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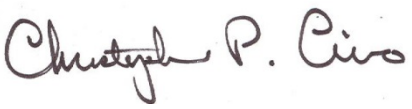
Welcome to the 17th annual College of Letters and Science Undergraduate Research Symposium.

The exercise of scholarship is fundamentally about discovery. As part of this annual celebration, we are proud to share how teaching and scholarship go together in the bond that develops between our faculty and their students. A fundamental role of higher education is giving our students the opportunity to discover the world of inquiry, where there are no simple answers and research naturally leads to more questions. Our faculty, as experts in their fields, whether in the social sciences, the humanities, or the natural sciences and mathematics, are the resource that our students most depend upon in experiencing a successful college career. Their expertise is shared by involving our students in the process of inquiry… the real product of higher education. And that is what we celebrate here today. As I often relate through media and to faculty and students who visit UW-Stevens Point … the *faculty/student relationship* is the most important unit of currency making a difference in our students' lives and expectations. Indeed, it gives them a glimpse into the exciting and often difficult questions posed by our world. In all our activities within the college, we strive to empower our students to question and participate in the process of discovering themselves and the spectrum of disciplines we offer. As teacher/scholars, our faculty are charged with raising the expectations of our students, giving them the intellectual tools needed to become professionals in whatever field they pursue in their careers. This is the forum which most honors that relationship.

Please visit the lectures, demonstrations and posters created by our students working with our faculty. This is the highest impact practice we offer to students as they move on in their exciting professional careers.



Christopher P. Cirmo
Dean, College of Letters and Science
Professor of Geography and Geology

Oral Presentations 2:20-3:10 p.m.

Science Building (A-wing) 1st and 2nd Floors

Group 1
2:20-3:10 p.m. Room A107

Analysis of Aerobic Bacteria and Coliform Populations in an Aquaponic System - (Biology)

By: Michelle Sonsalla
Faculty mentor(s): Matt Rogge
Moderator: Aaron Davis

Aquaponics is an agricultural practice combining aquaculture and hydroponic techniques, resulting in the production of food in a soil-less environment. Fish are fed a high quality diet, and fish waste is processed by biofiltration, which converts nitrogenous waste into nitrate. Plants in separate tanks use the nitrate and other nutrients from the water, which is cycled back to the fish. The result is an efficient and sustainable system for the production of fish and plants. Because water containing animal waste is used to nourish the plants, it is necessary to ensure that the water does not contain microbes associated with foodborne illnesses. In this study, water, plant roots, and plant leaves from a commercial aquaponic system were sampled and analyzed to quantify populations of bacteria throughout the system. Total aerobic bacterial counts were conducted. Coliforms, a group of indicator organisms commonly associated with contaminated water, were quantified using PetriFilm and the most probable number (MPN) method of coliform quantification. Analyses indicate that significantly greater numbers of aerobic bacteria were present on the roots of the plants compared to the leaves or any water samples from the system ($P < 0.05$). Coliform concentrations, however, were similar throughout the system. The data indicate that the water and plants in the system are rich in microbes, but further analyses are required to determine if any of the microbes present a foodborne pathogen risk.

Differences in Parental Care Behavior Between Whooping Cranes (Grus americana) and Greater Sandhill Cranes (Grus canadensis tabida) at Necedah National Wildlife Refuge. - (Biology)

By: Elizabeth Hill, Andrew Sella
Faculty mentor(s): Sarah Alger, Shelli Dubay
Moderator: Aaron Davis

