty Mentor/Collaborator: James A. Phillips
Structural Properties of Haloacetonitrile–BCl₃ Complexes via Computations and Low-temperature IR Spectroscopy

We are exploring the effects of bulk, condensed-phase media on the structural properties of haloacetonitrile-boron trichloride complexes (XCH₂CN–BCl₃, X=F, Cl), using both computations and low-temperature IR spectroscopy. Both DFT and post Hartree-Fock computations indicate that two minima occur along the B-N bond coordinate, and that these minima are separated by a significant barrier. The inner (global) minima lie at B-N distances of about 1.6 Å and the binding energies range from 8.7 to 1.9 kcal/mol. The outer, secondary minima are much shallower, 4.5 – 0.5 kcal/mol, and occur near B-N distances of 2.8 Å to 3.1 Å. We have also calculated vibrational frequencies, and these indicate that key, structurally-sensitive vibrational modes shift markedly between these two minimum energy structures. As such, we are currently obtaining low-temperature IR spectra of these complexes, both in BCl₃/XCH₂CN films and inert, noble gas matrices, to determine which structure exists under such conditions.

Luke W. Desilet and Michael O’Neal McAnally (182)
Faculty Mentor/Collaborator: Stephen Drucker
Jet-Cooled Fluorescence Excitation Spectrum of Gamma-Pyrone

The compound γ-pyrone (C₅H₄O₂) is a conjugated enone molecule that serves as a prototype for investigating the photochemical properties of larger similarly conjugated systems. The first step in such investigation is to understand the changes in structure and dynamics that accompany photoexcitation. To accomplish this objective we have recorded the fluorescence excitation spectrum of γ-pyrone under the cooling conditions of a supersonic free-jet expansion. The measured spectral region, near 350 nm, includes the S₁(n,π*) ¬ S₀ band system. This work complements and refines a previously published investigation (R. D. Gordon and W. K. C. Park, Canadian Journal of Chemistry 1993, 71, 1672) of the S₁(n,π*) ¬ S₀ spectrum measured at room temperature. We have assigned about 15 vibronic bands in the jet-cooled spectrum, improving the precision of the previous [1] assignments, making several corrections to the earlier [1] work, and assigning several bands that were not observed previously [1] because of hot-band congestion at room temperature. The present results will serve to benchmark computational techniques aimed at determining vibrational frequencies of medium-sized organic molecules in their electronic excited states.

Nathan Paul Fuhrman (240)
Faculty Mentor/Collaborator: Patricia Anne Cleary
Data Analysis and Model Comparison of Atmospheric Ozone above Lake Michigan

Stable atmospheric conditions trap ozone precursors found in smog in a layer above the surface of Lake Michigan. In 2008-2010 hourly measurements of ozone concentration were taken by an ozone analyzer onboard the Lake Express Ferry that traveled from Milwaukee, WI to Muskegon, MI. Although ozone concentration in the atmosphere around Lake Michigan is monitored at sites on land, these data are the first measurements taken over the lake where ozone is predicted to be high. These observed data were filtered based on the presence of the ozone precursor of carbon dioxide to remove concentrations that were unrepresentative of the regional air mass. The observed atmospheric ozone data will be analyzed to look for trends which will be compared to a national model for the purpose of evaluating the accuracy of the model for the region. Data will continue to be studied further to examine the spatial distribution of ozone over the lake.

Jared Mason Gillingham and Michael Joseph Schmidt (117)
Faculty Mentor/Collaborator: David E. Lewis
Peroxide Bond Cleavage in the Dianions of Peroxy-bis-enols: A Computational Study

The vitamin K-dependent g-glutamyl carboxylase carries out a unique post-translational modification of proteins that involves the insertion of a molecule of carbon dioxide into the g position of Glu side chains, converting them to Gla residues. This reaction, which is highly endothermic, is driven by the strongly exothermic oxidation of the reduced form of vitamin K into vitamin K 2,3-epoxide and water by the base-catalyzed reaction with molecular oxygen. The currently accepted mechanism for this reaction involves the formation of a “super” base, which we believe to be incompatible with a living cell. We suggest that free radicals may be involved, and that the dianion of a peroxy-bis-enol may be a critical intermediate in the enzymatic reaction. The results of computations, and their impact on a free radical mechanism for this reaction will be discussed.
Joseph Julian Heimann (211)
Faculty Mentor/Collaborator: Roslyn M. Theisen
Biomimetic Model Complexes of Dioxygenases

Cysteine Dioxygenase and Quercetin Dioxygenase are two important dioxygenase metalloenzymes having vital roles in biochemical processes that affect our body and the environment. Biomimetic modeling is the design of metal complexes that are both structural and functional analogues of the active sites of metalloenzymes. Using these analogues it is possible to gain greater insight into the catalytic mechanism of these enzymes, as well as providing catalysts for studying new synthetic transformations, bioremediations of aromatic and heteroaromatic waste compounds, green chemistry catalysis, or used as potential drug targets. Our work includes the synthesis and structural characterization of molecules with one or more characteristics of the active site of these dioxygenase enzymes. Iron(II)Salen, Copper(II)Salen, and Nickel(II)Salen were synthesized and characterized via IR spectroscopy, UV/Vis, and Mass spectrometry.

Cheng Her (151)
Faculty Mentor/Collaborator: Thao Yang
Synthesis and Antibody Binding Study of a Cyclic Dimer MUC1 Mucin Peptide

MUC1 mucin is a large transmembrane glycoprotein found in cells of epithelial lineage. Normal MUC1 protein displays an extensive pattern of glycosylation that shields the protein core from the extracellular environment while that of a cancer associated MUC1 mucin has an exposed protein core as a result of aberrant carbohydrate expression. MUC1 monoclonal antibodies have the potential to bind to certain residue sequences on the exposed MUC1 mucin protein core. We have previously characterized one antibody target to be the peptide with sequence GVTSAPD which is found in the 20 amino acid tandem repeat unit of aberrantly glycosylated extracellular MUC1 mucin proteins. In an effort to engineer an optimal peptide antigen with potential therapeutic applications, we synthesized and studied the structural and monoclonal antibody binding ability of a cyclic dimer peptide composed of the sequence GVTSAPDGVTSAPD. The peptide was synthesized via Solid-Phase Peptide Synthesis using Fmoc chemistry and studied by 2D NMR techniques (TOCSY and ROESY), and Saturation Transferred Difference NMR (STD-NMR). STD-NMR results indicate that the cyclic dimer peptide has increased binding to the antibody.

Shane William Hodgson, Hilary Elaine Wiltgen and Joseph Julian Heimann (210)
Faculty Mentor/Collaborator: Scott C. Hartsel
Wrapping Drugs in Butter: Developing New Oral Delivery Systems for Amphotericin B

One of the most common serious diseases of the developing world is almost unknown in this country. It is Leishmaniasis, also known as kala-azar. After malaria, this is the most common fatal parasitic infection in the world. It is difficult to treat and has demonstrated increasing rates of resistance toward many main-line drugs. Fortunately, there is a drug which is very effective, almost never generates resistance and is very inexpensive—Amphotericin B (AmB). The problem is that this drug is not available in a stable oral form which would be advantageous in tropical climates. The most common preparation of AmB is administered intravenously as a micellar dispersion. This dispersion shows poor selectivity between mammalian and parasite cells and hence increases human toxicity. However, by employing lipid carrier complexes, a formulation can be implemented to control the toxicity, specificity, solubility, and stability of this drug and improve digestive tract absorption. Our objective was to develop and establish procedures for testing and characterization of novel orally-available lipid drug delivery formulas for AmB. We have evaluated these and other lipid mixtures by stopped-flow spectroscopy to clarify the relationship between composition and drug activity in in vitro model systems.

Andy Johnson (209)
Faculty Mentor/Collaborator: Kurt Wiegel
Supramolecular halogen bonded liquid crystalline polymers and networks: A study of weak associations on mesophase stability

The application of halogen bonding towards the assembly of liquid crystalline materials is a relatively recent study. While the structure and energetics of the hydrogen bond is well-established, the electrostatic attraction of the halogen bond is considerably less well-known. A series of polymers and networks utilizing 2,3,5,6-tetrafluoro-4-iodo benzene species as the halogen bond acceptor group will be synthesized. The overall stability of the halogen bond will be studied by probing the thermodynamics of the liquid crystalline phases, and compared to structurally analogous hydrogen bonding species.
Jason Van Jorstad (183)
Faculty Mentor/Collaborator: Christine M. Morales
Finding Appropriate Methods to Calculate Metal and Metal Hydride XPS Spectra

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

Kayla Anne La Plante (124)
Faculty Mentor/Collaborator: David E. Lewis
Kinetics of Competing Reactions of N-aryl-4-chloro-1,8-naphthalimides with Primary Amines

The 4-amino-1,8-naphthalimide ring system is the basis of a number of important fluorophores due to its chemical and photochemical stability. In addition, the conventional wisdom states that when the imide ring is formed by treating naphthalic anhydrides with primary amines, the new heterocyclic ring is resistant to attack by nucleophiles. We have discovered that this is not the case, and that the imide ring of 4-chloro-N-aryl-1,8-naphthalimides is, in fact, susceptible to attack by primary amine nucleophiles. The kinetics of this reaction have been studied in n-butylamine, and show a Hammett plot with excellent linearity. In this reaction, there is also a possibility that there is general acid/base catalysis. In this project, we have examined the effects of alcohol solvents and tertiary amine co-solvents on the reactions of 4-chloro-N-aryl-1,8-naphthalimides on the rates of the displacement reaction with n-butylamine in order to explore this possibility. The results of our kinetic studies will be presented.

Morgan Levi Leider (184)
Faculty Mentor/Collaborators: Frederick W. King and Christine M. Morales
Numerical Evaluation of One-Center Four-Electron Correlated Integrals

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

Brian Timothy Meeuwsen (180)
Faculty Mentor/Collaborator: Bart J. Dahl
Synthesis of Deuterated, Protected Amino Acids-Tyrosine and Serine

The purpose of this project is to synthesize protected deuterated compounds as a collaborative project with Dr. Laurie Parker from the University of Purdue. Dr. Parker will use these deuterated protected amino acids to develop the first steps in a multiplex quantification of kinase activity in a breast cancer model system using surface-enhanced Raman spectroscopy and peptide-functionalized nanoparticle biosensors. Because these deuterated amino acids are costly, the synthesis for each amino acid was tested using a non-deuterated form. We describe the synthesis used to create these deuterated, protected amino acids.
Samantha Anna-Jane Moos and Brittany Marie Nelson (148)
Faculty Mentor/Collaborator: David E. Lewis
*Hydrolysis Studies of Vitamin K Analogues*

Our goal is to find an analog of Vitamin K that is a better and safer anticoagulant than the current drug, warfarin (Coumadin®). This is important because it is difficult to find a safe, stable and effective dose of warfarin. We have reported the synthesis of two esters with the potential to act as vitamin K analogues, and inhibit the vitamin K-dependent clotting cascade. One of these esters has shown unexpected activity when co-administered with warfarin to rats. The activity of the one highly active compound is confusing because at the beginning of the trial, it acts as a potent antagonist of warfarin anticoagulation, while later in the trial, using the same protocols, it becomes a potent enhancer of warfarin anticoagulation. As part of our work aimed at identifying the compounds responsible for both the anti-anticoagulant activity and the super-anticoagulant activity, we are carrying out hydrolysis of the esters under conditions that mimic the gastrointestinal environment in the animal. Our most recent results will be reported.

Alex James Nett, Sam J. Hein and Anne Alyse Fischer (122)
Faculty Mentor/Collaborator: Michael John Carney
*Transition Metal Complexes Incorporating Guanidine-Based Ligands for Ethylene Oligomerization*

Most commercial α-olefin processes produce a full product range (C4 – C20+ α-olefins). However, catalysts that selectively trimelize and tetramerize ethylene to 1-hexene and 1-octene, respectively, are becoming more prominent due to the higher commercial value of these α-olefin fractions. Selective catalysts are often chromium-based, such as Cr-pyrrole catalyst systems used in Chevron Phillips Chemical Company’s commercial process for 1-hexene. Other chromium complexes supported by multidentate ligands (e.g., PP, PNP, SNS) are also effective. We’ve continued our exploration of selective catalysts by supporting transition metals with multidentate imine-based ligands that incorporate additional donors. Our research includes the investigation of both amide and guanidine based ligand systems. Synthetic schemes will be presented for the ligands and for the resulting metal complexes. The activity of the metal complexes as ethylene oligomerization catalysts will also be presented.

Joel Gabriel Patrow (185)
Faculty Mentor/Collaborator: Bart J. Dahl
*The Synthesis and Halochromism of 6-Aryldibenzo[b,d]pyrylium Salts*

We are interested in a very rare class of oxygen-containing charged polycyclic aromatic hydrocarbons containing the 6-aryldibenzo[b,d]pyrylium moiety. This moiety is isomeric with the 9-aryldibenzo[b,e]pyrylium (xanthylum) unit, found in numerous important dyes, such as rhodamine. This unit is also a further benzannulated analog of the flavylum ion, found in many naturally occurring pigments, such as anthocyanins. We report the synthesis of several new 6-aryldibenzo[b,d]pyrylium salts as well as their reversible spectroscopic and optical character in varying pH environments (halochromism). Progress toward the synthesis and study of other analogs containing longer conjugation pathways will also be reported. Reversible disruption of conjugation, and thus intramolecular charge transfer, occurs upon addition of a nucleophile to these compounds and we are exploring the structures of these products as well.

Asia Marie Stephanie Riel (179)
Faculty Mentor/Collaborator: Bart J. Dahl
*Biphenyl and Terphenyl Lactone pH-Driven Molecular Switches*

The physical properties of biaryl-containing compounds are known to be highly dependent on molecular geometry. We have synthesized two 6H-benzo[c]chromen-6-one derivatives where a lactone “tether” between the two phenyl rings should force a planar geometry. Theses biphenyl lactones contain a methoxy electron donor and a nitro or cyano electron acceptor at the 4 and 4’ positions to affect charge transfer through the ring system. By varying the pH, we are able to reversibly and rapidly open and close the “tether” and thus switch the molecule in and out of planarity. The results of this pH-driven dihedral angle switching can be analyzed by UV-Vis and fluorescence spectroscopy. Progress toward analogous terphenyl derivatives with the capability to switch via both pH and redox reactions will also be reported.
Heidi Lynn Schmit (150)
Faculty Mentor/Collaborator: Sanchita Hati
Biochemical Studies to Probe the Domain-Domain Communication Pathways in *E. Coli* Prol-tRNA Synthetase

Aminoacyl-tRNA synthetases (AARSs) are a family of enzymes that catalyze the covalent attachment of amino acids to their corresponding transfer-RNA. These enzymes play critical roles in protein synthesis and viability. AARSs are comprised of many domains and each domain is responsible for carrying out a specific function for the attachment of correct amino acid onto tRNAs. Previous research studies have shown that the protein dynamics, especially correlated motion between residue pairs, play an important role in domain-domain communication in these enzymes. Recently, using molecular simulations and bioinformatics, we have traced several potential pathways of residue-residue interactions through which correlated motions could be propagated from one site to another and thereby help coordinate functions of various domains. We are presently probing those computationally determined pathways through experimental mutational studies. We are specifically focused on one enzyme of this family - prolyl-tRNA synthetases (ProRS), which attaches proline onto the tRNA\textsuperscript{Pro}. Currently, site-directed mutagenesis and kinetic studies are being carried out to study the role-specific mutations in the inter-domain communication and catalytic activity of this enzyme. Preliminary results of this study will be presented.

Ariel Elena Schuelke (212)
Faculty Mentor/Collaborator: Roslyn M. Theisen
Synthesis and Characterization of Flavothiones and Corresponding Metal Complexes for the use of Photodegradable Pesticides

In this study, we investigate the synthesis and characterization of new flavothiones and their related metal complexes to be used as photodegradable pesticides. Photodegradable pesticides are a promising solution to the problems posed by the use of synthetic chemicals in the environment. The goals for photodegradable pesticides are to be activated by sunlight, manage pests, and degrade into products that are environmentally safe under natural conditions. It was reported that 3-hydroxyflavothione (3-OHFT) is capable of killing bacterial and fungal species, and can degrade into products that can be removed from the environment over time. Although 3-OHFT corresponds with the characteristics for photopesticidal use, the lifetime is not long enough for practical use. A recent study was performed to react various metal salts with 3-OHFT to create metal complexes. The addition of a metal compound increased the lifetime of the complex. However, more investigation of this synthesis is still needed. In a one-step synthesis, we will synthesize flavothiones from commercially available flavones, specifically quercetin. New flavothionato metal complexes will be synthesized, characterized and the photodegradation will be investigated. We anticipate the thionated quercetin and related metal complexes to be activated by sunlight, kill bacterial and fungal species and to have a longer lifetime than the previous compound studied.

Nicholas John Sortedahl and Brian Timothy Meeuwsen (181)
Faculty Mentor/Collaborator: Bart J. Dahl
Progress Toward a Propeller-Shaped Oligophenyl Lactone with Reversible Geometry Switching

Planar conjugated organic molecules have unique spectroscopic and electronic properties. We are interested in molecules containing the 6H-benzo[c]chromen-6-one subunit because they should be both planar and conjugated, but should also readily switch their geometries in varying pH environments. We describe the progress toward a new organic-soluble propeller-shaped oligophenyl tri lactone with $C_{3h}$ symmetry. While planar under acidic conditions, the three lactone side rings are capable of opening under alkaline pH yielding two possible axial diastereomers containing three benzoate anions. The symmetric diastereomer should be preconfigured with the anionic benzoate groups on the same side of the central phenyl ring, and thus should be an excellent metal cation binding agent. We will describe the synthesis and spectroscopic properties of this molecule as well as progress toward the pH-driven switching studies.

Alexander Michael Strom and Yer Yang (119)
Faculty Mentor/Collaborators: Sudeep Bhattacharyay and Sanchita Hati
Comparison of Coarse-Grained and Atomistic-Level Simulations for Aminoacyl tRNA-Synthetases

Aminocacyl tRNA-synthetases (AARSs) are a group of multi-domain enzymes responsible for catalyzing the covalent attachment of an amino acid to its corresponding tRNA forming an aminoacyl-tRNA. These enzymes undergo notable large-scale motions which are associated with protein conformational changes as they fluctuate from their unbound inactive state to their bound active state. In this study, atomistic-level molecular dynamics (MD) simulations, coarse-grained MD simulations and normal mode analysis were conducted for comparison upon the enzymes *E. coli* MetRS, *E. faecium*
ProRS, and \textit{T. thermophilus} LeuRS. Atomistic-level MD simulations account for each and every atom using Newton’s second law (F=ma) to create a highly detailed representation of a molecule’s fluctuations but are computationally expensive. Coarse-grained simulations like normal mode analysis and coarse-grained MD simulations treat a molecule as an elastic mass-spring network of grouped atoms sacrificing detail but reducing processing demands thus saving time and financial resources. In this study, we present a comparison of the protein dynamics simulated by these three methods. By comparing thermal fluctuations, conformational overlap and correlated motion, this study will help gain insight into which computational method is most practical, in hopes of offering an accurate yet economical approach for studying dynamics of large, multi-domain proteins like aminoacyl tRNA-synthetases.

\textbf{Vladislav Suntsov (239)}  
Faculty Mentor/Collaborator: \textbf{David E. Lewis}  
\textit{Researcher and Revolutionary: Nikolai Matveevich Kizhner (1867-1935)}

Nikolai Matveevich Kizhner (1867-1935) was a Russian organic chemist whose name is permanently associated with the reaction that he discovered: the Wolff-Kishner reduction of carbonyl compounds. Up to now—except for a few short abstracts in English, in “Chemical Abstracts”—all his scientific work and biographical material about him has been in Russian. He studied under another eminent Russian organic chemist, Vladimir Vasil’evich Markovnikov (1838-1904) at Moscow University, and following his graduation with the Dr. Khimii (Dr. Chem.) degree, he moved east to the City of Tomsk, in Siberia. Here he became the inaugural Professor of Organic Chemistry at the Imperial Tomsk Technological Institute. During his first decade there, his right leg was amputated below the knee (1904) and his left leg six years later (1910). He organized student and faculty strikes against the Tsar’s government during the 1905 Revolution. In 1906, he was exiled from Tomsk with 48-hours’ notice to leave the city and the steppes region. In the tenth year of the decade, he published the work describing the reaction he had discovered (also discovered 18 months later by Ludwig Wolff at Jena, Germany). For this poster, new translations of Kizhner’s scientific work and biographical sketches have been prepared. We provide a brief synopsis of the career of this fascinating Russian organic chemist.

\textbf{Bonnie Thao (152)}  
Faculty Mentor/Collaborator: \textbf{Thao Yang}  
\textit{The Synthesis of Triazole Cyclic Mucin Peptides using Click-Chemistry and Peptide-Antibody Binding Study by NMR}

The project was to synthesize triazole ring containing cyclic mucin peptides and perform peptide-antibody binding study for these peptides, which were derived from the large transmembrane protein MUC1 mucin. The synthesis of linear GVTSPAD and two cyclic mucin peptides formed by a triazole ring, cyclo-azA-TSAPD-Pra-G and cyclo-azA-VTSAPD-Pra-G (azA = azidoalanine, Pra = propargylglycine), were carried out. The results of antibody binding study by the Saturation Transfer Difference NMR technique (STD-NMR) showed clear peaks corresponding to the methyl groups of alanine, threonine and valine. The proline side chain protons (\textit{P5Hβ}, \textit{P5Hγ}, \textit{P5Hα}) on the cyclo-azA-TSAPD-Pra-G showed significant saturation transfer effects, indicating stronger antibody interactions at these groups.

\textbf{Charles Thurber (123)}  
Faculty Mentor/Collaborator: \textbf{Kurt Wiegel}  
\textit{Supramolecular liquid crystalline polymers and networks: The incorporation of flexible networking agents on mesophase formation and stability}

Previous work on controlled theromreversible mesogenic networks has shown that there is a direct link between functionality of the crosslinking agent and the clearing compositions (minimum loading of crosslinking agent which destroys the mesophase). This report will involve the synthesis of crosslinking agents of multiple functionalities with the hydrogen bond acceptor being separated from the central atom by symmetric extended aliphatic chains. The effect of disconnecting the pyridine and the central carbon would likely be a combination of molecular freedom and depression of melting points bu eutectic mixtures. Additional work will include the separation of mesogen-forming rigid pyridines by extended ethylene oxy chains.

\textbf{Nicholas John Warren (149)}  
Faculty Mentor/Collaborator: \textbf{Sanchita Hati}  
\textit{Protein Dynamics of the Aminoacyl tRNA Synthetases}

The 20 aminoacyl tRNA synthetases (AARS) are responsible for the covalent attachment of amino acids to tRNA molecules to be used in protein synthesis. These enzymes play important roles in ensuring the correct translation of an mRNA
to protein. These 20 AARSs are grouped into two broad classes (class I and II) based on their structure and their interactions with tRNA molecule. As proteins dynamics have been proposed to play an important role in substrate binding and catalysis, we have been exploring the role of internal dynamics in the catalytic function of these enzymes. The AARSs are quite suitable to study because the molecular mechanism of how they carry out the catalytic reaction has been extensively studied and most of the 3-dimensional protein structures are known for AARSs. In the present study, we are specifically investigating if the two classes of AARS enzymes exhibit any distinct pattern of motions. Protein dynamics is studied by conducting computer simulations of protein 3-dimensional movement. We compared the movement of protein domains of 20 AARSs and related that movement to the existing classification of AARSs based on 3D structure. The preliminary results of this study will be presented.

Yer Yang and Caitlin Gibson Bresnahan (121)
Faculty Mentor/Collaborator: Sudeep Bhattacharyya

Quantum Chemical Studies of the Binding and Catalytic Hydride Transfer Reaction of Flavin with Aromatic Substrates

A large number of chemical reactions are catalyzed by flavoenzymes - a group of enzymes that utilizes flavin ring as a cofactor. The versatility arises mainly due to the ability of enzyme matrix to modulate flavin’s redox potentials by altering non-covalent interactions. These interactions include hydrogen bonding with flavin ring atoms, hydrophobic interactions due to aromatic side chains, and p-p stacking interactions with aromatic substrates (e.g. quinone reductases). Although recent theoretical studies were successful in modeling hydrogen bonding interactions,1-2 the effects of aromatic interactions on the redox properties of flavins have remained only partially revealed. The difficulty in modeling these interactions arises because of limitations in various theoretical treatments to reproduce van der Waal’s interactions. In the present study, the p-p stacking interactions of flavin and other aromatic molecules have been studied using improved semi-empirical and density functional theories. In particular, the capability of describing the redox reaction with one of its most common substrates, 1-methyl nicotinamide, have been analyzed for a distinct comparison with experimental results. The effect of these aromatic interactions on binding as well as catalysis will be presented.

GEOGRAPHY AND ANTHROPOLOGY

Joel Michael Albrecht (173)
Faculty Mentor/Collaborator: Cyril O. Wilson

Land Use/Land Cover Changes in the Lower Chippewa River Watershed

Changes in land use/land cover (LULC) have become increasingly apparent in urban and urban/rural fringes over the past few decades. This also applies locally, as this study involves LULC changes in the Lower Chippewa River watershed in decadal intervals from 1990-2010. This is a vital component of a broader project involving hydrologic/water quality modeling of the same study area. Using various remote sensing techniques, satellite imagery was geo-referenced, mosaicked, and then classified into appropriate LULC classes. Image classification involved two user intensive approaches: Unsupervised Classification (ISODATA) as well as Linear Spectral Unmixing to produce the initial classified images. After basic classification, Advanced Classification was employed in order to increase the accuracy and detail of classification. The LULC classes generated in this project are as follows: Water, Forest, Agriculture, Grass/Low Shrub Range, High Density Residential, Low Density Residential, Commercial, Industrial, and Institutional. Results of the study reveals significant changes in the structure and composition of certain LULC.

Arik Lee Arnevik (109)
Faculty Mentor/Collaborator: Harry M. Jol

Preliminary Results of a Ground Penetrating Radar Survey on an Aeolian Dune: Implications of Climate Change for Northeast Michigan, USA

Ground penetrating radar (GPR) was used in the investigation of an interior (non-coastal) aeolian (wind-blown) sand dune. The study area lies in the Huron Mountains, located in the eastern region of Northern Michigan about 60 km northwest of Marquette. The specific study location is approximately 2-3 km southwest of Ives Lake. Four GPR transects were run in a grid across the dune. The pulseEKKO 100 and 1000 GPR systems using antennae frequencies of 100, 200, and 450 MHz were used to investigate the dune’s subsurface layering. Laser leveling was used throughout the length of each GPR transect in order to topographically correct the profiles for elevation change. Through the preliminary interpretation of the processed GPR reflection profiles of the subsurface stratigraphy the feature can be more thoroughly interpreted.
as an aeolian dune. With the stratigraphy revealed by GPR and previous research suggesting the dune to be Holocene (ca. 10,000 to 8,000 years old) in age along with the inherent criteria necessary for dune formation (wind, sand, and low amounts of vegetation cover) one can hypothesize that climate change, significant enough to alter the landscape from being conducive to dune formation to being fully forested, affected this area of Northern Michigan during the Holocene.

Jackson Jae Becker, Joseph Anthony Quintana, Joanne Chen, and Arik Lee Arnevik (138)
Faculty Mentor/Collaborators: Harry M. Jol and Martin P. Goettl
External Collaborators: Mitch Craig, California State University-East Bay, and Joanne Chen, California State University-East Bay

Geospatial Investigation of Fort Ord Dunes State Park: 3. Ground Penetrating Radar Assessment

The recently developed Fort Ord Dunes State Park, located north of Monterey Bay, California, has a coastal dune complex along with an abandoned military base. To better understand the internal stratigraphy of this dune complex and assess the cultural impacts of the abandoned base, a field investigation using a ground penetrating radar (GPR) survey was undertaken along the present dune apex. A pulseEKKO 100 GPR system with 100 MHz and 200 MHz antennae frequencies and a 1000v transmitter was used along a 200m transect with 0.5 m stepped intervals. A common midpoint survey was collected to determine a velocity of 0.1 m/ns, from which a depth of 20 m penetration was determined. The collected information was topographically corrected using global positioning system (GPS) elevation data taken along the transect. The GPR data showed the horizontal to sub horizontal, semi-continuous layers of the dune that are interpreted as an aggrading dune. The reflection patterns also show three distinct hyperbolic arches, which are interpreted as concrete bunkers within the subsurface. Through the use of GPR, our field study demonstrates an effective methodology to map both the physical and cultural impacts as part of a more comprehensive study to aid in future park planning.

Laurel Alyce Hanson (187)
Faculty Mentor/Collaborator: Martin P. Goettl

Developing Geospatial Connections: Collaborative Mentoring between UWEC Geography, Wildlands School and Beaver Creek Reserve

This multi-dimensional project had two specific goals. The first goal was to develop a collaboration between UW-Eau Claire Department of Geography and Anthropology, Wildlands School, and Beaver Creek Reserve in order to advance geospatial knowledge for the students by developing geographic data for Beaver Creek Reserve. The second goal was to create a blueprint for future K-12 geospatial collaborations. This project introduces K-12 educators and students to geospatial technology and its classroom uses. This collaboration provided technology, resources, and support through communication and team building in an innovative setting through project-based, real world experience. The approach consisted of a continuous cycle of educating, planning, and implementing the geospatial tools and data. Students learned geodatabase management, data collection, and mapping applications. Students collected data in a hands-on approach and uploaded the data to a GIS (Geospatial Information System) to create physical maps for Beaver Creek Reserve. The process was documented throughout its entirety. Although the project is still in progress, there are two expected outcomes. The first is the creation of physical maps for Beaver Creek Reserve produced by the Wildlands students with assistance from the UW-Eau Claire Geography and Anthropology Department. The second is a blueprint for future K-12 geospatial collaborations.

Sean Michael Morrison, Lauren Elizabeth Roeglin, and Matthew William Struve (132)
Faculty Mentor/Collaborators: Harry M. Jol, Garry Leonard Running, and Douglas J. Faulkner

Incision and Lateral Migration along Terraces of the Lower Chippewa River Valley, Wi, USA: A GPR Investigation of a 4-5 m Thick Braid Deposit

The Lower Chippewa River Valley (LCRV) in west-central Wisconsin has numerous terraces which were formed by episodes of incision. The study seeks to determine the extent to which a unique sedimentary pattern exists spatially, both up and downstream as well as from oldest to youngest terraces. Earlier research on the LCRV terraces using ground penetrating radar (GPR) resulted in images that were interpreted to show two sedimentological units divided by a well-defined boundary at a depth of 4-5 meters. The lower unit has reflection patterns that are semi-continuous to discontinuous and vary between sub-horizontal, undulating and inclined. The upper unit has reflection patterns that are semi-continuous, horizontal to sub-horizontal. Core samples showed that the lower unit is made up of sand and gravel deposits related to late Wisconsinan glacio-fluvial processes, whereas the upper unit consists of dominantly sandy sediments that are related to incision and lateral migration of a braid-like Chippewa River. Based on earlier research, previously collected GPR profiles within the LCRV were reprocessed, re-plotted, and re-interpreted. The results demonstrate that a 4-5 m thick sandy
sedimentary pattern extends throughout the LCRV.

**Ben James Possi (172)**  
Faculty Mentor/Collaborator: Cyril O. Wilson  
*Geospatial and Socioeconomic Analysis of Residential Heat Loss in Milwaukee*

Currently, Milwaukee remains the most heavily segregated city in the United States, according to a report by the Brookings Institution (Frey 2010). Seeking affordable housing and access to public transportation, many of the city’s low-income and minority residents commonly reside in the zone of discard, where blighted buildings and vacant homes fill the landscape. As such, many inhabitants are afflicted by rooftop heat loss, a phenomenon in which heat escapes through the roofs of poorly insulated homes. In an effort to invoke further sustainability initiatives, midwinter satellite imagery is used in conjunction with several remote sensing techniques to assess where the residential heat loss has relationship with the city’s socioeconomic stratification. After processing and extracting remotely sensed temperature data at the census tract level, multivariate regression analysis is performed to determine the statistical relationships between temperature and a variety of socioeconomic variables, such as home value and median income. Here, the expectation is that the city’s underprivileged residents are the most affected by residential heat loss.

**Phillip Paul Rynish (92)**  
Faculty Mentor/Collaborator: Sean Hartnett  
*Bathymetric Mapping of Pine Lake – Employing New Technologies*

Bathymetric mapping is not a new field, but new technologies are constantly emerging and making the process easier and quicker. In this study, a new generation of Lowrance SD digital sounders was used to collect data on Pine Lake in New Auburn, Wisconsin. This replaced the older “Gameboy” method that had been used in the past. Two 3D lake maps were generated. One utilized cloud-based geoprocessing by ciBioBase and the Kriging method associated with it; while the other was made with the more traditional ArcGIS TIN and GRID method. A comparison of the two investigates overall quality, ease of use, and the history behind each of the methods.

**Anthony Kenneth Sigrist (108)**  
Faculty Mentor/Collaborator: Christina M. Hupy  
*Landscape Dynamics of Oak-Savanna in the Lower Chippewa River Valley, Wisconsin*

The overall goal of this research was to better understand the drivers of oak (Quercus) savanna establishment and maintenance in the Lower Chippewa River Valley, WI. The study site for the research is the Caryville Savanna in Dunn County, WI. Dendrochronological methods and tree mapping were employed in order to investigate tree age and landscape position. Twelve plots were established at the site and, in four of the plots, tree age data were collected using standard dendrochronological methods. Age data were collected for 105 trees. The oldest tree was dated to 1826 at 185 years old. At the other 8 plots each tree location was marked with a GPS points. The locational data for trees on the island was plotted in ArcGIS. The GPS locations were overlain with a digital terrain model generated from LiDAR data. In total, 610 or 89% of trees were on a meander scroll, and 76 or 11% of the 686 tree locations were found on a meander swale. The preliminary data suggest that fluvial geomorphology plays a key role in oak savanna establishment on the Caryville Savanna. These data will be analyzed further to better understand the landscape drivers of oak savanna.

**David Lloyd Simenson, Matthew Timothy Drahnak, Jessica Teresa Stodola, and Joseph Eric Reber (163)**  
Faculty Mentor/Collaborators: Harry M. Jol and Martin P. Goettl  
External Collaborators: Mitchell Craig, California State University-East Bay, and Joann Chan, California State University, East Bay  
*Geospatial Investigation of Fort Ord Dunes State Park: 2. GIS/GPS Applications*

The recently developed Fort Ord Dunes State Park north of Monterey, California comprises an eroding coastal dune complex. The project used several geospatial technologies to delineate the internal stratigraphy of the dunes and assess the cultural impacts of the abandoned military base. In conjunction with ground penetrating radar (GPR), geospatial tools such as global positioning systems (GPS) and geospatial information systems (GIS) were used. GPS units with varying degrees of resolution mapped the location of the GPR transects and buried ammunition bunkers. Equipment used with increasing accuracy include the Garmin e-trex (<15m), Trimble Juno 3B (3-5m), and real time kinematic Magellan ProMark 3 with base station (1cm). Through ESRI GIS software, collected points and datasets allow the data to be compared with real world variables, such as elevation, slope, and vegetation. ESRI ArcMap assisted with determining accuracy differ-
ences between GPS devices (15m to sub-meter resolution) and locating bunker interferences in GPR data. Additionally, ESRI ArcScene enabled placement of publicly available satellite imagery over digital elevation models to visualize the topography of the coastal dune complex in 3D. The study resulted in a map and visualization of the surface and subsurface landscape, which will aid in future park planning.

Samuel Peter Tompsett, Arik Lee Arnevik, Andrea Lynn Holm, Lauren Elizabeth Roeglin, and Ryan Christopher Alger (241)

Faculty Mentor/Collaborator: Garry Leonard Running

Soils and Best Landuse: A Tale of Soil Erosion Susceptibility and Suggestions for Mitigation from the University of Wisconsin-Eau Claire's Children’s Nature Academy, West-central Wisconsin

In 2011 the UW-Eau Claire Foundation purchased the 112 acre St. Bede’s Priory property south of Eau Claire, WI that currently houses the Children’s Nature Academy (CNA). The study area is located on a sandstone bedrock controlled ridge top bounded by steep, wooded, convex slopes grading to gently sloping valleys. The purpose of our research is to use soil-based evidence to inform best land use practices for the property. Five soil profiles in the ridge top and two in the valley were excavated, described, and photographed using Natural Resource Conservation Service methods. Ridge top soils are thin (<35 cm) severely erosion-prone loess-derived silt loam. Evidence of soil erosion is ubiquitous. Extensive areas of ridge top soils are eroded to the subsoil. In other places sandstone bedrock is exposed at the surface. Bare, eroding soils are already widespread in the play areas at CNA. Soils on slopes are thin reworked loess over sandstone, in some cases welded to much better developed profiles. Downslope such soils interfinger with soils formed in bedrock-derived sandy alluvium. We recommend land use be restricted to low impact activities that help control soil erosion or, alternatively, that steps be taken to mitigate for soil erosion.

Lauren Elizabeth Roeglin (230)

Faculty Mentor/Collaborator: Garry Leonard Running

External Collaborators: Seth King, University of Wisconsin-La Crosse, and Constance Arzigian, University of Wisconsin-La Crosse

Analysis of Clay Mineralogy of Oneota Pottery Using XRD

In 2010, research was initiated to investigate the mineralogical relationship between Oneota pottery from three major archaeological sites in La Crosse, Wisconsin and local clays within the Upper Mississippi River Valley. Determining the local source of clay used to make different styles of Oneota pottery from the three archaeological sites gives insight into the development of Oneota culture within the La Crosse locality. A total of 14 pottery samples were collected and analyzed by x-ray diffraction (XRD) to determine their mineralogical composition. The XRD patterns obtained from these samples were compared to those obtained from local clay sources. One known local clay source, sharing a similar mineral composition with numerous samples, is identified as part of the Savanna Terrace formation, a late Wisconsinan glacio-fluvial terrace. The Savanna Terrace has been mapped along the Mississippi River and its tributaries, extending from Pepin, Wisconsin to Jackson, Illinois. The Savanna Terrace is also present within the American Bottom (the central home of the Mississippian culture) with mineral composition of clays in this region being slightly different. This provides an opportunity to compare the mineralogy of pottery between Oneota and Mississippian cultures and consider cultural interactions, such as trade, at a larger scale.

Mary Frances Tubbs Beaudette, Tianran Gao, and Meghan Anne Kelly (139)

Faculty Mentor/Collaborators: Harry M. Jol and Martin P. Goettl

External Collaborators: Mitchell Craig, California State University- East Bay, and Joann Chan, California State University- East Bay

Geospatial Investigation of Fort Ord Dunes State Park: Cultural and Physical Background

The Fort Ord military training facility in Monterey Bay, California was closed in 1994. A 6.4km section within the former base was designated as Fort Ord Dunes State Park in 2009. The focus of the study was to investigate the internal stratigraphy of the coastal dune complex and the cultural impacts of the abandoned military base. Field observations of a 48m thick eroding coastal outcrop showed three sedimentary dune packages. The three packages were separated by two erosional unconformities measured at depths of 18.75m and 30.25m, each topped with a buried soil horizon. The coastal dune complex was embedded with twelve abandoned military ammunition bunkers. Using a global positioning system (Trimble Juno 3B), the observed average length (15.2m) and average width (3.3m) of the bunkers were recorded. A 200m transect across the apex of the dune complex revealed ice plant (Carpobrotus edulis) which covered 86.3% of the dunes. Ice plant is a non-native species that was planted by the military during the 1940s to stabilize the dunes and has become invasive,
outcompeting native vegetation. The geospatial investigation provides insight into the physical and cultural landscape of Fort Ord Dunes State Park, which will aid in the park’s continued development.

Nathaniel Scott Wick and Samuel Adams Krueger (133)
Faculty Mentor/Collaborator: Douglas J. Faulkner
A Detailed Long Profile of the Lower Chippewa River: Evidence of Ongoing Episodic Incision

During the Late Wisconsin ice age, the Lower Chippewa River (LCR) served as an important meltwater stream and aggraded, partially filling its valley with glacial outwash. Subsequently the river incised into the outwash forming a series of terraces, of which the Wissota Terrace is the highest (home of UW-Eau Claire upper campus). Irregularities on a long profile constructed from 1:24,000 topographic maps suggest that episodic incision is still occurring along the LCR thousands of years after it began (a long profile shows change in elevation over the distance of the river). We had doubts as to whether these irregularities existed or were the result of topographic map error. Even small errors could cause irregularities, as the LCR drops only approximately 10 meters over 100km (Dells Dam to its confluence with the Mississippi River). Utilizing a total station (high precision survey equipment) we collected water surface elevation points to create a highly detailed long profile of the LCR. This long profile confirms the presence of irregularities seen in the long profile constructed from the topographic maps and supports our hypothesis that episodic incision is still occurring today.

GEOLOGY

Ellen Katherine Buelow and Xai Her (168)
Faculty Mentor/Collaborator: Scott K. Clark
Scientists as Media Resources in the Aftermath of Disasters: Trends Following two Devastating Tsunamis
In the aftermath of a natural disaster, scientists are a critical component in the media’s efforts to educate and inform the public. Using the LexisNexis® database of news articles, we analyzed trends in the types of information that the media obtained from scientists during the week after the 2004 Indian Ocean tsunami and the week after the 2011 Japan tsunami. Scientist-referenced articles peaked on the third day following the 2004 event. In most articles, scientists explained what a tsunami is and the reason for why it occurred. Although the overall number of articles containing scientific input waned as the week progressed, the media continued to seek scientists’ input on the broad topic of tsunamis; later articles focused on plate tectonics and the global distribution of other tsunami-prone areas. Comparing trends in the 2004 tsunami data to our on-going analysis of the 2011 tsunami will allow us to test our hypothesis that there has been a shift in the information sought from scientists. We predict that massive coverage of the 2004 tsunami increased the tsunami-related knowledge of the media and the general public. If true, the 2011 data should show a significant decrease in articles that provide basic scientific information.

Franklin L. Heaton (170)
Faculty Mentor/Collaborator: J. Brian Mahoney
Sediment Geochemistry of Petroleum Source Rocks: A Potential Exploration Tool

Over the past few decades, oil companies began exploring and utilizing new methods of obtaining petroleum and natural gas. One such method of obtaining these resources is through hydraulic fracture of shale units in various layers of the rock. The Eagleford shale of southern Texas is a unit that is currently being targeted for natural gas and oil. When examining the data from drilling logs, there are clear spikes in oil and natural gas within the stratigraphic sequence of the Eagleford formation which should also be seen through the geochemical signature. Through examining samples from various depths, we tested to see how the geochemical data aligned with the spikes of natural gas and oil in stratigraphic sequence. Detailed sediment geochemistry data is being used to determine whether there is a correlation between the geochemical variation with shale units and the location of natural gas and oil. The increased presence of sodium, iron, vanadium, rubidium, aluminum and magnesium parallel gas spikes stratigraphically.

Xai Her and Brian Christopher Nehring (192)
Faculty Mentor/Collaborator: J. Brian Mahoney
Geochemical Analysis of Nicaragua’s Volcanism in Comparison to Contiguous Volcanos in the Central American Arc

Central America’s volcanism initiated approximately 10 Ma with the most recent magmatic pulse building the modern volcanic arc over the last 600 Ka. The volcanic history of the area is episodic with each period displaying distinct geochemistry that can be used to interpret past and present tectonic settings. Previous geochemical analyses of the modern arc present low values of REE’s and high values of Ba/La, U/Th, and Ba/Th in Nicaragua. In contrast, to both the north
(Honduras) and south (Costa Rica) of Nicaragua there are decreasing values of Ba/La, U/Th, and Ba/Th ratios and increasing values of REE’s, indicative of lower degrees of partial melting of source materials. In this study, we examine the variability in the modern arc system by sampling rocks from six active volcanoes during a one week field excursion in western Nicaragua. Whole rock geochemistry is used to compare the modern volcanic arc with previous geochemical results (REE’s, Ba/La, U/Th, and Ba/Th ratios) from Guatemala, El Salvador, and Costa Rica. This research will add to the knowledge of volcanic arc systems, and more specifically, improve the current understanding of the complex geology of Central America.