Whooping Cranes (Grus americana) are federally endangered and an experimental population was reintroduced into Necedah National Wildlife Refuge (NNWR) Wisconsin in 2001. Cranes released in the Refuge are born and raised in captivity by people wearing crane costumes. How behavior of captively-raised whooping cranes differs from wild cranes is unknown. Both whooping and greater sandhill cranes (Grus canadensis tabida) in this population breed in NNWR. Breeding begins in April and colts hatch approximately 30 days after eggs are laid. We evaluated parental care of whooping and sandhill cranes after colts hatched but remained at nest sites. We hypothesized that sandhill cranes would care for colts better than captively-raised whooping cranes, using

time away from nest and time spent brooding as indices of parental care. Cameras were placed at nests and took one photo every 5 minutes. Pictures were sorted then individually tagged with behaviors exhibited by the birds at the nest. We are using photographs from 26 whooping crane and 21 sandhill crane nests for comparison. Analyses are ongoing, but we will use the percent time each crane pair spend brooding and away from nest per day in statistical tests. We will use a two-way factorial ANOVA with subsampling to identify differences in behavior by species. Our results will inform management at NNWR regarding parental care of whooping crane colts since colt mortality on the Refuge exceeds 99%.

Group 2
2:20-3:10 p.m. Room A110

Escape Behavior of Side-Blotched Lizards Differs in Response to Predatory Lizards or Snakes - (Biology)

By: Elizabeth Wagner
Faculty mentor(s): Peter Zani
Moderator: Peter Zani

Few field studies have examined responses of prey to multiple predators despite most prey occurring in multipredator environments. Therefore, we studied 10 populations of common side-blotched lizards in western North America that varied from co-occurring with both predatory lizards and snakes to only co-occurring with snakes. We quantified the escape behavior of side-blotched lizards when approached with one of two model predators: a lizard or a snake. We found no difference in flee initiation distance between the model lizard or snake. However, we did find differences between the predator types in terms of escape distance, flee direction, and refuge use. Approach by a predatory lizard resulted in side-blotched lizards tending to flee only short distances before seeking refuge, but running more directly toward that refuge when compared to an approaching snake. Thus, the escape responses of side-blotched lizards are tailored to the type of predator that is approaching even in the absence of that particular predator. These results suggest that side-blotched lizards across the geographic range of this species use a combination escape responses that are both generalized to terrestrial predators as well as contextualized to counter the specific threats of certain predator types.

Harsher Winters Do Not Result in Increased Energy Storage in Side-Blotched Lizards - (Biology)

By: Brady Nelson
Faculty mentor(s): Peter Zani
Moderator: Peter Zani

Previous research has indicated that glycogen stored in the liver is limiting to lizards' overwintering survival. Because winters are typically longer and harsher at higher latitudes, lizards must deal with these harsher conditions across a latitudinal gradient. We explored the idea that lizards may be able to adjust their energy-storage needs, either morphologically or physiologically, in order to meet the energy demands imposed by their environment across latitudes. We hypothesized that both the size and energy content of the livers of side-blotched lizards will increase with latitude to enable survival in

harsher winters. To test this idea, we subjected lab-reared lizards from 12 populations across a latitudinal gradient to conditions that mimicked nature in order to induce normal winter preparation (i.e., energy storage) and then quantified organ size and glycogen content. Results indicate a lack of relationship between either the sizes or glycogen content of livers across latitude. This lack of relationship held true when data were analyzed using all individuals or when we compared population averages. These results suggest that side-blotched lizards do not anticipate winter's onset using either morphological (organ size) or physiological (stored energy) responses along a latitudinal gradient.

Group 3
2:20-3:10 p.m. Room A111

Improving Human Control of Quadcopter Drones and Commercial Unmanned Aerial Systems with Augmented Reality - (Computing and New Media Technologies)

By: Brian Hall, Kierstan Leaf, Nicolaus Anderson
Faculty mentor(s): Tim Krause, Tim Kennedy
Moderator: Tim Krause

The Federal Aviation Administration estimates that there will be more than 30,000 unmanned aerial systems (UAS) flying in US airspace within 15 years. Meanwhile, the NASA Ames Research Center warns that introducing remotely piloted aircraft into non-segregated national air space "could result in easily preventable accidents that may undermine public confidence," resulting in property damage or even loss of life. Research scientists have previously reported serious problems with mechanisms to control UAS systems, and NASA notes that some of these problems cannot be addressed simply by applying existing cockpit design advice to UAS. In this multidisciplinary project between the Computing and New Media Technologies department and Geography/Geographic Information Systems Center, we compare technological methods of remotely controlling and observing commercial quadcopter drones. The value of augmented reality first-person view techniques are explored and compared with traditional radio-control techniques. The experiment features student drone operators in a live indoor environment completing a variety of typical flight operation tasks.