Xai Her and Ellen Katherine Buelow (193)
Faculty Mentor/Collaborator: Scott K. Clark
The Role of Proximity in How Individuals Describe Natural Disasters: Analysis of the 2004 Indian Ocean Tsunami

What words do people use to describe a disaster? Does proximity to a disaster affect word choice in how people describe the event? We collected and analyzed 170 quotations from U.S. newspaper and wire service articles that mentioned either ‘tidal wave’ or ‘tsunami’ in the week following the 2004 Indian Ocean tsunami. More than half (56%) of the quotations from individuals who were situated near the impacted area described the event as a ‘tidal wave’. This contrasts with individuals not located near the area, who nearly unanimously (98%) used ‘tsunami.’ We interpret these statistically significant differences to indicate that people who had a proximal, visceral disaster experience used language that focused on what they specifically experienced: a devastating wave. The trauma of the experience also likely led people to rely on words with which they are most familiar, unlike individuals situated at a distance who used the scientifically correct and potentially less emotional term, tsunami. Our analysis will contribute to the growing body of literature on how a person’s proximity to a disaster can influence their subsequent behavior. These findings can help the media, disaster relief personnel, and scientists to better prepare disaster-awareness education and communication efforts.

Lindsey Ann Lepak (191)
Faculty Mentor/Collaborator: J. Brian Mahoney
External Collaborator: Beth Wenell, University of Minnesota
Chemical Weathering in Heterogeneous Bedrock

Chemical weathering is a natural process that disintegrates rock and supplies solutes and nutrients for plant uptake and the hydrologic cycle. The extent of chemical weathering is assessed using a geochemical mass balance model (Brimhall & Dietrich, 1986). The mass balance model depends on selecting unweathered parent material to compare for element mobility. This study compares 21 m deep rotosonic drill cores and outcrop samples to characterize parent material and evaluate bedrock variability. These data are used to select appropriate immobile elements for mass balance calculations. Drill cores were sampled both on ridges and in gullies within a 9-hectare, first-order watershed located in a forested nature preserve in the Piedmont coastal plain of southeastern Pennsylvania. Preliminary data from drill cores suggest that the bedrock has variable concentrations of zirconium, one of the most common immobile elements for geochemical mass balance calculations. This study explores several options for assigning composition of unweathered parent material to assess chemical weathering in heterogeneous bedrock.

Todd Andrew Lindblad, Scott Alan Wipperfurth, and Aleisha Christine Johnson (220)
Faculty Mentor/Collaborator: Phillip D. Ihinger
Chemical Fingerprint of Quartz Crystals Sampled at Windgällenhütte, Switzerland

The spatial distribution of chemical impurities in hydrothermal quartz crystals documents the evolution of their host hydrothermal fluids and offers potential insights into their post-crystallization thermal histories. Four distinct temperature regimes have been identified across the Swiss Alps by Mullis and colleagues (1994; 2009), and offer an ideal setting for examining the effect of external variables on the uptake of hydrous impurities in vein quartz. We present infrared spectroscopic analyses on a series of crystals extracted from a single vein from Windgällenhütte, Switzerland, located in the Aar massif as identified in Mullis et al. (1994). The concentrations of hydroxyl-bearing species, including LiOH, AlOH, and molecular water, have been measured using micro-FTIR spectroscopy along detailed traverses across 1-mm thick crystal wafers. Our results show pronounced diffusion profiles documenting post- and syn-crystallization diffusive loss from the edges of all crystals. Compared to quartz crystals from other localities from the Swiss Alps, our measurements from the cores of Windgällenhütte crystals show elevated concentrations in molecular water and AlOH, with correspondingly low LiOH abundances.
Obsidian glasses preserve textural evidence that multiple cycles of fragmentation and annealing occurred within magmatic conduits prior to eruption. The nature and timescales of these processes are poorly understood. Dissolved volatile concentrations provide valuable insights into eruption dynamics, as solubility and speciation are sensitive indicators to changing pressures and temperatures. Recently, Watkins et al. (2012) postulated a ‘bubble geobarometry’ technique utilizing water diffusion profiles around vesicles in obsidian fragments collected from tephra deposits of Mono Craters, California. They suggested that the gradients in water content were the product of volatile resorption following pressure increases of 5-30 MPa prior to eruption. To test this intriguing hypothesis, we present infrared spectroscopic measurements of dissolved water and carbon dioxide contents in Mono Craters obsidian fragments. The relative abundance of the two dissolved water species (hydroxyl and molecular water) measured in silicate glasses is a direct function of the total water content and the cooling rate of the melt. Hydration occurring at temperatures below the glass transition can thus be readily identified. We examine the variation in abundance of hydroxyl and molecular water species along hydration gradients near large vesicles to determine whether hydration occurred at magmatic or sub-magmatic temperatures.

Industrial sand mining has been expanding rapidly in western Wisconsin, thus increasing concerns about silicosis, a respiratory disease caused by inhaling silica dust. Most respirable dust (PM2.5) is likely from the sandstone cement. The purpose of this study is to determine the cement mineralogy for “frac” sand units in Wisconsin. Sandstone samples collected in western Wisconsin have been cut, impregnated with epoxy, made into polished thin sections, and then examined using a petrographic microscope. Standard point counting and photomicrograph techniques have been used to determine the mineralogy and relative percentages of the grains, cement, and voids. Qualitative observations reveal potassium feldspar [K-spar], hematite, and quartz cements. Mount Simon Fm. sandstone contains large amounts of hematite and K-spar cement. Wonewoc Fm. contains abundant hematite and K-spar throughout the formation. Jordan Fm. cements differ markedly. Some rocks are primarily cemented by calcite or quartz. St. Peter sandstone has polycrystalline quartz grains rimmed with minor amounts of hematite and K-spar. A more extensive suite of samples is being point counted. The relative abundance of K-spar and hematite cements should reduce the concentration of crystalline silica in the respirable dust fraction. Also, multiple generations of cement and high porosity values suggest repetitive cycles of cementation and diageneis.

Nicaragua is the largest country in Central America and has a rich geologic history related to gold exploration and mining dating back to the 16th century. More recent geologic interest in Nicaragua stems from its plate tectonic setting that consists of active subduction of the Cocos plate beneath the Caribbean plate along its western margin. Active volcanoes of the Central American Volcanic arc are a result of this subduction. In addition, the forearc region is seismically active along its length with major right lateral strike slip faulting likely accommodating arc parallel displacement. Nicaragua is a premiere location to complete a transect across an active volcanic arc and investigate geologic aspects of the arc in concert with the cultural, societal and economic impacts of living in a tectonically active region. At present the geologic evolution of the arc and forearc regions is poorly understood. Samples and data will be collected during a spring break excursion from the forearc region, through the arc and into the backarc carbonate platform. These structural, sedimentologic and geochemical data will help elucidate the geologic and tectonic evolution of this active arc system.

The Prairie du Chien group in western Wisconsin and eastern Minnesota is a large supplier of dimension stone. The durability of these blocks allows them to be used in a wide variety of applications from small garden steps to large building stones. There are several different stratigraphic intervals in the Oneota Formation that are ideal for dimension stone, and
identifying these intervals would increase the production of stone in the Prairie du Chien region. Detailed stratigraphic analyses of the Oneota Formation in Winona, Minnesota are used to determine zones of stratigraphic intervals of economic importance. The Oneota Formation is a cliff forming sandy dolomite that forms the bluffs along the Mississippi River. Petrologic and geochemical analyses have been conducted to determine the vug density and sand content. These data are essential in dividing the group into separate members and determining the lateral and vertical variations within members.

Samantha Sue Taylor and Rebecca Jean Moore (160)
Faculty Mentor/Collaborator: J. Brian Mahoney
Stratigraphic and Structural Analysis of the Phosphoria Formation, Southeast Idaho

The Permian Phosphoria Formation in SE Idaho is the primary source of phosphate in North America. Phosphate is a primarily used in fertilizers, but can also be found in various foods and beverages, which makes phosphate a vital commodity. Documentation of the stratigraphic character and structural deformation of the Phosphoria Formation is required in order to evaluate the economic potential of the unit. Geologic mapping of the Phosphoria Formation in southeast Idaho has defined a north-plunging, nearly isoclinal anticline with a strike distance of nearly 15km in the hanging wall of the Meade Thrust. This anticline involves three geologic formations, including the Pennsylvanian-Permian Wells Formation, Permian Phosphoria Formation, and the Triassic Dinwoody Formation. Structural analysis indicates that the Phosphoria Formation has been dramatically thickened and thinned by flexural slip during deformation.

Samantha Sue Taylor, Brian Christopher Nehring, Amy Kathleen Rasmussen, and Rebecca Jean Moore (161)
Faculty Mentor/Collaborators: J. Brian Mahoney and Geoffrey S. Pignotta
Basal Cambrian Stratigraphy in Western Montana, Evidence of Pre-Cambrian Uplift?

Geologic mapping of the Blowout Mountain 7.5’ Quadrangle under the auspices of the USGS EDMAP program focuses on the Proterozoic/Cambrian transition. In this area, stratigraphic relationships between the Mesoproterozoic Belt Supergroup and Middle Cambrian Flathead Sandstone constrain the nature of the sub-Cambrian paleosurface. Stratigraphic studies demonstrate the unconformable relationship between the Flathead Sandstone and both the Ravalli Group (lower Belt) and the Missoula Group (upper Belt). The Flathead Sandstone is a very coarse sandstone to granule conglomerate with abundant trough cross stratification and ichnofauna, including Rusophycus, that suggests shallow water deposition in the upper shoreface. Deposition of the Flathead Sandstone on a slight angular unconformity on top of both the upper and lower Belt strata requires uplift and erosion of the Belt Supergroup prior to middle Cambrian time. The mechanism responsible for uplift of this magnitude without substantial deformation in the Belt Supergroup prior to Cambrian time is enigmatic. Evidence of uplift and erosion in the Belt Supergroup in this area contrasts strongly with the stratigraphic relationship within the Helena Salient, where the Missoula Group was apparently not deposited and the Flathead Sandstone sits disconformably on undeformed lower Belt strata.

Scott Alan Wipperfurth, Aleisha Christine Johnson, and Todd Andrew Lindblad (200)
Faculty Mentor/Collaborator: Phillip D. Ihinger
Chemical Fingerprint of Quartz Crystals Sampled Across the Lepontine Zone in the Swiss Alps

Quartz crystals record the evolution of hydrothermal fluid systems that accompanied the uplift of the Swiss Alps. Crystals from twenty localities were collected along a geologic traverse across four distinct temperature regimes that define the Alpine Mountain Range. Spectroscopic measurements reveal the changing fluid compositions, crystal growth timescales, and post-crystallization thermal histories characteristic of each regime. We present results on crystals extracted from the high temperature hydrothermal veins of the Lepontine Zone, representing the southern portion of the Alpine traverse. Individual crystals were sectioned into 1 mm thick wafers cut perpendicular to the c-axis for micro-infrared spectroscopic study. Initial investigations demonstrate relatively high trace hydroxyl concentrations compared to hydrothermal quartz elsewhere in the Alpine traverse, with AlOH abundances generally twice as large as LiOH and molecular water. Concentration profiles are observed near the edges of crystals and show diffusive loss of all three hydroxyl species.

GEOLOGY AND BIOLOGY

Joel Harrison Smith (169)
Faculty Mentor/Collaborators: Scott K. Clark and Deborah Ann Freund
Multi-method Analysis for Expansion of Public Outreach at Charles Darwin Research Station, Galapagos Islands

The Charles Darwin Foundation (CDF) conducts research for the conservation of the Galapagos and manages the Charles
Darwin Research Station (CDRS). Due to multiple factors, the CDF has recently experienced a financial crisis. We investigated the CDRS to provide recommendations for stabilizing finances through public outreach. In an attempt to assist the CDF in refocusing its outreach direction we undertook a multi-method study to gauge tourists’ understanding of the CDF’s mission, research projects, and outreach efforts. During 2012, we assessed current outreach activities, conducted a one-week-long trial outreach program, and collected quantitative and qualitative survey data. In January, 2013, we interviewed selected staff and scientists to obtain their insights on factors surrounding public outreach at CDF. We obtained CDF Facebook statistics to analysis the impact of social networking. Our findings indicate that the public outreach program has been in decline since 2007. The CDF has not invested significantly in its fundraising capacity, and has missed numerous opportunities both in the Galapagos and online. We recommend that the CDF adopt a set of nested actions to improve financial stability through public outreach: expand its internet presence and improve on-site public communication efforts, including establishing on-site interpretation and guide programs.

GEOLOGY AND MATERIALS SCIENCE CENTER
Scott Alan Wipperfurth (201)
Faculty Mentor/Collaborators: Phillip D. Ihinger and Jill W. Ferguson
A New Sample Preparation Technique for Measuring REE Abundances in Carbonate-rich Silicate Rocks: Safer, Faster, Cheaper

We present results that test the efficacy of a newly designed sample preparation technique for measuring Rare Earth Elements (REE) in silicate rocks. Our study utilizes a safer, faster, and cheaper method of sample digestion compared to conventional methods that employ hydrofluoric acid in pressurized bombs. Our technique involves a two-stage desktop dissolution of rock powders in a mixture of hydrochloric and nitric acids. Studies suggest that REEs in alkalic igneous rocks are predominantly concentrated in carbonate minerals within their host silicate rock. HCl and HNO₃ readily dissolve carbonate minerals releasing the vast majority of whole-rock REEs. In contrast, REE contained in adjacent silicate phases are released at slower rates, and can potentially result in differential fractionation of REEs on extraction. Our preliminary results on Cretaceous lamprophyres sampled from New England suggest LREEs are preferentially removed at faster rates than HREEs. Further studies are required to quantify this phenomenon and confirm the accuracy and viability of our revised method.

MATERIALS SCIENCE CENTER
Patrick James Baker, Austin Richard Bol, and Dylan Gary Karis (246)
Faculty Mentor/Collaborator: Elizabeth M. Glogowski
Synthesis, Functionalization and Characterization Methods of Poly(2-(dimethylamino)ethyl methacrylate)

Certain polymers can exhibit “smart” behavior by responding to environmental changes or stimuli such as pH, temperature, or ionic strength. Poly(2-(dimethylamino)ethyl methacrylate) (PDMAEMA) is a “smart” polymer that is water-soluble at room temperature and becomes water-insoluble upon heating above its critical temperature. Complex structures allow for better control of the “smart” stimuli responsiveness. Atom Transfer Radical Polymerization (ATRP) is a polymerization method that yields control over polymer structure, including molecular weight, molecular weight distribution, and polymer architecture which allows for fine tuning of the stimuli responsive behavior. PDMAEMA was synthesized using ATRP, and additional chemistry was used to alter the functionality of polymer chains. Characterization of PDMAEMA was performed using Nuclear Magnetic Resonance spectroscopy, Gel Permeation Chromatography, Matrix Assisted Laser Desorption Ionization Time of Flight Mass Spectrometry, and end group functionalization using amide formation to determine absolute molecular weight. PDMAEMA comb polymers can aggregate into micelles or polymer liposomes, which have potential applications in cosmetics, encapsulation and controlled release of drugs, and other biological uses.

Daniel Adam Decato and Anneliese Emma Laskowski (248)
Faculty Mentor/Collaborator: Jennifer A. Dahl
Microwave-assisted Synthesis of Triangular Silver Nanoplates: Influence of Seed Clusters

Silver nanoparticles were produced by an aqueous synthesis using a variable frequency microwave reactor system, where silver nitrate is reduced by polyvinylpyrrolidone, with no other reagent present. Here, microwave-assisted synthesis reduces reaction time significantly (from days to minutes) compared to conventional heating methods, even if the nominal reaction temperature is identical. Thermodynamic nanocrystal growth mechanisms predict that the only shape present after
microwave synthesis should be spheres due to the ultrafast evolution of particles, but a bimodal population of triangular nanoplates and spheroidal particles was obtained under microwave conditions. The development of triangular nanoplates provides further evidence that, in the absence of other shape directing agents, nanocrystal shape is largely dictated by the configuration of the initial seed clusters.

Maxwell T Dylla (244)
Faculty Mentor/Collaborator: Matthew C. Jewell
Fracture Statistics of Individual Nb₃Sn Filaments

Nb₃Sn cable-in-conduit superconducting wires are being used in magnet systems for experimental fusion reactors. The Nb₃Sn brittle filaments inside these wires can crack due to the high Lorentz forces generated during magnet operation; these cracks degrade the superconducting properties of the wires. Here, individual brittle Nb₃Sn filaments were tested under tensile stress to generate Weibull fracture statistics for Nb₃Sn filaments. It typically took around one gram of force to fracture a filament (350MPa stress). The Weibull statistics generated from this work will help create mathematical models used to simulate when filaments crack during magnet operation and the effect that those cracks have on the superconducting properties of magnet systems.

Michael Scott Farrell, Austin Richard Bol, and Dylan Gary Karis (245)
Faculty Mentor/Collaborator: Elizabeth M. Glogowski
Synthesis and Thermoresponsive Characterization of Poly(2-(dimethylamino)ethyl methacrylate) (PDMAEMA) Linear Polymers and Diblock Copolymers

Poly(2-(dimethylamino)ethyl methacrylate) or PDMAEMA can be classified as a “smart” polymer because it reversibly aggregates in solution in response to external stimuli such as temperature, pH, or concentration. Two types of PDMAEMA samples were synthesized: (1) linear PDMAEMA homopolymer, and (2) polyethylene glycol- or PEG-PDMAEMA diblock copolymers, both using Atom Transfer Radical Polymerization (ATRP). For PDMAEMA homopolymer, Gel Permeation Chromatography and Nuclear Magnetic Resonance spectroscopy were used to determine molecular weight of 50,000 Da and a Polydispersity Index or PDI of less than 1.15. The cloud point, or the temperature above which PDMAEMA is insoluble in water, of the linear PDMAEMA was measured using UV-Visible spectroscopy in pH 7, 8, 9, and 10 solutions with varying temperature. Diblock PEG-PDMAEMA was synthesized using a PEG macroinitiator and ATRP of DMAEMA monomer to achieve a diblock copolymer with a molar ratio of PEG to PDMAEMA of 1:2. Utilizing the fluorescent probe pyrene, fluorescence spectroscopy was used to determine the aggregation and micelle formation behavior of PEG-PDMAEMA as a function of concentration, pH, and temperature.

Caramon Alexander Ives, Samuel Bryan Emmons, and Jason A. Leicht (249)
Faculty Mentor/Collaborator: Douglas J. Dunham
Fabrication of Silicon Carbide Nanowires for Use in Electronic Devices

In this age of information and technology, the widespread usage of electronics will not be declining in the foreseeable future. Therefore, it is the goal of many companies to create smaller, more efficient products for consumers. Silicon Carbide Nano-Wires (SiCNWs) have been proven to be a viable option for the construction of nano-scale materials because of their unique electrical properties and physical durability. We have grown SiCNWs using two growth mechanisms: The first involves Si and an Fe catalyst in an oxygen depleted environment at high temperature. The second method consists of synthesizing wires by flowing Si vapor over carbon nanotubes (CNTs) at high temperature. This process forms bundles of SiCNTs, and SiCNWs grow on the nanotube bundles. Our analysis techniques involve elemental and chemical analysis using Scanning Electron Microscopy, Scanning Auger Nanprobe and X-ray Diffraction, and those techniques indicate that we’ve grown SiC wires on the nano-scale. Our process is currently being refined to promote controlled directional growth of SiC nano-wires on a larger scale.

Jason David Luhmann (243)
Faculty Mentor/Collaborator: Matthew C. Jewell
Strain Variation in NbTi Filaments

Nb-Ti superconducting wires are used in a wide variety of magnet systems to carry large electric currents and produce large magnetic fields of 1 – 5 T. These wires, consisting of Nb-Ti filaments located with the host Cu wire need to perform at engineered levels for optimal performance of the device. To do this, the wires are drawn to carefully-specified levels of strain, which causes precipitation of an α-Ti phase that dramatically improves the current-carrying capacity of the
superconductor. To assess how uniformly the strain is being applied to NbTi filaments within a composite wire, we have developed an image analysis technique to identify geometrical variations among filaments in a wire and between wires from different starting billets. In this study we use scanning electron microscopy (SEM) to perform the image analysis on two separate billets of the same initial design. One billet is found to have relatively uniform strain variations amongst the filaments, while the second billet is found to have a highly non-uniform distribution, as measured by geometric variables. This relatively simple approach can provide feedback to the wire manufacturer regarding the stability of the manufacturing process.

Tayo Aliake Sanders II and Mariah Noel Sauceda (247)
Faculty Mentor/Collaborator: Jennifer A. Dahl

Structural Characteristics of Crosslinked Gold Nanoparticle Networks Formed at an Air-water Interface

The structural dynamics of thin films of surfactant molecules can be characterized by their behavior in a Langmuir trough, where the molecules reside at the air-water interface. Parameters such as molecular order, film density, and surface pressure are easily addressed, and multilayer superstructures can be fabricated using this classic surface science strategy. Less common is the use of a Langmuir trough for the fabrication of organized two-dimensional arrays of alkanethiol-capped gold nanoparticles. Here, hydrophobic nanoparticles are introduced to the air-water interface as a solution in hexanes; as the solvent evaporates, the floating nanoparticles can be compressed into a monolayer within the Langmuir trough. Preliminary studies have explored the relationship between film morphology and the length of the hydrocarbon chain; it has been found that nanoparticles functionalized with alkanethiols having chain lengths < C16 form poorly organized films with low collapse pressures. We are reporting the use of a diethyl crosslinking ligand to improve film morphology. We have found that the addition of alkanedithiols prior to film compression yields covalently bound soft networks of nanoparticles with greatly improved collapse pressures, evident by Langmuir isotherm measurements and structural analysis of the films by transmission electron microscopy.

Nicholas J Sullivan and Jason David Luhmann (242)
Faculty Mentor/Collaborator: Matthew C. Jewell

Microstructural Sources of Reduced Residual-Resistance Ratio in Nb₃Sn Composite Wires

Residual resistance ratio (RRR) is a measure of metallic purity. In a superconductor inside a magnet system, impurities degrade the ability of electrical stabilizing materials to safely carry electric current in the event of a magnet quench. In this study, we have analyzed the ability of superconductor manufacturers to produce high-RRR niobium-tin (Nb₃Sn) wires in large batches and over time, as their productions have scaled up to meet current demand. Additionally, we have performed a microstructural investigation (using SEM/EDS) to determine the reasons for reduced RRR from one manufacturer. Nb₃Sn composite wires have never been produced in large quantities until very recently, and have never been characterized thoroughly. If statistical analysis shows that high RRR wire can be produced consistently, engineers will be capable of producing designs with an assurance that a batch of wire will behave as expected. Our microstructural analysis revealed that breakages within the diffusion barrier cause severe drops in RRR in the Nb₃Sn wires, a problem which can be remedied at the manufacturing level to result in more consistent wire.

PHYSICS AND ASTRONOMY

Roxanne Harriet Accola and Kathleen Ann Widmer (279)
Faculty Mentor/Collaborator: Matthew M. Evans

Heat Transfer Capacity of the Extremities in Diabetics

Human skin is a heat radiator system that allows for dissipation of the heat produced in the core as a byproduct of metabolism. During vasodilation, increased blood flow transfers heat to the skin in order to be lost to the surroundings. The palmar surface is one area of skin that radiates heat with high efficiency. The AVAcore CoreControl glove is a chamber designed to house a subject’s hand with a latex-sealed vacuum around the wrist. The palm, resting on a metal cone in the chamber, can then be heated or cooled. Our experiment investigated changes in the heat transfer capacity of the palm when this device is applied at 110°F in comparison to application of a hotplate at the same temperature. To test this, we collected thermocouple readings of a subject’s skin temperature, at the base of the palm and cubital fossa, and infrared photos, of the hands and forearms, before, during, and after the heating to document circulation patterns (skin temperature is a strong indicator of blood flow). Because of the harsh seal formed by the device, we will attempt to extrapolate the effects of the device on diabetic circulation from only the hotplate trials. We will share the results showing how effectively the AVAcore device warmed the test subjects, and some surprising results created by the apparatus. The significance of
our investigation will lie in determining whether the noninvasive heating technique offered by the device would improve circulation in diabetics.

Adam Edward Klefstad (277)
Faculty Mentor/Collaborator: Kim W. Pierson
Design and Computer Modeling of Ultracapacitor Regenerative Braking System

Our primary research objective was to create a computer model of an ultracapacitor regenerative braking system and compare its performance with a real circuit on a real electric scooter. The computer model was refined until its performance matched the real system performance. Once we had a reliable computer model of our simple circuit, a number of enhancements were added to the circuit design. Electronic sensors were installed to acquire real-time data of the state of charge (voltage) on the ultracapacitor, the amount of current going to and coming from the ultracapacitor, the voltage produced by the motor/generator on the scooter, and the speed of the scooter. A computer control program was used to monitor the sensors, analyze the data, and control the regenerative braking process. This data was used to assess the validity of our computer model and enhance the performance of the control program.

Mandy Christine Neumann (111)
Faculty Mentor/Collaborator: Nathan A. Miller
Imaging Dynamic Solar Activity in Hydrogen Alpha Light

In this project, we monitor the evolution of solar features, including prominences and filaments, as they travel across the solar surface. To do this, we take images by attaching a single lens reflex camera to a Coronado H-Alpha solar telescope, with the sensor plane at the focal plane. By recording a wavelength of high solar opacity, H-Alpha images of the sun accentuate the activity on the solar surface. We have worked to refine techniques to achieve the best focus, exposure, and imaging cadence. We bracket the exposure times over a wide range to emphasize activity both on the disk and above the limb of the sun. Different magnifications are also being used; we create both an image of the full sun which contextualizes features, and zoomed-in views of regions of interest showing more detail. When the best exposure times are determined, we take a series of photographs over a time frame chosen to best capture the evolution of the features and create a time series of the images taken. These images allow us to observe these solar features as they develop and change. The images are processed using Adobe Photoshop.

Thomas David Nevins (100)
Faculty Mentor/Collaborator: Paul Jonathan Thomas
Computer Modeling of Satellite Debris Following Breakup or Collision

With the increased use of satellites in low Earth orbit (LEO) there has also been an increase in the amount of man-made orbital debris in LEO. Events like the explosion of the Breeze M rocket stage last October and the collision between Iridium-33 and Cosmos-2251 satellites can create a great deal of debris which disperses after impact. These objects in high-speed orbit around the earth have great potential to damage functional satellites also in orbit. This can become a significant threat to the existing satellite array and even to future missions beyond Earth. This research project has constructed a theoretical model of all the forces on satellite debris in a non-inertial reference frame. Then a computer simulation was created using this theoretical model based on the concept of finite differencing. In this poster we will demonstrate the simulation by presenting the results for a simple model where the satellite fragments into twelve pieces of equal mass radiating in equally spaced directions. Predicted trajectories for the fragments and estimated orbital lifetimes will be given.

Jacob Allen Steltenpohl and Hyoki Lee (276)
Faculty Mentor/Collaborator: Kim W. Pierson
Labview-Controlled Quadcopter

Create an autonomous navigation routine for a quadcopter designed for an indoor GPS denied environment. A quadcopter is a small flying robot that has an array of sensors, motors, control electronics and radio communication link integrated into an airframe that requires various computer programs to control its operation. Currently, the control programs are written in C++, Python and various other programming languages. These programs all use a communication/command protocol called “MAVlink.” While these programs are open-source, they are written in too many different programming languages to be useful. The purpose of this research project is to determine if the MAVlink control programs can be ported to the industry standard programming language called LabVIEW. Porting the code over to LabVIEW would greatly simplify the process of developing and testing autonomous control programs. This would also provide support for future
robotic projects that incorporate the low cost open-source Arduino based microcontroller system called the “Arduino Pilot Module.” The current quadcopter system has an Arduino as the main flight controller system. A beta LabVIEW communications program has been developed and tested. After further refinement of this program, a LabVIEW autonomous navigation control program can be developed.

Michael James Yohn (278)
Faculty Mentor/Collaborator: Matthew M. Evans
Laminar Fluid Flow in Non-Circular Pipes

The properties of laminar fluid flow have been well understood in the context of circular pipes for years. These properties, however, have not been well researched or compared to identical properties for pipes of a non-circular shape. These comparisons have applications for space saving and efficiency increases in architecture, engineering, and even medicine. Half pipes of a circle, square, and triangle with uniform cross sectional surface area were constructed with PVC piping and sheeting, and filled with corn syrup. Aluminum foil squares were suspended in the corn syrup and their movements were observed. The flowing syrup was captured in digital video and then run through video analysis in LoggerPro to determine flow rates for various points. This analysis allows for fluid and energy transfer determinations and comparisons between the differently shaped pipes to be made, allowing for analysis of pipe shape efficiency as a whole.

WATERSHED INSTITUTE AND GEOGRAPHY AND ANTHROPOLOGY

Phillip Paul Rynish, Kaleigh Spickerman, and Tyler John DeBruin (91)
Faculty Mentor/Collaborators: James E. Boulter and Sean Hartnett
Arboreal Profiling of the UW-Eau Claire Campus: Baseline Map

Beginning in 2010, the University of Wisconsin-Eau Claire entered a major construction phase. The campus has already completed one building since then, started another, and has at least one more in the planning stages. The Facilities Master Plan for the campus anticipated major tree loss due to the construction, and pledged a 3:1 replacement ratio for the trees lost in order to preserve the unique campus ecology UW-Eau Claire enjoys. These replacement trees were to have at least a 3 inch caliper diameter measurement when planted. This study was done to quantify trees loss and ensure trees are properly replaced in accordance with the Master Plan. Utilizing GPS and GIS technologies, all trees in landscaped areas of the campus were recorded for species, size, and location. Initial figures show that the construction of the W.R. Davies Student Center, New Education Building, and Haas Fine Arts Parking Lot renovations have resulted in an approximate 15 percent loss in total trees. Study will be continued as construction progresses to account for additional tree loss and new tree plantings.

SOCIAL SCIENCES

ACCOUNTING AND FINANCE

Abigail Habeck and Adam Revak (129)
Faculty Mentor/Collaborator: Dawna M. Drum
Perceptions that Drive Cloud-Based Application Adoption Decisions by Students and Faculty

Cloud computing is an emerging technology with infinite applications in the future classroom setting. As this technology gets further intertwined into our society, it has the potential to positively change the way students learn, work with peers and instructors, and even accomplish work in their future careers. The purpose of this research was to explore the effects of Cloud computing from an educational perspective to determine what aspects of Cloud create a desirable and adoption-worthy product to students. In order to do so, this research examined different factors such as how students use Cloud products in and out of the classroom, how group projects will be altered due to new forms of collaboration, and how teachers incorporate Cloud products into lessons and assignments. The findings are based on previous research on Cloud computing and the methodology used for similar studies conducted on various technologies, such as diffusion of technology in the classroom and the integration of Cloud computing in other aspects of life. We conducted student and faculty surveys, providing specific examples on the level of knowledge students and faculty have on the technology and how they may already be using Cloud computing. The conclusions offer a better understanding of the decision processes behind the adoption of Cloud computing by students and faculty, and propose an idea of what factors of Cloud computing are
involved in the decision to adopt. Based on these factors, this research provides information for instructors on the importance of integrating Cloud into students’ education because of the rapid pace of integration in the business world and other future careers. A future phase will supplement these results with qualitative data through interviews.

**COMMUNICATION SCIENCES AND DISORDERS**

Heather Rose Buhr (227)
Faculty Mentor/Collaborator: Jerry K. Hoepner
*Examining the Influence of Physical Engagement on Social Engagement at Aphasia Camp*

With the rise of freely accessible social networks like Facebook® and Twitter®, our opportunity to communicate with others is virtually limitless. However, most social networks are not designed with communication disorders in mind; their chronological organization, abundant feature sets, and busy presentation inhibit communication for many. In this collaborative project between Computer Science and Communication Sciences and Disorders, we designed a new social network to serve individuals with aphasia, an acquired language disorder compromising an individual’s ability to effectively express his/her thoughts. Research has shown aphasia has chronic effects on individuals that may lead to progressive and prolonged social exclusion. The goal of our application is to provide a clean and intuitive interface that will not only improve the accessibility of social media for individuals with aphasia, but also will implement therapeutic techniques to aid the individuals in preventing social exclusion. The course of the project consisted of four phases: design, implement, test, and evaluate the results of the application. Findings from the project will inform us of opportunities for individuals with aphasia to better interact with social media.

Laura Elizabeth Mackey, Laura Ann Michaelson, Cassandra Leigh Schilling, and Abigail Rose Konitzer (226)
Faculty Mentor/Collaborator: Jerry K. Hoepner
*The Effects of Partner Relationships on Communication with Individuals with Traumatic Brain Injury (TBI)*

The purpose of our research project was to find out how partner behaviors in communication affect individuals with a Traumatic Brain Injury. As future Speech Language Pathologists (SLPs) successful communication is an important factor to a person’s quality of life. By understanding how a conversation partner can support successful communication in a person with a TBI, appropriate intervention can be provided. Four individuals with a TBI had conversations with three different partner types. These conversations were evaluated to find out how the partners’ interactions affected the person with a TBI. The conversation partner’s support behaviors varied across partner types. The differing conversation behaviors evoked distinctive responses in the person with a TBI. Due to this correlation we see that the partner’s contributions do affect successful in a person with a TBI.

Kristin Sarah Baird (54)
Faculty Mentor/Collaborator: Xiaodong Kuang
*What do the Current UW-Eau Claire Students Know about the Office of Research and Sponsored Programs, and How?*

This research intends to find out what the University of Wisconsin-Eau Claire students know about the Office of Research and Sponsored Programs and through which channels they have received this information, with an attempt to provide baseline data for the Office to plan a new communication campaign. An online survey was distributed through 10 randomly selected department email lists, which included questions about the awareness of, involvement with, and perceptions on faculty/student collaborative research, as well as the channels through which the students receive the related messages. Among 160 responses, less than one third have even heard about ORSP, and only 17% have been involved with an ORSP-funded research project. However, all of the surveyed students agreed that being involved with ORSP would be beneficial, and 81% would like to get involved with research if they were given opportunity. The most suggested channel of communication is personal communication, either through professors, advisors, or student representatives.

Katie Lynn Johnson (24)
Faculty Mentor/Collaborators: Nicole Schultz and Jeffrey A. Goodman
*Peer Haven Mentoring Program*

University of Wisconsin-Eau Claire’s Peer Haven-LGBTQ (lesbian, gay, bisexual, transgender, queer/questioning) Mentorship Program mission is “To help students develop a positive LGBTQ identity while successfully adapting to life at UW-Eau Claire.” While broad-based research on mentorship exists (see Durlack, 2011; Russell & Horne, 2009; Knox, Schlosser, Pruitt, & Hill, 2006), research has sparsely examined details about coordinating such programs on university
Amanda Rose Somerville (69)
Faculty Mentor/Collaborator: Eun Soo Rhee

To Share or Not to Share: Analyzing the Motivation to Pass Along and Consume Online Contents

The current study was conducted to understand the underlying processes of how online contents become viral, especially focusing on the motivation to both consume and pass along the viral contents to others. Previous research on viral marketing outlines four potential motivations for passing along online contents: the need to be part of a group, the need to be individualistic, the need to be altruistic, and the need for personal growth. Although previous studies have analyzed why individuals pass along online contents, they have not analyzed what influences them to be motivated to pass it along again to others. Therefore, qualitative interviews with three undergraduate students were conducted to reveal the obscured insights underneath the processes of consuming and forwarding viral contents. Findings of the study showed that the motivation to consume and pass along the viral contents is closely related to the level of uncertainty about others’ preferences and reactions, which leads to the difference in consumption and pass-along patterns. Our findings support and build from previous research but also provide evidence for Uncertainty Theory and Uncertainty Reduction Theory.

COMMUNICATION AND JOURNALISM

Virgil Ward II, Laura Kathleen Turner, Alexandra Marilyn Zaic, and Katlynn Therese Balson (37)
Faculty Mentor/Collaborator: Martha J. Fay
Conflict, Supportive Communication, and Group Satisfaction

This study examines the relationship between conflict within groups and three variables: perception of supportive communication during conflict, and project and group satisfaction. Types of social support (Bowsher, Langford, Maloney, Lillis, 2008), perceived intent of social support (Bodie, Burleson, & Jones, 2012), and group and task commitment (Bayazit and Mannix, 2003) have been associated with group and project satisfaction; however, research is limited on how these variables together impact group and project satisfaction. This study incorporates Burleson’s (2009) Dual-Process theory of supportive communication outcomes to assist in explaining the effects of multiple variables within a socially supportive context in which conflict between members has occurred. Participants were recruited from several Midwestern colleges and asked to complete a questionnaire in which a group conflict scenario was given. The questionnaire gathered data needed to analyze participants’ responses to received supportive communication during a conflict and the impact that the supportive communication had on group and project satisfaction. Findings are expected to illuminate a more exact relationship among the three variables and their effects on group and task satisfaction.

Abigail Jame Acker, Abbey Margaret Lowenstein, Mark David Quamme, and Allison Paige Cegla (67)
Faculty Mentor/Collaborator: Martha J. Fay
Political Satire and Student Perceptions of Politics

The purpose of this study is to determine whether college students’ exposure to political satire via The Daily Show and the Colbert Report is associated with perceived credibility of politicians, perceptions of congressional effectiveness, and strength of identification with reported political party affiliation. Research by Podlas (2010) found that viewers of the Colbert Report and The Daily Show felt that their political ideologies were represented positively within these shows, whereas Oh, Park, and Wanta (2012) found that viewers of televised media (including both the aforementioned programs along with traditional news outlets) believe that their political party is represented negatively. These findings indicate that there is still much to learn about how political satire is associated with attitudes pertaining to various political beliefs and leanings such as congressional effectiveness, and one’s political party affiliation. Students were recruited via Facebook and researcher contacts and asked to complete an online survey measuring frequency of exposure to two political satire programs, and their perceptions of politicians, government effectiveness, and political party identification. Results are
expected to clarify previous inconclusive findings on the relationship between exposure to political satire and political attitudes.

**Lia Noelle Ashley (68)**
Faculty Mentor/Collaborator: Martha J. Fay

*Issue Salience and its Impact on Opinion Expression in Computer Mediated Group Work*

Research shows that individuals with high levels of communication apprehension (CA) benefit from the less threatening social environment of computer-mediated communication (Campbell & Neer, 2001), but are less willing to express their opinion than those with low levels of CA (McCroskey, 2009). However, less is known about how the salience of an issue may mediate the relationship between communication apprehension and opinion expression. Impression management theory suggests that individuals manage their behavior so others perceive them positively (Leary & Kowalski, 1990). This desire to be perceived as positive may be a factor in whether a group member decides to express an opinion. However, the importance of the group project to the individual may overshadow the desire to be perceived as positive. This study seeks to determine whether group project salience mediates the relationship between CA and opinion expression in computer-mediated group work. An online survey was sent to students at Midwestern colleges and universities to determine potential associations between CA, willingness to express opinion, and salience of the group project. Variables will be measured using McCroskey’s (1982) Personal Report of Communication Apprehension, the Unwillingness to Communicate scale (Burgoon, 1976), and the Impression Management in Organizations scale (Bolino & Turnley, 1999).

**Alexandra Rose Frank, Matthew Coenen, and Kristina Kari Matthes (52)**
Faculty Mentor/Collaborator: Martha J. Fay

*Transformational Leadership, Job Satisfaction and Organizational Citizenship Behavior: Does Communication Apprehension Mediate the Relationship?*

Transformational leaders help transform followers into leaders by empowering followers. They do this according to followers’ individual needs and by aligning the objectives and goals of the individual followers, the leaders, the group and the larger organization (Bass, 2005). Generally considered an effective way to lead, transformational leadership (TL) has been found to be associated with positive individual and organization outcomes (Nielsen, 2008), including job satisfaction (Madlock, 2008) and organizational citizenship behavior (OCB) (Rose Su-Jung Lin, et al., 2012). However, less is known about potential factors that may mediate these relationships. Communication apprehension (CA) is defined as an individual’s level of fear or anxiety with either real or anticipated communication with another person or persons (McCroskey, 1977). Because CA has been directly related to job satisfaction (Macksey and Lewis, 1982), it is possible that the previously documented direct relationship between TL and positive outcomes, job satisfaction and OCB may be different for individuals with high CA, i.e., individuals with high levels of CA may be less satisfied with their jobs and less likely to display OCBs even when lead by a TL. Using a survey distributed to full-time professional employees in the Midwest region, this study seeks to determine whether CA is a mediating variable between TL, job satisfaction and OCB.

**Kendra Jirschele, Molly Theresa O’Hearn, Alexiss Jeffers, April Kay Palmer, and Alyssa Jane Wichman (38)**
Faculty Mentor/Collaborator: Martha J. Fay

*Wellness Programs and the Effects on Job Satisfaction*

Research has shown there is an association between existence of wellness programs and job satisfaction, because worksite wellness programs create positive attitudes and make employees happier (Parks & Steelman, 2008). Although a clear link has been established between provision of wellness programs and job satisfaction, less is known about other variables that may mediate this relationship. In addition, the mere existence of a wellness program doesn’t translate into use; given that only an estimated one-third to one-half of employees utilize organizational onsite wellness programs on a regular basis (Schwetschenau, O’Brien, Cunningham, & Jex, 2008). This study examines the potential mediating factors of source of support, channel of communication and perceived organizational intent on offering wellness programs on the relationship of the existence of the wellness program and job satisfaction. Source of support, channel of communication and perceived organizational intent are tested for possible association with likelihood of participation in wellness programs. Full-time employees at midsize organizations were asked to complete an online questionnaire measuring likelihood of participating in wellness programs and job satisfaction. The results are expected to clarify the relationship between the mediating variables in relation to job satisfaction and likelihood of participation in wellness programs.
Kelsey Lee Joswiak, George Robert Petrie, and Megan Renee Green (39)
Faculty Mentor/Collaborator: Martha J. Fay
The Effects of Tyrannical Leadership on Efficiency of Small Group Task Performance

This study examines both the relationship between tyrannical leadership and small group task performance, and the potential mediating effects of communication apprehension and self-esteem. Aasland, Skogstand, Notelaers, Nielsen, and Einarsen (2010) found that tyrannical leadership in management is more prevalent than previously known and that tyrannical leaders often negatively affect group performance (Aryee, Sun, Chen and Debrah, 2008). However, less is known about other factors that may impact the leader-follower relationship. This study further explores the relationship between leadership style and efficiency by looking at potential mediating variables of communication apprehension (CA) and self-esteem. Rubin, Rubin, and Jordan (2009) showed that positive classroom instruction reduces student CA. In addition, people with higher self-esteem were less likely to yield to leaders and more likely to emerge as leaders themselves, leading a group to follow and therefore overcome the leader already in place (Andrews, 1984). This study employs an experimental design placing college student participants in groups under the direction of either a constructive leader or a tyrannical leader and measures group efficiency between the two groups. CA and self-esteem are measured using McCroskey’s Personal Report of Communication Apprehension (1985) and Rosenberg’s Self-Esteem scale (1989).

Jordan Lindsey Kitch, Carlie S. Hagerman, Claire Elizabeth Szpara, Grace E. Collura, and Seng Yeng Xiong (53)
Faculty Mentor/Collaborator: Martha J. Fay
Student Perceptions of Source Credibility and Health-Related Behavior: A Case Study

Previous research has shown that college students’ intentions to perform health-related behaviors vary based on students’ perception of credibility of the source providing the message (Jones, Sinclair & Courneya, 2003). The most available source of health information for college students is on-campus health services, however, studies have also shown that even though students are knowledgeable about the health services offered on college campuses, awareness does not necessarily translate into use (Fletcher, Bryden, Schneider, Dawson & Vandermeer, 2007). This study examines the perceptions of source credibility and level of trust among college students when seeking information on particular health needs offered on one Midwestern college campus. Participants completed an online survey to examine their perceptions of various health message sources, and their perception of source credibility using Wheeless & Grotz’ (1977) Individualized Trust Scale. The results should illuminate student health information-seeking behavior relevant to perceived credibility of campus-offered services and may suggest ways to improve source credibility.