Project MVP: A Mobile Sports Fan Application - (Computing and New Media Technologies)

By: Corey Parris, Brian Hall, Seth Beaty, Anika Sheela
Faculty mentor(s): Tim Krause
Moderator: Tim Krause

The Fantom mobile application serves as a digital historian for sports fans to track games and performances they've seen live, re-live their fan journey, and create a bucket list. Through custom GIS-technology, sports fan can use the app to check-in at games, earn emblems, archive their favorite moments, and ultimately ditch that shoebox full of ticket stubs. Our team worked this semester to develop this application as our minimum viable product ("MVP"). Even with minimal functionality, we created an exciting tool for sports

data analytics. Our database with logged check-ins linked to user accounts enables us to show users unique information and statistics such as: You've witnessed X home runs, strikeouts, touchdowns, three-pointers, triple-doubles, game-winners, etc.; which records you've seen shattered; which stadiums you need to visit in order to complete your "fan conquest"; what percentage of Fantom users witnessed those mutual-moments? Furthermore, we put ourselves in a position to put micro-content behind moments that people experienced live. For example, if Aaron Rodgers throws a game winning touchdown pass, we can send a 10-second video clip to every user that checked-in at Lambeau Field that day. Once we grow user-base, this data becomes very attractive to individual sports organizations. With our help, marketing managers in the front office can customize their conversations with fans, leading to increased engagement, a stronger fan base, and a better experience.

Group 4
2:20-3:10 p.m. Room A112

The Gay Best Friend and Complacent Identities - (English)

By: Chelsea Phillips
Faculty mentor(s): Dejan Kuzmanovic
Moderator: Dejan Kuzmanovic

People generally recognize stereotypes as useless social constructs that offer the most elementary understanding of an entire population. Though often perpetuated in media, most people accept that stereotypical behavior is amplified for effect rather than serious commentary, and it is more or less the case that this exaggerated behavior fades with time and exposure to the real people these portrayals mock. Occasionally, however, so-called "complimentary" stereotypes remain present despite a changing social atmosphere. This has been the case with the "Gay Best Friend," or token gay male character trope that pervades pop culture. More than simply pigeonholing an entire population of gay males as frivolous and fashionable, the trope accepts and proliferates a narrow understanding of sexual identities, while constantly upholding heteronormative values. Incorporating arguments from seminal queer theorists, this paper argues that, rather than a sign of progress and inclusivity, the Gay Best Friend is instead a symbol of popular culture's comprehension of sexuality as rigidly defined by, and engaged in defending, normative sexuality.

Negotiating Social and Sexual Identities Through Projected Narratives and Violence in Passing and The Strange Case of Dr. Jekyll and Mr. Hyde - (English)

By: Paul Grosskopf
Faculty mentor(s): Dejan Kuzmanovic
Moderator: Dejan Kuzmanovic

In Simulacra and Simulation, Jean Baudrillard argues that while static classifications are integral to systems or frameworks (such as science) that govern and set the terms for our everyday lives, these static systems are incompatible with the kinetic qualities of the world they attempt to structure. This paradox comes to define the unreliable narrators of both *Passing* and *The Strange Case of Dr. Jekyll and Mr. Hyde*, Irene and Utterson.