DEAN OF STUDENTS

Demetrius Evans, Kaetlyn Leah Graham, Marissa Anne Coulter, and Alayna Marie Spengler (215)
Faculty Mentor/Collaborator: Jodi Thesing-Ritter
Assessment of the Impact of the Civil Rights Pilgrimage on Student Participants

The development of intercultural competence is a learning outcome priority for university students. In an effort to foster intercultural competence development, one Midwestern university had developed a program of intercultural immersion for students. One such program, known as the Civil Rights Pilgrimage, offers students a ten day travel experience to explore issues of racism and privilege using the historical backdrop of the civil rights movement. This current research study is an ongoing exploration of the learning outcomes achieved from this experience assessed the impact the travel opportunity has on the development of intercultural competence, understanding of personal privilege, and reduction of racism and sexism. These factors are measured using a quantitative analysis of pre- and post-trip writing samples. Researchers also administered pre- and post-trip assessments using a researcher developed survey to assess movement on the Association of College and Universities Intercultural Knowledge and Competence VALU rubric. Participants also responded to questions from the Melville-Guzman Universality-Diversity Scale (short form), Modern Sexism Scale, Modern Racism Scale and the White Privilege and Attitudes Scale.

Elizabeth Ashley Harris, Abigail Lee Nygaard, and Sheina Aurora Wind (213)
Faculty Mentor/Collaborator: Heather D. Harris
Blugold Beginnings Summer Camp: An Evaluation of Outcomes for STEM, Transition, and Academic Pre-college Summer Camps

The Blugold Beginnings Summer Camp programming was developed to promote academic activities for traditionally underrepresented students in the Eau Claire Area. Three different camps were developed to facilitate the transition of stu-
students into middle school, provide knowledge about post-secondary education, and to encourage interest in STEM related careers. The transition camp consisted of 20 students who learned skills to ease their anxiety of transitioning into middle school. The pre-academic camp consisted of 29 students in middle and high school. Students gained information about college, attended mock college classes, and lived in the residence halls. The STEM camp consisted of 36 students who participated in field trips, and attended university professors’ and local teachers’ presentations on exciting STEM related topics. For each camp, pre- and post-surveys were administered to assess students’ attitudes towards post-secondary education, interest in STEM fields, and also their self-reported levels of anxiety transitioning from elementary to middle school. Researchers assessed students’ knowledge of and positive attitudes towards post-secondary education, their anxiety regarding the transition to middle school, and their interest in STEM fields to determine whether students who participated in these camps tend to significantly change on these measures.

Elizabeth Ashley Harris, Samara Sarahi Gaitan, Bailey Frances Boelter and Kelly Sue O’Donnell (214)
Faculty Mentor/Collaborators: Heather D. Harris and Lissa Jo Martinez Greer
Closing the Achievement Gap: An Investigation into the Efficacy of the Blugold Beginnings College Access Program

The Blugold Beginnings Fifth Grade Mentoring Program was developed to teach low-income, minority, and first-generation students the steps necessary to enter a post-secondary program, along with the skills associated with academic success. This program supports fifth grade students from seven elementary schools in the Greater Eau Claire Area by offering mentoring and tutoring services. During weekly mentoring sessions, students completed a grade-specific curriculum that teaches seventeen topics including study skills, organizational skills, and goal setting. Mentoring sessions encourage students to pursue higher education through various avenues. Student growth was measured via pre- and post-assessment surveys. Students self-selected into three groups: recess, afterschool mentoring, and both recess and afterschool mentoring. The recess group consisted of college-themed activities and basic post-secondary education content. The afterschool group had a grade-specific curriculum and worked with a college mentor, while a third group participated in both themed recess activities and afterschool workbook activities with mentors. Although we anticipate all participants on average to show increases in knowledge of the content covered and on measures of confidence pertaining to education, we predict that students involved in the afterschool mentoring program will tend to show greater increases.

Abigail Lee Nygaard, Elizabeth Ashley Harris, Sheina Aurora Wind and Andrew William Czech (237)
Faculty Mentor/Collaborators: Heather D. Harris and Jodi Thesing-Ritter
Blugold Beginnings Multicultural Learning Community: A Comparison of Campus Involvement and Persistence

The Blugold Beginnings Multicultural Learning Community (BBMLC) was developed to facilitate the transition into college for minority students attending the University of Wisconsin-Eau Claire. Students in the BBMLC participate in a college orientation camp before the start of their freshman year and are also provided employment through Blugold Beginnings. Additionally, participants enroll in a common academic course, are encouraged to participate in immersion experiences such as the Civil Rights Pilgrimage, and are paired with a faculty member who serves as a resource throughout their undergraduate career. For the purposes of this study, members of the BBMLC were matched to other multicultural students on campus based on an array of factors including gender, ethnicity, expected family contribution, intended major, and college entrance exam score. This research investigates whether students in the BBMLC cohort report significantly higher levels of campus involvement and comfort utilizing campus resources than students in the other cohort. A comparison of motivation and personality factors is used to determine whether there are overall differences in personality traits and motivation for obtaining higher education between groups using the Ten-Item Personality Inventory (Gosling, Rentfrow, & Swann, 2003) and the Motivations for Attending University Questionnaire (Phinney, Dennis, & Osorio, 2006).

Abigail Lee Nygaard, Giney Claribel Rojas, Choua Xiong, and Khue Yang (238)
Faculty Mentor/Collaborators: Heather D. Harris and Kristi L. Herbenson
High School Blugold Beginnings Program: An Investigation of Program Impact

The Blugold Beginnings High School Program teaches traditionally underrepresented students about post-secondary education while building skills associated with academic success. Mentors meet with participants at North High School and Memorial High School weekly during study halls or classes. During this time, mentors tutor area students and complete a grade-specific curriculum emphasizing academic skills (e.g., goal setting, organization skills, time management, etc.), college preparation (e.g., resume making, financial aid, applying for scholarships, etc.), and life skills (e.g., budgeting money, exploring careers, planning ahead, etc.). Two surveys were administered to participants throughout the school year consisting of two segments: 1.) students’ opinions regarding post-secondary education and their probability of pursuing a post-secondary program, and 2.) students’ level of understanding regarding post-secondary and career requirements.
Students also completed an additional survey measuring two types of self-efficacy: 1.) self-regulated learning, and 2.) academic achievement. For the purposes of this study, researchers compared students’ scores to determine whether there were significant increases in participants’ comfort with post-secondary education and on their performance on objective measures. Students’ responses on these measures are also compared as a function of program attendance to determine whether students who attend more mentoring sessions tend to show the greatest improvement.

Sheina Aurora Wind, Grant Christian Butterfield, Txuc Xiong, and Kou Yang (207)
Faculty Mentor/Collaborators: Heather D. Harris and Katie Veronica Gorell
Middle School Blugold Beginnings Program: An Assessment of Growth and Outcomes of Students Enrolled in the Program

The Blugold Beginnings Middle School Program was developed at the University of Wisconsin-Eau Claire to teach traditionally underrepresented students the necessary steps for entering a post-secondary program and skills associated with academic success. This program supports students from sixth through eighth grade and offers additional mentoring and tutoring services. During the weekly mentoring sessions, participants completed a grade-specific, twenty-seven week curriculum, maximizing academic skills (e.g., organizational skills, scheduling, academic study skills, etc.), and skills that will help prepare students for a post-secondary education (e.g., writing a personal statement, resume making and building, applying for financial aid, exploring careers, etc.). Student participants are from four middle schools in the Eau Claire Area: Altoona, Delong, Northstar, and South. Student growth was measured via pre- and post-assessments. Supplemental surveys measured students’ homework habits as well as their academic motivation. Researchers predict that students in the program will tend to show significant gains in their levels of understanding post-secondary education requirements as well as their self-reported feelings of comfort and confidence. Participants will also be compared based on program attendance to determine whether students who attend more mentoring session tend to show greater gains in these areas.

ECONOMICS

Eric Ronald Englebert (228)
Faculty Mentor/Collaborator: Yan Li
Private Money and the Central Banking

This project studies the issue of private money and how it weakens the central bank’s ability to conduct monetary policy. We have revised the conventional monetary model so that fiat money and private money could coexist. Based on appropriate modeling, we find private money does dampen the power of central banking. In the meantime, we try to forecast the evolution of private money by using existing private money data. The results predict that the use of private money will continue to grow in the future.

Sara Renee Fisher, James Francis Markert, Anthony James Navara, and Samuel Robert Falls (199)
Faculty Mentor/Collaborators: Eric M. Jamelske and Laura A. Middlesworth
The Great Recession in California and Nevada: Comparing Employment Effects in Two Neighboring Western States

The economic downturn that began at the end of 2008 has become known as the Great Recession and, by most accounts, the economy has been slow to recover from this hit. The standard way of judging the severity of a recession and success of a recovery is to look at labor market information. In California the unemployment rate rose from 5.4% in 2007 to 12.3% in 2010 reaching a high of 12.4% in six of twelve months during 2010. Nevada’s experience was a little more dramatic as the unemployment rose from 4.7% in 2007 to 13.8% in 2010 reaching a high of 14.0% in fall 2010. In terms of employment, the number of jobs in Nevada dropped by over 13.5% as they lost over 175,000 jobs. Although the job loss in California was not as severe, employment did fall by over 8% as almost 1,250,000 jobs were lost. Comparing state level labor market data for these two neighboring states masks the variation in the recession/recovery experience across counties. This study provides a detailed examination of county level employment and unemployment data and relates it to differences in employment by sector in both California and Nevada.
Ryan Andrew Halliday, Oyunsuren Enkhbat, Jacob Raleigh, Jeremy Michael Schmitt, and Caleb Anthony Butera (198)
Faculty Mentor/Collaborators: Eric M. Jamelske and Laura A. Middlesworth

Comparing the Return on Investment: Tracking the Dogs of the Dow versus the Eau Claire Basket

The Chippewa Valley Center for Economic Research and Development (CVCERD) tracks the annual return on investment for the Eau Claire Basket (ECB) and the Dogs of the Dow (DOGS). The DOGS is an investment strategy based on selecting the ten Dow Jones Industrial Average stocks with the highest dividend yield, while the ECB consists investing in companies with an employment presence in the Eau Claire region. This project presents an annual comparison of the performance of the ECB and the DOGS for the six year period from 2007 to 2012. The DOGS had a positive return in five of the six years (2007, 2009, 2010, 2011 and 2012) compared to only three positive years for the ECB (2009, 2010 and 2012). Both investments were down significantly in 2008, but the ECB rebounded much stronger, rising 75.06% in 2009 compared to an increase of 17.02% for the DOGS. Overall, if $100,000 were put into each investment at the beginning of 2007 just let ride through 2012, the ECB would have returned $134,490 compared to only $110,259 for the DOGS. The rest of the poster provides a more detailed examination of the companies in both the DOGS and ECB.

Brandon Jared Magliocco (223)
Faculty Mentor/Collaborator: David L. Schaffer

Changing Wage Rates Among Employed Men and Women in the United States

The goal of this study is to analyze the changing hourly wage rates among employed men and women in the United States since 1932. Using the United States Census Bureau data, we have generated cohorts of different birth years in order to portray the changes in hourly wage rates over the lifespan of different age groups. Furthermore, we incorporated differing education levels into these cohorts to determine their impact on hourly wages. Although the study is still in progress, distinct trends have been produced as a result of the completed analysis.

Anthony James Navara, Sara Renee Fisher, James Francis Markert, and Samuel Robert Falls (222)
Faculty Mentor/Collaborators: Eric M. Jamelske and Laura A. Middlesworth

The Great Recession in Minnesota and Wisconsin: Comparing Employment Effects in Two Neighboring Midwestern States

The economic downturn that began at the end of 2008 has become known as the Great Recession and, by most accounts, the economy has been slow to recover from this hit. The standard way of judging the severity of a recession and success of recovery is to look at labor market information. In Minnesota the unemployment rate rose from 4.7% in 2007 to 8.0% in 2009 reaching a high of 8.3% in spring 2009. Wisconsin’s experience was a little more dramatic as the unemployment rate rose from 4.8% in 2007 to 8.8% in 2009 reaching a high of 9.2% in summer 2009. In terms of employment the number of jobs in Wisconsin dropped by over 5% as they lost over 150,000 jobs. Although the job loss in Minnesota was not as severe, employment did fall by over 4.5% as more than 130,000 jobs were lost. Comparing state level labor market data for these two neighboring states masks the variation in the recession/recovery experience across counties. This study provides a detailed examination of county level employment and unemployment data and relates it to differences in employment by sector in both Minnesota and Wisconsin.

ECONOMICS AND GEOGRAPHY AND ANTHROPOLOGY

Emily Kay Anderson and Ben James Possi (229)
Faculty Mentor/Collaborators: Laura A. Middlesworth and Ryan D. Weichelt

Collusion or Illusion: A Tri-State Analysis of Gas Prices

Our goal with this research project was to verify and explain the observation of higher and more uniform gas prices throughout Eau Claire vs. other upper Midwest locations, an objective that involves the use of concepts and tools from both economics and geography. In order to study this issue, we chose to examine ten similar cities within the states of Iowa, Minnesota, and Wisconsin. Data obtained from the Oil Price Information Service was used to study wholesale and retail prices in these cities to determine if the observation of higher prices was supported and to attempt to explain any patterns noted. We also studied gasoline related legislation in Wisconsin, including the Minimum Markup Law, in order to further explain a variance in prices between states. In addition, we looked at the density of gasoline sellers, the variance in prices across stations, and the market share of the various brands within each city in order to study the level of competition. After we completed our research, our group found that seller density, Wisconsin’s Minimum Markup Law, and a lack of competition all play an important role in explaining why we see higher and more uniform gasoline prices in Eau Claire.
EDUCATION STUDIES

Choua Xiong, One Yang, and Bao Kou Moua (250)
Faculty Mentor/Collaborator: Christin A. DePouw
Exploration of the Value of Hmong-Related Curricula to Hmong American Postsecondary Students

This project used semi-structured individual and group interviews to explore the significance of and value of Hmong-related curricula to Hmong American postsecondary students through a Critical Race Theory (CRT) lens. Our research contributes to larger debates in higher education about the value of race conscious policies in admissions and about the value of ethnic studies programs and curricula (Ancheta 2012). These debates often position Asian American students as ‘honorary Whites’ or as racial minorities who are not institutionally disadvantaged and who, therefore, may not need to be targeted by equity or inclusion policies (Harris 1993, Ngo and Lee 2007). Our investigation of Hmong American postsecondary students’ value for Hmong-related curricula illustrates some of the complexities within policy discussions around ethnic studies and also highlights the multiple ways in which students’ lived experiences on campus are impacted by the inclusion of or absence of Hmong-related information within their courses.

ENGLISH

Kristina Lynne Malec (157)
Faculty Mentor/Collaborator: Heather Ann Moody
Pine Ridge Reservation: Student Drop-Out Rate and its Contributing Factors

Last taken, statistics reported that the student drop-out rate on the Pine Ridge Reservation is at 70%. My research searched out the current statistics, contributing factors of these statistics, and the preventative measures that the schools and the community are taking to decrease this number. Utilizing a mixed-methods approach, I compared statistics between the nationwide Native American student drop-out rate and the student drop-out rate on the Pine Ridge reservation. I also researched the causation factors for Native American student drop-outs on a nationwide level and then compared those findings to the current situations on the Pine Ridge reservation to try to pinpoint the exact cause for such a high drop-out rate.

FOREIGN LANGUAGES

Karissa Kay Beebe (83)
Faculty Mentor/Collaborator: Carlos G. Garcia
Exploration of the Need for Translation and Interpretation Services in the Eau Claire Area

The purpose of this qualitative research was to investigate the current needs of medical facilities in the Eau Claire area pertaining to Spanish-speaking clients. The data were used to establish recommendations and improve preparation of student interpreters at the University of Wisconsin-Eau Claire (UWEC). The data may help decrease the number of errors that occur due to communication and may improve preparedness of students at UWEC to enter the work force as interpreters and medical professionals. Medical managers from four separate health care facilities were interviewed to determine interpretation needs. Outcomes indicated that there is a great need for Spanish services in the area. The syllabus for the Spanish for Health Care Professions class was revised to include interpretation skills; proficiency was then measured using a post-test. Results showed that students felt more comfortable with translation skills at the end of the semester. Recommendations for the local medical facilities included: developing a department specifically for the coordination of translation and interpretation services, signing privacy documentation to allow students to shadow and/or volunteer as interpreters, and developing use of video interpretation in place of phone interpretation.

GEOGRAPHY AND ANTHROPOLOGY AND FOREIGN LANGUAGES

Crystal Luag Ntxhi Vang (255)
Faculty Mentor/Collaborators: Kelly A. Wonder and Ezra J. Zeitler
The Modernization of Paj Ntaub in China

The goal of my research was to find out how Paj Ntaub in China has changed due to modernization. Paj Ntaub, also known as Flower Cloth, is embroidery of textiles done by Hmong women. Traditionally stitched by hand, these artworks
show status, the clan you belong to, and, more recently, the stories of the Hmong people. The importance of my research is to educate those who are interested in the dying art and the traditions it holds which can be a lesson for both Hmong and Non Hmong. By interviewing numerous Hmong villagers in Yunnan Province in Southwest China and observing their practices, I learned that the art itself is slowly fading, and, if Paj Ntaub is produced, it rarely is by hand. In addition, machines are used to print Paj Ntaub textiles onto the fabric for mass production. A Paj Ntaub skirt could take up to three to six months to make by hand while a machine would print one in a matter of seconds or stich one in an hour.

Cindy Mai Yang (257)
Faculty Mentor/Collaborators: Kelly A. Wonder and Ezra J. Zeitler
Hmong China History: Funeral Practice of the Chinese Hmong

During a three-week visit in China involving 10 Hmong-Chinese villages, participants were interviewed about their traditional, spiritual, and ritual knowledge of funerals and the process of how funerals are performed. Funerals are important to the Hmong-Chinese and Hmong-American community. My goal was to research the origin and the meaning of each process that is performed. The findings show that there are many similarities between the funeral practice of Hmong-Chinese and Hmong-Americans. The biggest similarity includes the Qeej, a sacred Hmong instrument that is used for entertainment, as well as for funerals. During funerals, the free-reed mouth organ encrypts lengthy poems and songs that guide the dead back to his/her ancestors. Using interviews that were gathered during this visit, the study compares the Hmong-Chinese perception of this practice with the Hmong-American perception.

See Yang (254)
Faculty Mentor/Collaborators: Kelly A. Wonder and Ezra J. Zeitler
The Effect of Education on Gender Roles in Hmong Daily Life in China

For years, the Hmong people have always been a patriarchal society where men and women took on household chores and roles that were considered to be gender appropriate. Because of education and its influence in society today, gender roles in the Hmong community have changed. The purpose of this research was to examine the effect education had on household gender roles within the Hmong communities in Yunnan Province, China, with an emphasis on generational differences and educational experiences. Using ethnographic fieldwork, including both participant observations and interviews, the research was conducted within three weeks by visiting 16 different Hmong-Chinese communities and interviewing 12 participants. Findings from China showed that educational attainment relies on family economic status for both males and females. However, because of gender roles, males are more likely than females to be encouraged to seek education regardless of their families’ economic status. It also suggests that more research should be conducted in this area of study due to the lack of resources on the topic of education and its effect on gender roles for the Hmong in China.

Becky Vang (258)
Faculty Mentor/Collaborator: Ezra J. Zeitler and Kelly A. Wonder
The Migration and Mobility of the Hmong-Miao in China

During the summer of 2012, for three weeks in the Yunnan Province of China, I researched the migration and mobility of the Hmong-Miao. The Hmong-Miao is equivalent to the Hmong people of the United States. Because of such limited information resources about the Hmong people, there is no certainty of their origin. China is said to be where Hmong people began; however, research has shown that the Middle East may have also been where the Hmong population initiated. While visiting 16 Hmong villages, I examined, interviewed, and collected answers about the habitations of the Hmong-Miao. Individuals were spoken to on a one-to-one basis about why they changed their homes. The outcomes indicated they moved due to the limited food supply or to the Government transferring families to different locations. Based on the research, many Hmong-Miao families had very similar stories of migration and mobility, but further research is needed because the population of the Hmong people is expanded widely throughout Asia.

Choua Xiong (251)
Faculty Mentor/Collaborators: Ezra J. Zeitler and Kelly A. Wonder
Analysis of a Hmong Mythical Figure: Chi You (Txiv Yawg)

During an intensive three weeks visit in Yunnan Province, China, I explored the story of the mythical king, Chi You (Txiv Yawg), mentioned in Hmong’s history as the uprising Hmong king. In the 1990s, early Hmong scholars suggest that Hmong’s king in China is the Chinese Miao’s king, Chi You. While some Hmong American communities believe this story, some communities hesitate on the validity of the story. The oral tradition and beliefs behind Chi You’s story was
questioned within Hmong-Chinese communities to address Hmong American’s critique of Chi You as the Hmong king. Using a qualitative approach, we visited 16 Hmong-Chinese communities in which 10 were interviewed in focus groups. Participants were questioned about their ancestors and historical stories on Chi You. The research compares the (Miao) Hmong-Chinese perspective and knowledge of this figure with Hmong-American’s and Hmong scholars’ analysis. Findings suggest that Chi You remains a myth and further in-depth field research is necessary to better understand Chi You’s role in Hmong history.

Chee Yang (253)
Faculty Mentor/Collaborators: Ezra J. Zeitler and Kelly A. Wonder

War and Peace of the Hmong and Chinese

The goal of this study was to learn about the relationship between the Hmong and the Chinese. My aim was to discover how the relationships influenced war and peace within the majority and minority communities. Specifically I wanted to look at the present relationship between the Han and Hmong, and use of the term Miao. Using a qualitative approach, I interviewed Hmong groups in ten villages throughout Yunnan Province to gather their perspective on Hmong and Chinese past experience. While the rural Hmong initially suggested the relationship with the Chinese was strong, additional questioning proposed the relationship may be strained. In contrast, urban Hmong who have integrated into the Chinese mainstream society feel more involved with the Chinese. This suggests that cultural differences may play a role in the relationship between the Hmong and Chinese continues today.

GEOGRAPHY AND ANTHROPOLOGY

Amy Elizabeth Bartel (186)
Faculty Mentor/Collaborator: Joseph P. Hupy

Landscape Analysis on the Results of Least Cost Paths vs. Real World Paths

This research looks at the results of a competitive navigation activity completed by students in a Military Geography class using various landscape analysis techniques. The goal of the activity was to locate and capture six points before the other team on a predetermined navigation course. Teams of students were provided various forms of geospatial data designed to help them develop a winning strategy for the field event. Primary data sources consisted of aerial imagery, soil databases, hydrographic, and elevation information. During the activity each student was given a GPS that tracked their paths. Using these paths, a post-activity landscape analysis was performed that compared a computer generated path, a.k.a least cost path, to the actual paths each squad took in order to determine if the squads’ preliminary analysis and use of terrain was to their advantage. After looking at the results, it would appear that most squads did not follow the least cost paths, meaning they did not utilize the land to their advantage. This research emphasizes how utilization of geospatial technology, in conjunction with basic geographic knowledge, improves the ability to conduct thorough landscape analysis.

Kory N. G. Dercks (190)
Faculty Mentor/Collaborator: Ezra J. Zeitler

Minor League Baseball Stadiums and Urban Redevelopment in Mid-Sized American Cities

As America’s cities grow older and outward through suburbanization, many cities are looking to revitalize their downtowns. One method has involved city officials and owners of Minor League Baseball teams working together to spur redevelopment by building stadiums downtown with the hope that the stadiums will stimulate economic success with new housing and commercial expansion. This mindset reflects a change in ideology over the past two decades, as new stadiums were previously being built in suburbs. This research investigates the changes within the neighborhoods of fifteen cities with recently opened stadiums between 2000 and 2011 through a number of geographic methods. Remote sensing techniques are utilized to examine land use change, GIS is employed to analyze temporal change in the demographics of the neighborhoods, and finally, geographic modeling is used to portray common themes, successes, and failures among the sample of cities building a stadium as a method of downtown revitalization.
Meghan Anne Kelly (189)
Faculty Mentor/Collaborator: Ryan D. Weichelt

Does Geography Matter? A Regional Analysis of Variance Using ACU and ADA Indexes for U.S. House of Representa-
tives, 1981-2009

The polarization of politics and perceived political party influence have dominated recent literature concerning the roll
call voting of Congressmen in the United States. Literature concerning the subject, however, has neglected the influence
of geography on Congressional voting patterns. This research investigates whether U.S. House of Representative voting
records are influenced greater by party and ideology or region. Roll call voting data was collected from two grassroots
lobbying organizations: American’s for Democratic Action (ADA) affiliated with liberal analysis and American Conserva-
tive Union (ACU) affiliated with conservative analysis. The two lobbying organizations assign an index rating to a rep-
resentative based on voting history to determine how liberal or conservative that representative might be. ACU and ADA
ratings were collected for each member of the House from 1981-2009. Dummy variable multivariate regression analyzed
polarization with two categorical variables: region and party affiliation. In the past, roll call voting was heavily influenced
by the region from which that representative resided in. Over time, region has become less predictive of member voting
and political party affiliation has become highly predictive of member voting contributing to the literature on the polariza-
tion of politics and the influence of geography.

Der Lee (252)
Faculty Mentor/Collaborator: Ezra J. Zeitler

Relationships between Hmong and Neighboring Ethnic Groups in Yunnan Province, China

Hmong American oral history states that Hmong and Chinese did not get along back in China, which led to the diaspora
of Hmong settling in the Southeastern Asia during the 19th century. In the United States today, many Hmong American
parents are against interracial dating and marriage. With my understanding of those two views, I sought to explore the
relationship between Hmong people and Han and other neighboring ethnic groups in China. For three thrilling weeks, I
researched the degree to which Hmong peoples in eastern Yunnan Province engage in interethnic relationships by inter-
viewing many elder folks in nine Hmong villages and learning about their thoughts and opinions of dating and marrying
outside of their group. I also noted their interactions with neighboring non-Hmong who visited the village. Hmong in the
area of study view interethnic dating and marriage to be very beneficial due to the struggle of living in remote mountain
communities with little access to electricity and economic development. This is contrary to the prevailing attitudes of
many Hmong American parents, who prefer intra-ethnic relationships because of fear of losing Hmong identity in a differ-
tent part of the world.

Andrew Kenneth Peterson (204)
Faculty Mentor/Collaborator: Ryan D. Weichelt

More Than Just Yard Decorations: Campaign Signs as a Predictor of Election Results and Voter Turnout for the 2012
Presidential Election in the City of Eau Claire

There are many formal indicators of voter turnout, but many of these methods take place after an election has already
occurred. What if a person wanted to get a baseline of how politically active a neighborhood will be prior to the election?
This project will attempt to answer this by employing the use of a Global Positioning System (GPS) to plot campaign
signs for the Presidential Election of 2012 in the city of Eau Claire, WI. By selecting largely populated wards with high
numbers of campaign signs, the hope will be that the greater the sign count in a neighborhood, the higher voter turnout
will be. The GPS data will be laid over the actual election data to see how accurate these signs can be as a predictor of
voter turnout and who the ward voted for. Spatial regression will also be done to determine if the amount of signs in a
ward for a particular candidate is indicative of how that location will vote in the election.

Joseph Anthony Quintana, Kory N. G. Dercks, and Zachary Howard Womeldorf (171)
Faculty Mentor/Collaborator: Ezra J. Zeitler

Wisconsin Fandoms: A Spatial Survey

Geographers study the earth’s surface and the people, places, and processes that shape it. Maps are a tool used by geog-
raphers to analyze geographic data for locations and patterns. This project incorporates Human and Cultural Geography,
and aims to create a visual representation of sports fans in Wisconsin. This project examines the geographic patterns of
people’s preferences for professional sports teams present in the state of Wisconsin. This will be explored by creating an
online survey that will be sent out to University of Wisconsin Eau Claire students, faculty, and the greater community.
Information for the survey includes: zip code of their hometown, age, gender, state in which they were born, as well as their favorite and rival teams in the NFL, MLB, NHL and NBA. After the conclusion of the survey, the zip codes of the responses will be mapped within the state of Wisconsin. We will be looking for trends such as areas in the state where fan bases slowly ‘melt’ into another team’s category (e.g., where Milwaukee Brewer fans start to ‘melt’ into Minnesota Twins fans.) Results will help us better understand the relationship between distance (from sports hubs) and the amount of loyalty fans feel.

Miriam Celeste Russell (203)
Faculty Mentor/Collaborator: Ryan D. Weichelt
A Spatial Analysis of Musician Locations in Metropolitan United States

For this poster I provide the spatial analysis of musician locations in metropolitan United States based on variables inspired by Richard Florida’s Creative Class theory. This theory maintains that cities that rate highly in indices for talent, technology, and tolerance have boasted high rates of music. Musical products for metropolitan areas are the result of interaction between high technological creativity and musicians, and although plausible, Florida’s proposed relationship has been under consideration. From this assessment arise new variables. It has been stated that it is not necessarily the creative class that influences the musician location within metropolitan areas, but rather the availability of musical venues and other centers of musical creation on which musicians depend. Maps displaying the two sets of variables will be provided for spatial analysis. Maps provide a method of testing one well-known theory as an approach to the creation of a new, and possibly a better defined theory on musician locations in metropolitan areas.

Shandi Nicole Siegl (202)
Faculty Mentor/Collaborator: Ryan D. Weichelt
Exploring Wisconsin’s Aging Counties

As the Baby Boomer population enters the retirement and impending retirement age groups, the question of concern is where they are choosing to settle down. The area of interest is Wisconsin counties with a focus on which counties are attracting the highest percentages of retirees and impending retirees. Comparing the median household income of those counties, it was expected and shown that the highest percentages of retirees are in the counties with lower median household income. It was also learned that there are smaller percentages of impending retirees in most counties. With such a large population entering retirement, there is a need to look into what pull factors can be implemented to attract these age groups back to Wisconsin counties to boost/maintain economies from the higher disposable income created by the large cohort of retirees.

Ellen Elizabeth Sorenson (159)
Faculty Mentor/Collaborator: Joseph P. Hupy
Geospatial Analysis of the Wisconsin Honey Bee

This research is a response to the outbreak of Colony Collapse Disorder (CCD) that hit the United States in 2005. We focus on the health of Wisconsin apiaries, with regard to differences in rural and urban environments. 60 beekeepers responded to a 48 question survey measuring qualitative and quantitative information. Survey data was then used in conjunction with Geographical Information Systems (GIS) and the North American Statistics Service (NASS) crop cover data to create maps used to determine how hive health might relate to crop cover. We looked at overall honey yield, honey yield per hive, overall losses, types of honey bees, infestations etc. Our research’s use of geospatial technologies to assess the health consequences of hive locations sheds light on the human-environmental interactions and regional factors from which we draw our conclusions. This research focuses on the influence of apiary size and proximity to urban environments in relation to the overall health of honey bee hives in Wisconsin.

Nou Vue (256)
Faculty Mentor/Collaborator: Ezra J. Zeitler
Oral Tradition in Yunnan Province Hmong Communities

Storytelling has been around for ages in order to put forth the morals and values of mankind. This known art has plays a big role in Hmong American households. In order to better understand the roots of my ancestors, I traveled to Yunnan Province, China in July 2012 for three weeks to explore storytelling and its evolution. During the study, I visited 10 villages throughout Yunnan Province and questioned villagers across generations about their understanding of stories, asking those familiar with storytelling to discuss (or share) stories they have heard from their elders. While Hmong Americans
still find this activity to be of importance for aspiring generations, findings suggest that the communities in Yunnan are no longer practicing storytelling as a form of entertainment. Future research should consider the Hmong diaspora from China to Southeast Asia and the twentieth-century diaspora from Asia to places like the United States as reasons for the transformation of this tradition.

Kathleen Sarah Wendell (142)
Faculty Mentor/Collaborator: Robert J. Barth Jr.
Comparing Underwater and Land Archaeology

The purpose of this research is to explore the methodology, goals and techniques used in land-based and underwater archaeology. The research primarily focuses on three main aspects of the archaeological process: Survey, Excavation and Conservation. As previously stated goals, methods and techniques used in each of these processes will be explored through underwater archaeology and then compare back to traditional land archaeology. The project will look specifically at the goals of each process individually and how archaeologists adapt their methods and or techniques for an underwater environment. After some preliminary research the main question being asked by this project is whether or not the change in environment is the only critical difference between underwater and land-based archaeology. From that, one can ask whether or not underwater archaeology should be thought of as a subfield or as just archaeology.

 MANAGEMENT AND MARKETING

Ellen Jo Pratt (130)
Faculty Mentor/Collaborators: Rama Yelkur and Rebecca Wyland
Work Life Balance and Implications for Business Process Outsourcing in India

The purpose of our research was to study the characteristics of the impact business process outsourcing (BPO) had on Indian culture, customs, and lifestyles. We conducted approximately sixty in-depth interviews at four companies that engage in business process outsourcing through information technology-enabled services. Outsourcing has had significant cultural impacts on the Indian society such as language, identity, gender and the emergence of the western lifestyle. As the Indian BPO industry mainly serves western countries, employees are provided with opportunities and training in understanding the culture, accent, and customs of the client countries. In this way, call centers have been crucial in providing millions of Indian youth working in call centers more exposure to the western culture. This gives them a different perspective about the western way of life (Pradhan and Abraham, 2005). Although the Indian BPO industry has grown to a 30 billion dollar industry today, there is significant employee attrition among Indian BPO firms (Sengupta and Gupta, 2012). The major issues that have been under-researched in the area of the BPO industry in India are related to human resource implications, socioeconomic impact on the country and the types of companies engaged in BPO work.

Samuel Edward Roedger and Samuel Edward Roedger (131)
Faculty Mentor/Collaborators: Rama Yelkur and Julia R. Pennington
Work Life Balance and Implications for Business Process Outsourcing in India

Companies large and small are increasingly outsourcing their business processes through external third party providers commonly referred to as Business Process Outsourcing (BPO). Over the last 15 years BPO markets have grown at a fast pace internationally, partly forced by globalization in order for multinationals to remain competitive. India produces under a million IT professionals and over a million engineers annually and has been a popular destination for BPO and a leading provider of such services. This project addresses a major issue of globalization, that is, how do work life balance issues of employees in BPO industries in India have implications for U.S. companies? A survey of supervisors and direct reports in BPO companies in India in industries ranging from consumer grocery products to accounting services was conducted. Over 200 employees were surveyed from four companies and the results are reported and implications for management and U.S. companies are discussed. The extensive information that was collected through these surveys adds to the literature on BPO, especially the personnel implications, the consequent impact on the productivity of U.S. partners in India, the future of BPO and choice of countries for BPO activities.
Siqi Wang (110)
Faculty Mentor/Collaborator: Rebecca Wyland
External Collaborator: Xiaoyan Su, International Business School, Jinan University, China
*A Model of School, Work and Family Facilitation in a Chinese Context*

For the last decade, a large number of workers in China have been seeking to obtain graduate degrees due to job market pressures (Hays, 2012). The part time graduate program tends to be a popular option for individuals who are already in the workforce (Yu, 2011). Thus, the importance of studying the interdependence of the work, school and family domains is merited. The goal is to conduct a longitudinal study and develop a model of work-school-life facilitation. We suggest that social support resources from employers, schools and families have a positive influence on work attitudes and performance. Further, we suggest that dual-role facilitation mediates the relationship between social support and work outcomes. Specifically, we examine facilitation between school and work, school and family as well as work and family. This research consists of three steps: First, approximately 200 working graduate students who are enrolled in a Chinese University will complete three surveys over the course of the semester (approximately 4 weeks apart). Then the students will be asked to send their supervisor a link to a job performance survey. We plan to use multiple regression analysis and the Sobel test to test our mediation model.

**PHILOSOPHY AND RELIGIOUS STUDIES AND ADVISING AND NEW STUDENT INITIATIVES**

Tara Lynne Wright, Stephan Paul Janke, John Darrel Glaunert, and Marsha Suzanne Hermanson (158)
Faculty Mentor/Collaborators: Rita Lauck Webb and Stephen J. Spina
*Faith in Action: Building Social Cohesion through Interfaith Service in Sri Lanka*

The significance of religion as a social and political force has grown more pervasive and persuasive on both national and international levels in the last decade. While it can arguably be considered one of the most potent sources for human good, its use for polarization, conflict, prejudice and hatred is well documented and on the rise through various forms of religious fundamentalism. International Fellows Program funding supported a 3-week research and service immersion experience in June 2012 to explore the potential social and political strengths of religious pluralism in the post-war context of Sri Lanka, where expressions of all the world’s major religions are present. Using the qualitative action research tool of Participatory Photo Mapping, the team studied perceptions of the impact on inter-religious relationships of shared efforts to alleviate social needs, how faith traditions motivate social action in the world, and what commonalities exist across varied sources of religious authority. They participated in village service projects with the country’s largest indigenous and interfaith social service organization in Sri Lanka and interviewed religious and community leaders to identify factors or obstacles working to undermine the ideal of interfaith cooperation and long-term peaceful coexistence in Sri Lanka.

**POLITICAL SCIENCE**

Ian Eliot Keats (70)
Faculty Mentor/Collaborator: Justin W. Patchin
External Collaborator: Sameer Hinduja, Florida Atlantic University
*Sexting: Child Pornography or Innocent Courtship Ritual? A Review of Relevant Caselaw*

The use of cell phones by adolescents has continued to grow over the past decade: approximately seventy-five percent of teenagers have cell phones. With this increase in access, a new area of concern has developed. Sexting, or the act of taking nude or semi-nude videos or pictures and sending them to another person via cell phones, instant messaging programs, social networks, and video chat, is becoming more recognized by lawmakers as an issue that needs to be addressed. What some teens fail to realize is that the act of sexting is actually deemed production and distribution of child pornography which comes with it serious legal and social consequences. This research project analyzes, compares, and contrasts laws passed by various states to address this issue. These data were then separated and recorded in a table of common characteristics and attributes of the different laws, followed by individual summaries of each law. The majority of state laws regarding sexting view it as either a misdemeanor offense and/or attempt to address the issue by compelling these teenagers to attend educational or counseling programming designed to instruct the adolescent on the potential consequences associated with sexting.
PSYCHOLOGY

Courtney Krisann Allen (51)
Faculty Mentor/Collaborator: Angela G. Pirlott
Understanding Stereotype Threat: Testing Competing Mechanisms

Stereotype threat: Knowledge that one might be stereotyped while engaging in a stereotype-relevant task (e.g., academic tasks for African Americans) can hinder one’s performance, thus causing them to confirm the stereotype—rather than the stereotype actually being true (e.g., that African Americans are less intelligent; Steele & Aronson, 1995). Social facilitation: the mere presence of others enhances performance on simple tasks yet impairs performance on difficult tasks (Gilovich et.al, 2011). The purpose of this study is to differentiate between stereotype threat and social facilitation underlying African American’s performance on academic tasks. To test this, African American and Caucasian adult subjects completed an easy or hard online math test; the experimental group believed that they were being evaluated. The presence of others should hinder performance on the difficult test but enhance performance on the easy test for Caucasians, showing support for social facilitation. The presence of others should decrease performance on both the easy and hard math tests for African Americans due to stereotype threat. Thus, the goal of this study is to tease apart social facilitation and stereotype threat as mechanisms underlying African American’s performance on academic tasks.

Cody Butcher, Alejandro J. Delapena, and Hemapreya Selvanathan (10)
Faculty Mentor/Collaborator: Jeffrey A. Goodman
Religious Affiliation Predicts Prejudice and Prosocial Behavior

The relationship between religion and prosocial behavior is extremely complex. On one hand, believers, when compared to nonbelievers, are more willing to provide help to people or organizations within their belief. On the other hand, believers tend to express higher levels of prejudice than nonbelievers. We conducted a survey in hopes of disentangling this complex relationship. Participants completed measures of religious beliefs, distinguishing them between quest, fundamentalist, and intrinsic religiosity, as well as measures to establish helping beliefs, and prejudice toward different minority groups (gay men and lesbians, Muslims, blacks, and women who have had an abortion). They also indicated the likelihood that they would help individuals from each of these groups. We predict that quest-oriented believers will evidence the least amount of prejudice, while intrinsic-oriented and fundamentalist believers will evidence unique patterns of higher prejudice toward specific minority groups. Our findings may provide novel theoretical and practical contributions to our understanding of the complex relationships between religion, prosocial behavior, and prejudice.

Reese Butterfuss and Marta Louise Rusten (50)
Faculty Mentor/Collaborator: Angela G. Pirlott
Understanding the Sexual Prejudices of Sexual Orientation Minorities

Previous research has investigated the sexual prejudices of heterosexuals toward non-heterosexuals, but the prejudices of sexual orientation minorities have been underrepresented in psychological research. This research utilizes an affordance-management perspective, which suggests that people perceive and interact with those around them in ways that better manage the perceived threats and opportunities (i.e., stereotypes) these others afford. The goal of this research is to understand the stereotypes underlying the sexual prejudices of non-heterosexual men and women toward gay/lesbian, bisexual, and heterosexual men and women. To better understand the reasons why gay/lesbian and bisexual men and women have sexual prejudices towards different sexual orientation groups, non-heterosexual men and women generated reasons for why they both like and dislike different sexual orientation groups. These reasons will be used to generate different threat and opportunity stereotypes, which will then be implemented in a subsequent study to determine which stereotypes drive sexual prejudices of sexual orientation minorities. The importance of this research lies in its potential for a deeper understanding of the underpinnings of sexual prejudice, and a better understanding of any problem is a fundamental step towards a solution.

Bryan Andrew Donovan, Danielle Elizabeth Ryan, and Eric Michael Hanley (44)
Faculty Mentor/Collaborator: April L. Bleske-Rechek
The Value of a College Education: A Longitudinal Study of Science Literacy

Science literacy refers to knowledge of fundamental scientific facts, understanding of the scientific process, and understanding science’s impact on society. Given the increasing importance of science literacy for informed civic decision-mak-
ing, researchers have championed science literacy in America, and exposure to college-level science coursework has been credited for America’s relatively higher science literacy compared to other countries (National Science Board, 2010). We conducted a longitudinal study to determine whether undergraduates experience gains in science literacy as they progress through college. We surveyed 200 students from across campus in the fall of 2009 and again in 2012. At each time point, we assessed science literacy: knowledge of evolution, genetics, biology, inorganic sciences, and scientific and probabilistic reasoning. Overall, students showed limited but statistically significant gains in biology literacy (3%), scientific reasoning (7%), and probabilistic reasoning (10%). Over 1/3 of students either decreased or showed no gain in composite science literacy. Unexpectedly, students in the sciences did not out-perform other students. Our findings coincide with findings from other research (Arum & Roksa, 2011; Blaich & Wise, 2011) and undermine the assertion that college-level science coursework leads to gains in science literacy.

Cora L. Fox and Talia Ann Crabb (71)
Faculty Mentor/Collaborator: Angela G. Pirlott

Threat Detection in Criminal Faces

Are humans able to accurately perceive others as threatening with a single glance? Do criminals have scarier faces than non-criminals? Do we perceive aggressive criminals different than non-aggressive criminals? If the criminal is smiling, is he/she no longer perceived as threatening? To examine whether we perceive threat differentially depending upon type of criminal and whether this perception differs as a function of facial expression, UWEC undergraduates viewed faces that were either criminals (aggressive or non-aggressive) from the state of Florida’s criminal database or non-criminal faces from online photos. We also manipulated the expression on the face: smiling, scowling, or neutral. Participants rated the faces on how threatening they appeared based on three characteristics; friendliness, trustworthiness, and aggressiveness. Participants perceived greater threat in criminal faces relative to non-criminal faces, and scowling faces as more threatening than smiling or neutral faces. This suggests person perception can be applied in the use of threat detection in order to avoid possibly dangerous encounters.

Hannah Rose Geis and Brittany Anne Weber (74)
Faculty Mentor/Collaborator: Mary Beth Leibham

Exploring the Relationships Among College Students’ Goal Orientations, Perfectionism, and Academic Self-Efficacy

Goal orientation is an important aspect of motivation and it underlies students’ approaches to learning. Generally, there are two goal orientations: mastery goals and performance goals. Students with mastery goals approach academic tasks with the intentions of understanding the content and furthering their knowledge. Students with performance goals, on the other hand, approach academic tasks with the intentions of obtaining good grades and appearing competent. The current study examined relationships among college students’ goal orientations, perfectionism, and academic self-efficacy. Since each of these constructs likely plays an important role in student learning, we were interested in exploring the potential relationships among them. Approximately 240 college students completed a Qualtrics Survey which assessed their self-reported goal orientations, levels of perfectionism, and academic self-efficacy. We predict that students who report high levels of perfectionism will display higher levels of performance goal orientations than students who report lower levels of perfectionism. We also predict that students who report high levels of academic self-efficacy will report higher levels of mastery goal orientations. Finally, we predict that perfectionism and self-efficacy will be negatively correlated. Understanding the links among these constructs could help college instructors create learning environments that promote mastery orientations.

Carissa Marie Gutsmiedl and Kathryn Ann Scherber (42)
Faculty Mentor/Collaborator: Blaine F. Peden

Academic Advising Convenience: Undergraduate Perspectives of Alternative Techniques

In college, many students seek guidance for making important academic decisions. A common technique used by undergraduate students is to meet individually with their entitled academic mentor, also known as an advisor. Another alternative technique that some schools are beginning to adapt is the online advisor, which is a web-based program that provides information and resources to help students with general academic issues. The purpose of this study is to evaluate student views on the effectiveness, efficiency, and satisfaction of online and in person advising. To test this, we will provide an online survey where participants will view a short video on the two types of academic advising. Then, participants will be randomly assigned either to the online or in person advising conditions. Participants will make judgments (very inadequate to very adequate) on how appropriate the techniques are for solving situation of general education, declaring a major, and internship issues. We predict that students will view in person advising as more effective and satisfying, but
less efficient than online advising. One goal is to promote alternative advising techniques that are more convenient for college faculty and students.

Eric Michael Hanley, Danielle Elizabeth Ryan, Jenna Anne Kelley, and Bryan Andrew Donovan (17)  
Faculty Mentor/Collaborator: April L. Bleske-Rechek  
A Longitudinal Study of Young Adults' Plans for Work and Family

Past research suggests that young men and women differ in their plans for work and family, with women more likely to choose careers that will "work around" their family plans. We conducted a longitudinal study to determine whether progression through college has an equalizing influence on men's and women’s prioritization of career and family. We surveyed 200 students in 2009 and again in 2012. Our analyses revealed that sex differences in educational aspirations at Time 1 diminished by Time 2, due partially to increased aspirations among women. Men and women were similar at both time points in the number of hours they would ideally work per week, and the majority of men and women desired marriage and children. However, the sexes differed in their plans for balancing work with family. Women planned to work fewer hours per week upon having children than men did, and women expected their partner to work more hours per week than men expected their partner to work. These sex differences were large at both time points, with neither sex experiencing change over time. We discuss our findings in the context of evolutionary perspectives on gender differences in parental investment and status striving.

Shaina Heimerl and Shaelyn Rae Schoen (77)  
Faculty Mentor/Collaborator: Catya von Karolyi  
Reducing Gender Differences on the Mental Rotation Test

Academic and career success in the Science, Technology, Engineering, and Mathematics (STEM) domains is strongly associated with mental rotation ability (Wai, Lubinski & Benbow, 2009). Males are overrepresented and females under-represented in these domains (Ceci, Williams, & Barnett, 2009). Males also outperform females on tests of mental rotation (i.e., Linn & Petersen, 1985). Mental rotation is the ability to visualize a 3D object rotating around its axis (Shepard & Metzler, 1971). Generally, improvement in mental rotation skill translates to improvement in STEM domain performance. Successful attempts to reduce the gender gap in mental rotation performance have included manipulations of (a) the character of the stimuli (i.e., Alington & Leaf, 1992); (b) training methods (i.e., Terlecki, Newcombe & Little, 2007 ); (c) and the length, duration, and timing of training (i.e., Jansen, Lange & Heil, 2011). Our limited review of the literature suggests that there are, indeed, ways to reduce the gender gap in mental rotation ability. Additional research is needed, however, to determine the most effective approaches, as well as to determine whether the resultant improvements in mental rotation skill actually translate to improvements in STEM domain performance and thus, in turn, reduce the gender gap in STEM domains.

Amy Renee Johnson, Mark Aaron Vanden Avond, Elizabeth Joann Hendrickson, Taylor Jane Vossen, Dillon Joseph Nemec, Andrew Timothy Schultz, Bailey Gomer, Carlee Ann Toddes, and Krystal Ann Reed (102)  
Faculty Mentor/Collaborator: David C. Jewett  
Does Delay Length or Sequence Exposure Affect Repeated Acquisition Performance?

We are using a repeated acquisition task to develop an animal model of learning and memory. In the repeated acquisition task animals must emit a sequence of responses to earn food reinforcers. Sequences may include one response on each key, for example right, left, center or multiple responses on a single key such as right, left, right. Incorrect responses result in a delay where the lights are turned off and responses have no consequence. The correct sequence is changed daily and subjects can earn up to 60 reinforcers in a 45-min session. After several exposures to different sequences, stable learning curves may develop with more errors at the beginning of the session and fewer errors at the end of the session. The development of these learning curves may be affected by factors such as delay length and frequency of sequence presentation. In the current study, learning curves were first established with a 2s delay after an incorrect response. The delay was then changed to 5s and learning curves were reestablished for each subject. Subjects were also separated into two groups and trained on either 12 or 6 sequences to evaluate the effects of frequency of sequence presentation.
Katie Lynn Johnson (23)
Faculty Mentor/Collaborator: Jennifer J. Muchlenkamp
Feminist Identity in Relation to Non-Suicidal Self Injury and Disordered Eating

There is evidence that a feminist identity provides some protection against body dissatisfaction, promotes more satisfying romantic relationships, and helps women to feel better about their lives in general, perhaps because feminism empowers women to reject oppressive messages, assert their opinions, and voice their desires. Objectification theory proposes that the objectification of women’s bodies causes women to self-objectify, that is, adopting an outsider’s view of themselves. Engaging in a high amount of self-objectification is thought to place women at increased risk for mental health problems such as body dissatisfaction, self-harm, and disordered eating. However, the intersection between a feminist identity and self-objectification has not been studied in much detail. The objective of this project was to examine the relationships between feminist identity, perceived social pressures, self-objectification tendencies, self-harming behaviors, and disordered eating. It is expected that survey data will show an interaction between feminist identity and self-objectification, such that students who have a strong feminist identity will show lower levels of self-injury and disordered eating regardless of self-objectification levels (i.e., feminist identity will be protective) compared to those who have a low feminist identity. The results should offer new insights that contribute to understandings of how feminism and psychology interact to influence self-harm behavior among women.

Paula Marie Johnson, Rylee Robin Engum, Lucia Weg Fernandez, and Samantha Nicole Klasek (72)
Faculty Mentor/Collaborator: David S. Leland
Binge Drinking at the University of Wisconsin-Eau Claire

The Centers for Disease Control and Prevention reported that in 2010, 18-24 year olds were the age group with the highest prevalence of binge drinking, and that Wisconsin had the highest rate of binge drinking in the United States (CDC, 2012). Because binge drinking is responsible for over half of the deaths associated with excessive alcohol use in the U.S., this suggests that the drinking habits of Wisconsin college students constitute an important topic of study. From an initial sample of 775 respondents, data from 712 representative UWEC students (age 18-27) were examined for drinking-related attitudes and behaviors. Students reported amount and frequency of alcohol consumption, as well as emotional problems and risky behavior associated with drinking using the College Alcohol Problems Survey (CAPS). Respondents also reported their alcohol beverage preferences and familial drinking habits. The survey findings provide a valuable perspective on the relationship between drinking patterns, preferences and problems on campus. For example, CAPS scores were positively correlated with number of drinks consumed on one occasion within the past 30 days. Benefits gained from this research include raising awareness of binge drinking-related issues on the UWEC campus.

Jenna Anne Kelley (15)
Faculty Mentor/Collaborator: April L. Bleske-Rechek
Birth Order and Personality: A Within-Family Test of Cultural Lore

Assumptions about the effects of birth order on personality abound in popular culture, self-help books, and the scholarly literature. In accord with past research and current theory that imply limited effects of birth order on personality, we hypothesized that neither adult siblings’ self-reported personality traits nor parents’ reports of those siblings’ personality traits would differ by birth order. We collected Big Five personality data on 92 college students and peer reports on 78 of them. For 69 of the students, a sibling also provided self-report personality data. Finally, we obtained data from parents of 44 complete sibling pairs. We conducted within-family and between-family analyses to investigate effects of birth order on personality. Within-family analyses revealed that neither siblings’ nor parents’ reports of these siblings’ self-reported personality traits differed systematically as a function of birth order. In addition, between-family analyses revealed that peer reports of firstborns and peer reports of laterborns did not differ. Our findings on the lack of an effect of birth order on personality are consistent with results from previously conducted between-family designs. They also provide further evidence, employing a within-family design that utilizes data from multiple family members, that birth order does not have enduring effects on personality.
Binge drinking is responsible for over half of the deaths and economic costs associated with excess alcohol consumption (Centers for Disease Control and Prevention, 2012), yet little research has been conducted on its association with brain activity. Electroencephalogram (EEG) activity in the beta range (8-12 Hz) is associated with increased arousal and attention. Previous research has shown higher beta amplitude at rest in high bingeing subjects than in non-bingeing drinkers. The current study seeks to replicate these findings and extend them by comparing beta intensity during exposure to full alcohol beverage containers. Alcohol stimuli are expected to increase beta activity, especially for high binge drinkers and those who report higher alcohol craving in response to these stimuli. Preliminary findings suggest that craving ratings in response to alcohol stimuli are higher than those to non-alcohol stimuli. This research has meaningful implications for our understanding of the relationship between attention, alcohol-related media, and drinking behavior.

This study examined college students’ attitudes toward and knowledge of disabilities. To date, research on attitudes toward disabilities has focused primarily on children’s and adults’ attitudes, with little attention given to the college student population. It would be valuable, however, to examine college students’ attitudes since there is an increasing number of students with disabilities obtaining college degrees. College students will also be the next generation to enter the workforce, so they will be the ones to employ and work alongside people with disabilities. Using a Qualtrics survey, the current study examined college students’ attitudes toward and knowledge of disabilities, in addition to their self-reported levels of religiosity. We predict that college students’ attitudes toward people with disabilities will be relatively positive, but their knowledge of disabilities may be indicative of some prevailing misconceptions. We also expect that those participants who report higher levels of religiosity will have more positive attitudes toward disabilities than those who report lower levels of religiosity. Finally, we expect that those who display more accurate knowledge of disabilities will have more positive attitudes toward disabilities than those who display less accurate knowledge of disabilities.

Two studies investigated the degree to which a woman’s face and body independently predict ratings of her full-body attractiveness. In Study 1, women came into the lab as part of a study on friendship, not knowing they would be photographed. With their consent, we took a full-body shot of women as they were (clothes, hair, and make-up) and took anthropometric measurements. We cropped the original photos into two additional photos for each woman: face-only and body-only. Thus, for each woman we had three photos which were compiled into three separate slide shows to be judged for attractiveness by three separate sets of raters at a different university. Similar to previous research findings, women’s faces were better independent predictors of full-body attractiveness ratings than were their bodies. In Study 2, a new set of women came into the lab and were run through the same procedure as in the first study, except that women were photographed in a solid-colored two-piece swimsuit that revealed their body shape and breast size. In Study 2, when cues displayed in women’s bodies were made conspicuous by swimsuits, faces and bodies were both strong, independent predictors of full-body attractiveness ratings.

In general, men are more willing to engage in casual short-term mating relative to women (e.g., Buss & Schmitt, 1993; Schmitt, 2005). However, women’s interest in short-term mating increases after social exclusion (Sacco et al., 2012), suggesting that women might adopt a short-term mating strategy to facilitate social affiliation. The aforementioned study, however, failed to strongly distinguish between friendship and romantic exclusion. Furthermore, one might strategically
respond to social exclusion by adopting a “promiscuous” social affiliation style—creating brief, superficial connections versus a long-term investment style—investing more deeply in fewer social connections, for either friends or romantic partners. To differentiate among these strategies and how this might differ in response to a friendship or romantic social exclusion situation, men and women will indicate their interest in long- versus short-term connections for friends versus romantic partners in response to a friend or romantic exclusion manipulation. We predict that both men and women will adopt “promiscuous” social and romantic affiliation styles in response to social and romantic exclusion.

Michael Joseph Kosiak (41)
Faculty Mentor/Collaborator: Angela G. Pirlott
Understanding Mate Value

Mate value reflects the extent to which one is a desirable mating partner. Although mate value has been widely discussed in the literature, the actual way in which it is measured varies between studies, with most studies defining mate value based upon trait ratings or more general definitions of mate value. Our goal in this study is to add to the mate value literature by first differentiating between long- and short-term mate value; second, examining the extent that specific traits differentially map onto long- versus short-term mate value; and third, identifying the ways this differs for men versus women. For example, we predict that intelligence and kindness strongly predict long-term mate value for both men and women. However, we predict physical attractiveness will load strongly on both long- and short-term mate values for women, whereas social status will load strongly on both long- and short-term mate values for men. To test this, UWEC students will complete mate value measures and trait ratings to determine how particular traits differentially predict men versus women’s long- and short-term mate value. This enables a more accurate description of mate value and how that definition differs for men and women.

Rebecca Jean Lamers (13)
Faculty Mentor/Collaborator: Blaine F. Peden
You Really Just Did That!? Pet Peeves of College Advisors and Advisees

Psychologists study both personal relationships and professional relationships. In college, advisors and advisees typically evolve relationships that blend personal and professional elements in various ways. Like all relationships, both advisors and advisees exhibit “bothersome” mannerisms and behaviors that can influence the nature of the relationship. The researchers deployed the Critical Incident Technique (Flanagan, 1954) in an exploratory study of how advisees and advisors at the University of Wisconsin-Eau Claire view the annoying, bothersome, or irritating behaviors of their counterpart in the advisee/advisor relationship. This study will use methods such as interviews and an online survey through Qualtrics. One goal is to promote an appreciation and understanding of the nature and dynamics of advisor/advisee relationships in college. This can potentially influence and help advisors and advisees better their techniques and behaviors when it comes to the advising process.

Gina Marie Lawton and Hilary Du Bois Stone (21)
Faculty Mentor/Collaborator: Angela G. Pirlott
Ovulation and Condom Use

During ovulation, women are particularly vulnerable to pregnancy. Ovulation has been shown to affect women’s mating behaviors by enhancing attention to attractive men (Anderson et al., 2010) and increasing attraction to symmetrical and masculine men (Gangestad et al., 2007). This supports the “good gene hypothesis” that, given women’s conception risk during ovulation, they will seek mating opportunities with attractive men—men with good genes. Furthermore, ovulation increases women’s likelihood to engage in short term mating with highly attractive men, and without contraceptives, thus elevating the likelihood of conception with attractive men (Baker & Bellis, 1995; Bellis & Baker, 1990). Given what is suggested to be an implicit goal of (short-term) mating with highly attractive men, what effect does ovulation have on women’s explicit condom attitudes and behaviors? To examine this question, undergraduates not using birth control answered questions about condom use and behaviors. We predict ovulation decreases condom-condoning attitudes and intentions relative to non-ovulating women, potentially suggesting that women would be less likely to use condoms during peak fertility, resulting in an increased likelihood of conception.
Katie Rose Lichtblau, Robbi Jean Lindemeyer, and Kally Marie Luck (104)
Faculty Mentor/Collaborator: Kevin P. Klatt
Teaching the Expressive Use of Personal Pronouns to Children with Autism using Video Modeling

Children with autism often have difficulty using pronouns (i.e., my and your) and commonly reverse the appropriate use of them. This purpose of this study was to investigate the use of video modeling to teach personal pronouns to children diagnosed with autism and to examine whether direct expressive response training of pronouns would generalize to correct receptive responses. The use of video modeling as a procedure to correct pronominal errors was of particular attention within this study. A multiple baseline single subject design was used to examine the use of video modeling in the acquisition of expressive use of pronouns and generalization to receptive pronoun responses. Additionally, this study examined the use of pronouns across settings, instructors, and objects. The use of video modeling to teach the expressive use of both personal pronouns “my” and “your” was found to be successful for two of three participants, but was only independently acquired for one participant.

Katlyn Ashley McCormick and Lauren Marie Speckin (16)
Faculty Mentor/Collaborator: April L. Bleske-Rechek
Volleyball Player Competitiveness and Perceived Value to the Team

Youth volleyball is presumed to benefit children by developing their athletic skills, teamwork, competitiveness, and communication; however, very little research has investigated youth development in the volleyball context. We investigated associations among players’ competitiveness, players’ perceptions of their value to the team, and coaches’ perceptions of players’ value to the team. Players completed a 14-item competitiveness scale and a six-item scale of perceived value to the team. Coaches completed a six-item scale on perceptions of value to the team for each of their participating players. Coaches’ ratings of player value and players’ self-perceived value were not congruent, nor were coaches’ ratings of player value correlated with player competitiveness scores. Finally, players who scored high in competitiveness perceived themselves as more valuable to the team. Our findings raise various questions, including whether players who perceive themselves as more valuable actually are more valuable, and whether a lack of congruency between player and coach perception is associated with conflict between players and coaches.

Kaileen Kristin McMickle, Austin Thomas Murphy, and Britney Nicole Shattuck (47)
Faculty Mentor/Collaborator: April L. Bleske-Rechek
Attractive = Smart? The Effect of Men’s and Women’s Attractiveness on Others’ Impressions of their Intelligence

Previous research suggests that people who are attractive are perceived as more friendly, agreeable, and intelligent than people who are unattractive. Given the importance people attach to intelligence for social, educational, and hiring decisions, we designed a study to determine whether attractiveness affects people’s impressions of others’ intelligence. College students viewed faces of (unknown) young men and women who had been previously rated by others as attractive or unattractive. Participants who viewed attractive women did not rate the women as more intelligent compared to participants who viewed unattractive women. However, participants who viewed attractive men rated the men as more intelligent than did participants who viewed unattractive men. The findings of our study have important implications for academic and professional situations, where attractiveness may play a role in how people treat others. Researchers interested in the effect of attractiveness on perceived intelligence may find it beneficial to include participants from culturally diverse areas and different age groups to expand the sample population. To expand even further, future studies could incorporate full-body images to determine if results remain consistent when more than faces are being rated.

Kristen Morgan and Ashley Shipman (19)
Faculty Mentor/Collaborator: Blaine F. Peden
Formal versus Informal Advisees – Inside the Brain of the Advisors

Psychologists study both personal relationships and professional relationships. In college, advisors and advisees typically evolve relationships that blend personal and professional elements in various ways. For example, advisees have a formal advisor assigned to them; however, advisees may adopt a second or informal advisor as well. As part of a more comprehensive study of college advisors and advisees, this study analyzes advisor (or faculty) perceptions of the formal advisor versus the informal advisor. A formal advisor is someone who is the designated academic mentor for an individual student or set of students. In contrast, an informal advisor is someone recruited by a student to assist them within an academic setting, but who is not the formally assigned mentor. The researchers deployed the Critical Incident Technique (Flanagan, 1954) in an exploratory study of the perceptions of undergraduate and graduate advisors at the University of Wisconsin-
Eau Claire regarding formal and informal advisees. We used interviews to compare and contrast how advisors view both formal and informal advisees. One goal was to promote an appreciation and understanding of the nature and dynamics of advisor/advisee relationships in college. This can potentially influence the educational wellbeing of the advisee (or student) while in college as well as help advisors better their techniques when it comes to advising.

**Katelyn Marie Morrison and Luke Dennis Heidtke (14)**
Faculty Mentor/Collaborator: April L. Bleske-Rechek

*Building Blocks of Scientific Psychology: Students’ Understanding of Probabilistic Trends and Correlation-Versus-Causation*

We tested students’ understanding of probabilistic trends and ability to apply the motto “correlation does not imply causation.” We generated scenarios involving two variables that could be studied experimentally or non-experimentally (e.g., video game playing and aggressive behavior), and for each scenario, participants read an experimental or non-experimental research summary. After reading the research findings, students selected statements they thought represented appropriate inferences from the data. Two statements were causal (Variable X leads to Variable Y); two statements were non-causal (People with Variable X tend to have Variable Y). Two statements involved probabilistic reasoning (Any person with variable X will also have Variable Y); two statements involved understanding exceptions to probabilistic trends (If someone has Variable X, but not Variable Y, the results are invalid). Analyses revealed that students who received the non-experimental scenarios were just as likely to infer causation as were students who received the experimental scenarios. Students also were more likely to pick one causal interpretation over another if it seemed more intuitive or fit their pre-existing beliefs. Finally, one in five participants reported that an exception would invalidate the stated trend. Because of these results, we recommend that students need explicit training in interpreting data and reasoning about probabilistic trends.

**Kaija Michelle Muhich, Jessica Hinck, and Alyssa Collura (22)**
Faculty Mentor/Collaborator: Jennifer J. Muehlenkamp

*Parental and Peer Influences on Disordered Eating*

Previous research has shown that poor parental bonding plays a role in the etiology of eating disorders. It remains unclear to what extent parental bonding factors differentially impact risk for disordered eating after other known risk factors, like temperament, peer influences, and body dissatisfaction are controlled. The current study addresses this limitation by examining parental bonding influences on anorexic and bulimic symptoms in a sample of adults, recruited from social/eating disorder websites and UWEC students. To date 124 female and 36 male participants have completed the online survey assessing parenting relationships, temperament, peer attitudes/influences regarding weight, and eating disorder symptoms. Preliminary multivariate analyses indicate that individuals showing eating disorder symptoms score higher on behavioral inhibition and report peers who place a greater emphasis on weight/thinness, and lower on parental care than control subjects, (F = 2.79, p = .007, h² = .152). A logistic regression analysis will be conducted to determine which variables best predict individuals classified as having ‘at risk’ disordered eating symptoms from controls. It is expected that parental bonding will have a greater association with disordered eating symptoms than will temperament or peers. Implications of the findings will be discussed in relation to treatment and prevention.

**Courtney Lauren Mari Nelson (78)**
Faculty Mentor/Collaborator: David C. Jewett

*The Effect of Methotrexate on the Anxiety-like Behavior of Rats*

An elevated plus maze (EPM), a widely used behavioral assay, detects a compound’s anxiolytic (anxiety reducing) or anxiogenic (anxiety inducing) properties. Behavior in this apparatus reflects a conflict between the rodent’s desire for protected areas (enclosed arms of the maze) and their natural tendency to explore new environments (open arms of the maze). The purpose of this experiment was to determine if Methotrexate, a common therapeutic agent, possesses anxiolytic or anxiogenic properties. A floor effect was observed for the amount of time spent in the open arms during the first exposure to the EPM. A second trial was conducted to determine if manipulations in the chosen variables (illumination, light cycles etc.) would increase the open arm exploratory behavior even though a reduction in open arm exploration is typical on the second exposure. No open arm exploratory behavior was observed following these manipulations.
Ashley Marie Niebauer (105)
Faculty Mentor/Collaborator: Kevin P. Klatt
Investigating the Preference for Simultaneous Prompting and Constant Prompt Delay Procedures for Teaching Skills to Children with Autism

This study focuses on determining if children diagnosed with autism demonstrate a consistent preference between two prompting procedures (simultaneous prompting or constant prompt delay) and whether either procedure results in higher skills acquisition for participants. Many young children with autism lack the ability to communicate to therapists; therefore it is difficult for therapists to evaluate the types of teaching techniques the children may prefer. The findings of this study will shed light on how treatment components can be guided by clients despite their lack of ability to communicate. An alternating treatments design is used to evaluate effectiveness and efficiency of the two prompting procedures. A concurrent chains procedure is used to determine what the preferences for the two prompting procedures are for six participants ranging in age from three to nine years old. The terminal goal of the study is to discover the most preferred, efficient, and errorless prompting procedure.

Krystal Ann Reed, Mark Aaron Vanden Avond, Bailey Gomer, Dillon Joseph Nemec, Elizabeth Joann Hendrickson, Andrew Timothy Schultz, Carlee Ann Toddes, Taylor Jane Vossen, and Amy Renee Johnson (103)
Faculty Mentor/Collaborator: David C. Jewett
Effects of Amphetamine in Rats Trained to Discriminate Between 22 and 2 Hour Food Deprivation

Amphetamine decreases food intake in several species. Corwin, Woolverton, and Schuster (1990) trained food-restricted rats to discriminate between food ingested 3 hr or 22 hr before training sessions. In this procedure, amphetamine did not reliably produce discriminative stimulus effects similar to those of recent food ingestion. We tested the effects of amphetamine in non-restricted rats trained to discriminate 22 hr food deprivation from 2 hr food deprivation in a two-lever, operant choice task. After rats acquired the discrimination, subjects were food restricted for 22 hr and administered saline or amphetamine (0.032 to 3.2 mg/kg, i.p.) before generalization tests. Food intake was measured for 1 hr after generalization tests. Amphetamine (0.32 mg/kg) significantly decreased the discriminative stimulus effects of 22 hr deprivation; there is evidence that this effect may be modulated by the age of the animal. Larger doses of amphetamine eliminated responding. Amphetamine (0.32 – 3.2 mg/kg) significantly decreased food intake. The findings are consistent with the notion that amphetamine affects feeding stimulated by energy needs, and suggest differences between the two discrimination techniques.

Katie Lee Remington and Robyn Suzanne Wallin (18)
Faculty Mentor/Collaborator: Blaine F. Peden
Formal versus Informal Advisors – Inside the Brain of the Advisees

Psychologists study both personal relationships and professional relationships. In college, advisors and advisees typically evolve relationships that blend personal and professional elements in various ways. For example, advisees have a formal advisor assigned to them; however, advisees may adopt a second or informal advisor as well. As part of a more comprehensive study of college advisors and advisees, this study analyzed advisee (or student) perceptions of the formal advisor versus the informal advisor. A formal advisor is someone who is the designated academic mentor for an individual student or set of students. In contrast, an informal advisor is someone recruited by a student to assist them within an academic setting, but who is not the formally assigned mentor. The researchers deployed the Critical Incident Technique (Flanagan, 1954) in an exploratory study of the perceptions of undergraduate and graduate students at the University of Wisconsin-Eau Claire regarding formal and informal advisors. We used an online survey, through Qualtrics, to compare and contrast how advisees view both formal and informal advisors. One goal was to promote an appreciation and understanding of the nature and dynamics of advisor/advisee relationships. This can potentially influence the educational well-being of the student while in college as well as help advisors better their techniques when it comes to advising.

Danielle Elizabeth Ryan, Eric Michael Hanley, and Bryan Andrew Donovan (45)
Faculty Mentor/Collaborator: April L. Bleske-Rechek
Young Adults’ Mating Attitudes and Ideal Mate Preferences: Limited Change During College

Past research has consistently documented similarities and differences in men’s and women’s mate preferences and attitudes; however, relationship scientists know little about whether these preferences change over time as individuals experience relationships. Research does suggest that college students believe their peers become less oriented toward opportunistic sex and physical appearance as they progress through college (Bleske-Rechek et al., 2009). To determine whether these beliefs regarding change over time are mirrored in reality, we followed a representative sample of under-
graduate students over their college career. We measured their short-term and long-term mating attitudes and their mate preferences using a “mate dollar” budgeting exercise. We replicated previous findings regarding between-sex similarities and differences. For example, men scored higher than women did on short-term mating attitudes and they valued physical attractiveness in a mate more than women did. Women scored higher than men did on long-term mating attitudes and valued ambition and potential for financial success in a mate more than men did. Contrary to students’ shared assumptions about change over time, our longitudinal findings reveal that men and women did not become less sexually opportunistic, nor did men show less emphasis on physical attractiveness in a mate as they matured.

Shaelyn Rae Schoen and Shaina Heimerl (76)
Faculty Mentor/Collaborator: Catya von Karolyi
Reducing the Gender Gap in Mental Rotation

Academic and career success in the Science, Technology, Engineering, and Mathematics (STEM) domains is strongly associated with mental rotation ability (Wai, Lubinski & Benbow, 2009). Males are overrepresented and females underrepresented in these domains (Ceci, Williams, & Barnett, 2009). Males also outperform females on tests of mental rotation (i.e., Linn & Petersen, 1985). Mental rotation is the ability to visualize a 3D object rotating around its axis (Shepard & Metzler, 1971). Generally, improvement in mental rotation skill translates to improvement in STEM domain performance. Successful attempts to reduce the gender gap in mental rotation performance have included manipulations of (a) the character of the stimuli (i.e., Alington & Leaf, 1992); (b) training methods (i.e., Terlecki, Newcombe & Little, 2007); (c) and the length, duration, and timing of training (i.e., Jansen, Lange & Heil, 2011). Our limited review of the literature suggests that there are, indeed, ways to reduce the gender gap in mental rotation ability. Additional research is needed, however, to determine the most effective approaches, as well as to determine whether the resultant improvements in mental rotation skill actually translate to improvements in STEM domain performance and thus, in turn, reduce the gender gap in STEM domains.

Cristina Marie Soto (11)
Faculty Mentor/Collaborator: Jeffrey A. Goodman
Correlates of Academic Achievement Motivation Among Underrepresented College Students

The purpose of our study is to determine the relationships between socioeconomic status, perceived social support, perceived discrimination, stigma consciousness, ethnic group identification, and the academic achievement motivation of underrepresented college students. Psychological scales were used to profile students’ perceived social support, perceived discrimination, stigma consciousness and his or her ethnic group identification. The students’ socioeconomic status was also reported and recorded. Self-efficacy, intrinsic value, and self-regulated learning were measured through psychological scales to identify motivational processes of academic achievement. Additionally, participants’ GPAs supplied another measure of academic achievement. A total of 396 students participated in our anonymous online Qualtrics survey. Upon submitting our variables to a regression analysis, we found that perceived discrimination, stigma consciousness, and perceived social support accounted for 14.3% of the variance in academic achievement motivation. All other variables were non-significant. Results suggest that minority status does not hurt academic achievement motivation for college students. An elusive protective factor is likely working to buffer the disadvantages for minority students and further examination of such a buffer will continue. This research adds pertinent knowledge to the field of psychology in terms of a multidimensional model describing the academic achievement motivation of underrepresented students.

Hilary Du Bois Stone and Gina Marie Lawton (20)
Faculty Mentor/Collaborator: Angela G. Pirlott
Ovulation and Disgust Sensitivity Towards Heterosexual and Gay/Lesbian Sexual Behaviors

The behavioral immune system (Schaller & Park, 2011) is a set of psychological mechanisms designed to detect indicators of pathogenic disease and elicit emotion (disgust) and behavioral responses to facilitate the avoidance of pathogens. How does disgust enable or inhibit sexual behavior? Does this disgust mechanism change in women as a function of ovulation? Given ovulating women are vulnerable to conception and pregnancy, they should be sensitive to avoiding sex with undesirable partners. Accordingly, we examined whether ovulation affects sexual disgust sensitivity to heterosexual and gay sexual behaviors. Undergraduate women not using hormonal birth control rated their disgust to sexual acts between male-female (heterosexual), female-female (lesbian), and male-male (gay). We predict that ovulation will facilitate heterosexual mating but hinder homosexual mating behavior, such that ovulation will increase disgust towards homosexual sexual behaviors but decrease disgust towards heterosexual sexual behaviors, relative to non-ovulating women.
Carlee Ann Toddes and Taylor Nicole Custer (43)
Faculty Mentor/Collaborator: Blaine F. Peden

The Dumb Blonde Effect: How Stereotypes and Needlessly Complex Words are Associated

Our research examined whether exposing participants to images of blonde-haired women caused them to perform poorly on a cognitive task, and whether increasing the difficulty level of the vocabulary in an essay causes an author to be perceived as less intelligent. Our study was a two-factor experiment; the first independent variable was the verbal complexity of an essay and the second independent variable was the exposure to blonde stereotypes. We administered our study through an online survey in which participants viewed pictures of blonde women, read an essay, and then rated both the essay’s complexity as well as how intelligent they believed the essays author to be. Participants rated the author’s intelligence based solely on the content in the essay. There was not a significant main effect between exposure of blonde-haired women and cognitive performance. There was also not a significant main effect of increased difficulty of vocabulary and the perceived author intelligence. This study was important because it not only helped distinguish key factors that affect cognition but it also helped show that stereotype threat is starting to become less prevalent in society.

Olivia Jean Tomfohrde (48)
Faculty Mentor/Collaborator: Blaine F. Peden

External Collaborator: Allen Keniston, Emeritus

Students’ Knowledge About The Ethics Of Teaching

This study examined ethics in teaching. Several studies showed that students have concerns about the ethical behaviors of their professors. Students value professors who show fair grading policies, listen to student concerns and show respect for their class. Students showed little preference for professors who were intimidating, disrespectful toward the class, prejudiced and professors who engaged in sexual relationships with students (Keniston, 1993). Cheating is another major ethical concern for faculty as well as students, and by developing a better understanding of the ethical implications of cheating, policies could be developed to slow academic misconduct. In 2011, we used an online survey to replicate the 1993 survey. We will compare and contrast the 1993 and 2011 data to see what has changed in ethical values and what has remained constant. Our analysis will focus on similarities and differences over 15 years. Having an understanding of what student’s consider ethical and what they value in a professor can help guide professors to develop more effective and appropriate classroom atmospheres.

Mark Aaron Vanden Avond, Krystal Ann Reed, Bailey Gomer, Dillon Joseph Nemec, Elizabeth Joann Hendrickson, Andrew Timothy Schultz, Carlee Ann Toddes, Taylor Jane Vossen, Mackenzie Marie Drengler, Brianna Berti, and Amy Renee Johnson (79)
Faculty Mentor/Collaborator: David C. Jewett

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

Duloxetine is a serotonin and norepinephrine selective reuptake inhibitor. We examined if duloxetine affects the internal stimulus associated with 22 hr food deprivation. Rats were trained to discriminate between 22 hr and 2 hr food deprivation in a two-lever, operant choice task. After rats acquired the discrimination, subjects were food restricted for 22 hr and administered saline and duloxetine (3.2-17.8 mg/kg, s.c.) before generalization tests. Food intake was measured for 1 hr after generalization tests. Duloxetine (5.6 mg/kg) significantly decreased the discriminative stimulus effects of 22 hr deprivation. Duloxetine (5.8-17.8 mg/kg, s.c.) decreased response rate. Food intake was significantly decreased by duloxetine (10 mg/kg-17.8 mg/kg). Duloxetine affects the internal stimulus associated with 22 hr food deprivation and food intake providing evidence that suggests the serotonin and norepinephrine systems regulate food intake.

Robyn Suzanne Wallin, Katie Lee Remington, and Rebecca Jean Lamers (12)
Faculty Mentor/Collaborator: Blaine F. Peden

Attracted to Your Parent? The Relationship Between Ideal Mate Traits and Parental Traits

Sigmund Freud’s model of mate selection implies that individuals select mates who resemble their opposite sex parent. This study examined variables that influence mate preferences of 220 women. Qualtrics randomly assigned the women to one of two conditions for the first independent variable. All women read about Freudian theory; however, one group read about the Freudian model of mate selection whereas the second group read only general information. Participants then identified their ideal mate traits, and rated their attraction to a series of three different male pictures. The independent variables also included ratings of similarity between self, ideal mate, and father. There was no statistical significance for the between-subjects analysis of variance (ANOVA) of the type of Freudian information participant was exposed to, and
preference of hair type. As for the within-subjects ANOVA for the series of three pictures, and the overall attraction to each, no statistical significance was found. Lastly, there was no statistical significance for the 2x3 mixed-subjects ANOVA of the Freudian information the participant was exposed to and the overall attraction to each picture. For this study, the overall pattern of results did not support the Freudian model of mate selection.

**Brittany Anne Weber** and **Hannah Rose Geis (75)**
Faculty Mentor/Collaborator: **April L. Bleske-Rechek**

*Not Taking Criticism Well: Responses to Constructive Criticism as a Function of Criticism Hostility and Recipient Perfectionism*

The current study was conducted to determine the effect of criticism hostility on defensiveness in response to criticism and the relationship between perfectionism and defensiveness in response to criticism. Past research has found an association between perfectionism and self-criticism, but the current study was designed to explore the possible relationship between perfectionism and response to criticism from others. A sample of 43 male and 168 female college students completed a questionnaire including one of two criticism scenarios, hostile or non-hostile, followed by statements measuring participants’ defensiveness in response to the criticism. The questionnaire also included the Almost Perfect Scale-Revised, which is a measurement of perfectionism. This study defined perfectionism as an individual’s belief that they consistently fail to meet the high standards that they have set for themself. The analysis revealed that participants classified as high in perfectionism were significantly more defensive in response to criticism than were those classified as medium or low in perfectionism. In particular, perfectionism predicted defensiveness when the criticism was hostile as opposed to non-hostile. We discuss the possible implications of our results for enhancing students’ learning environments.

**SOCIAL WORK**

**David Michael Hickmann (82)**
Faculty Mentor/Collaborator: **Lisa Quinn-Lee**

*The Financial Impact of Terminal Illness on Patients’ and Families’ Quality of Life: Perceptions of Hospice Social Workers*

The purpose of this research was to advance the understanding of the financial impact of terminal illness on patients’ and families’ quality of life, as perceived by hospice social workers. The emotional, social, physical, and spiritual dimensions to quality of life are often assessed and discussed. Financial quality of life is also important at the end of life, especially when other stresses are occurring, but is often not studied. In this qualitative study, a purposeful sample of ten hospice social workers at various hospice agencies in Wisconsin were each interviewed for approximately 30 minutes. Interview responses were transcribed, and patterns and themes within the data were identified, analyzed, and reported through thematic analysis. As one participant said, “It’s not all about the money, but it’s always about the money.” This theme of money negatively impacting quality of life emerged throughout the study. Although some health insurance programs cover many end-of-life costs, it is not all-encompassing, and most hospice participants need or want more. Failing to cover services such as custodial care, much of the burden of caring for a dying loved one can fall on the family or individual, thus reducing quality of life at the end of life.

**Randi Nicole Winchester, Carolyn Marie Egan, and Sara Cassat Fathauer (99)**
Faculty Mentor/Collaborator: **Leah Olson-McBride**

*Burnout and Resilience among Human Service Professionals in South Africa*

South Africa has implemented a community development approach for the provision of care to children and families impacted by HIV/AIDS. In South Africa, the Child and Youth Care Worker (CYCW) is one of the primary providers of care to such communities. Many CYCW’s experience multiple losses, high levels of stress, and a lack of access to resources in both their personal and professional lives; however, despite these seemingly insurmountable challenges, they provide high-quality care to clients. The purpose of our research was to develop an understanding of the individual and organizational factors that impact the development of burn-out and resilience among these care providers. The research team traveled to South Africa and collected data via interviews, the Maslach Burnout Inventory, and the Positive and Negative Affective State Inventory from over 150 CYCW’s. Initial results indicate that the level of burnout among CYCW in South Africa is remarkably low. Three specific factors emerged as primary contributors to resiliency: spiritual beliefs; co-worker support; and access to job-specific training. It is hoped that the findings of this study will inform the development of training and support programs for caregivers within community development programs.
Delay discounting is a commonly utilized measure of impulsive choice. This procedure describes how the value of an outcome decreases as its receipt is delayed over time. One limiting factor is that quantifying delay discounting is time consuming, requiring multiple conditions run for several sessions each. The first aim of this study was to examine ways to minimize the number of sessions required to reach stability. A second aim of this research was to compare our delay discounting results with a second measure of impulsivity: the Go/No-Go task. This procedure assesses responding in the presence of a stimulus indicating reinforcement is available (go), and a second stimulus indicating that no reinforcement is available (no-go). Results demonstrated a negative correlation: subjects who were more highly self-controlled as measured by delay discounting actually made more responses during “no-go” periods. This finding indicates that these two procedures perhaps measure different types of impulsivity.

SOCIOMETRY

Katie Ruth McGough (8)
Faculty Mentor/Collaborator: Kathleen A. Nybroten
Influences on College Relationships: Staying Together or Breaking Up?

This study explores long-term dating relationships among college students. Using both open-ended and close-ended survey questions, we test three hypotheses. First, that college students “slide” into committed relationships versus a more intentional decision. Second, that men and women evaluate the reasons for a potential relationship break-up differently. Third, family and friends influence a couple’s relationship quality via support as well as their own relationship dissolution experience. Our results discuss whether there are gender differences in participants’ future outlook regarding their relationship as well as the causes of relationship discord and dissolution for college students. While some may argue that “dating” among college students is a temporary arrangement with few consequences following a break-up, we argue that the study of dating may be more important today since college students could potentially be in these relationships for a significant period of their lives.

Bao Kou Moua (9)
Faculty Mentor/Collaborator: Jeff S. Erger
Role Conflict, Stress, and the Effects of Interaction on Coping for Second Generation Hmong Americans

This study investigates second generation Hmong-Americans’ experience with role conflicts between Hmong cultural expectations and American role expectations. Identity theory predicts a high level of stress produced by role conflict for any second generation American group, but that developing a “blended identity” will lower the negative impact of role conflict. Hmong-American students from the University of Wisconsin-Eau Claire (4 male, 9 female) were interviewed. Analysis was done using NVIVO to code for relevant variables and search for patterns in subject responses. Three themes emerged: Hmong-American students whose parents are more assimilated into American culture have higher Hmong-American identity awareness; those with higher Hmong-American identity awareness display lower levels of stress and more positive coping techniques; and those who are less exposed to Hmong populations growing up display more stress and fewer positive coping techniques. While use of social networking sites seems to help in coping with stress and in the development of a “blended identity”, the data show any source of open communication about being Hmong-American has positive effects. Importantly, exposure to Hmong culture seems to have a positive, not a negative, impact on coping with role conflict and developing a blended identity as Hmong-American.

WATERSHED INSTITUTE

Alana S. Jenkins (218)
Faculty Mentor/Collaborator: Karen G. Mumford
Extracting Values from the Wisconsin Sand Mining Debate

Sand mining has increased dramatically in western Wisconsin due to the use of sand in the expanding natural gas industry. Over 90 mining and processing facilities currently exist or are under review in the region. Although important to the natural gas industry, sand mining has been a source of conflict among western Wisconsin residents. A content analysis of over
300 news articles was conducted to identify the values underlying these conflicts. Articles were selected from newspapers in Chippewa (Chippewa Herald), Dunn (Dunn County News), and Eau Claire (Leader Telegram) counties. Articles were found on newspaper websites and national newspaper databases. A coding dictionary was created and successfully tested for accuracy after reviewing a sub-sample of articles in order to consistently identify and code value expressions. The 300 articles were examined and coded. Preliminary findings suggest that a breadth of values were expressed in articles about sand mining, ranging from economic values to those associated with aesthetics and health. A number of value expressions stemmed from concerns over the lack of information about the positive and negative impacts of these activities. After summarizing key findings, we present the strengths and limitations of news articles as a source for understanding conflict.

**WOMEN’S STUDIES**

*Katrina Rose Leonard (81)*  
Faculty Mentor/Collaborator: **Kathleen A. Nybroten**  
*A Feminist Content Analysis of Bridal Magazines*

This study examines how concepts of gender, race, class, and heteronormativity are presented in modern wedding culture. Using a feminist framework, this study is a content analysis of bridal magazines published in 2012 and 2013. We critically analyze the use of language and visual representations that form a normative culture and valued practices related to weddings. The results provide insights as to how heterosexuality is institutionalized and gender roles are reinforced as well as how the wedding culture reinforces white, middle class consumerism.
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