While these two characters differ in the cultures and time periods they live in, along with the positions they inhabit within them, they are strikingly similar in that they each work to both structure and appease their fluid social and sexual identities through constantly engaging with characters that transgress the social norms and fixed definitions of selfhood that they themselves refuse to abandon. In this regard, both Utterson and Irene are simultaneously compelled to connect with and distance themselves from Mr. Hyde and Clare respectively, as a means of both appeasing their desires and adhering to the constructed social and sexual identities that they inhabit. Therefore, as a means of attempting to negotiate this rather tumultuous paradox, both Irene and Utterson project narratives on the objects of their desires and ultimately turn to objectification and violence as a means of enforcing those narratives, which ultimately leads to their mutual devastation in each of the novels' conclusions.

Group 5
2:20-3:10 p.m. Room A201

A Search for a Bijection Between Two Sets of Tableaux - (Mathematical Science)

By: Danial Wentland
Faculty mentor(s): Matt Welz
Moderator: Andy Felt

In this talk we explore and explain some of the connections between two different sets of objects, "Marked tableaux" and "P_(n,2)-tableaux", that play roles in the representation theory and in algebraic combinatorics. In his paper, "Eulerian numbers, tableaux, and the Betti numbers of a toric variety," Stembridge establishes that Marked tableaux give the multiplicity of irreducibles of a representation. Later, in "Chromatic Quasisymmetric Functions and Hessenberg Varieties," Shareshian and Wachs come about P_(n,2)-tableaux in a similar way, and establish indirectly that there is a bijective correspondence between these two sets of tableaux. We present the results of our research thus far which include: a direct combinatorial bijection between these tableaux for certain shapes, a formula for the number of tableaux for other shapes, and summarize the data collected in a variety of cases.

Integer Linear Programming Model for Scheduling Corporate Training - (Mathematical Science)

By: Elise Celarier, Robert Goszkowicz
Faculty mentor(s): Andy Felt
Moderator: Andy Felt

We will present results from an independent study in the Department of Mathematical Sciences, in which we used integer linear programming methods and computer resources to create training schedules for a major corporation. We will display a mathematical model we created which assigns a teacher to a class and location each week, while taking into consideration their credentials, travel restrictions, how often a class must be taught, and other pertinent information. We will illustrate ways of making the model more efficient in dealing with large amounts of data and complex requirements. We will then compare our model's usefulness and efficiency compared to old scheduling techniques.

Group 6
2:20-3:10 p.m. Room A202

Law and Determinism: An Argument Against Retribution - (Philosophy)

By: Hannah Williams
Faculty mentor(s): Joshua Horn
Moderator: Joshua Horn

This paper will bridge the gap between arguments about the existence of free will and arguments about whether criminal justice should be built on a model of revenge. By considering classical and current philosophical stances on determinism, case law, basic legal tenets, and evidence of how to build a successful justice system, I will argue that including retribution in legal considerations is not only not productive, but actively harmful. The urge to punish people for their actions is understandable, and arguably necessary to a functional society. However, it has no place in decisions that are supposed to be rational and beneficial, rather than emotional and spiteful. I do not claim to have an answer to the question of free will, but given that there are very strong arguments against it, and no proof otherwise, there is at minimum a risk in assuming one way or the other. Combined with the underlying legal issues, I therefore conclude that it is both more rational and, ultimately, better for the purposes of society, to avoid a justice system that relies so heavily on motives of revenge.

The Determinants for Internet Censorship in the World - (Political Science)

By: Kyle Ebelt
Faculty mentor(s): Mert Kartal
Moderator: Mert Kartal

Recently, the United Nations has considered access to the Internet a human right. Today, in many countries, the public's access to the Internet is being restricted by national governments more than ever. What factors influence a state's decision to restrict the Internet? My study proposes to answer this question by using statistical data from the POLYCON dataset, the Open Net Initiative dataset, and the 2015 United Nations Global Information and Technology Report. Analyzing several aspects of the Internet from security, to political, to economic aspects of Internet use, I argue that both political constraint/restraint and technological capability affect states' decision to censor the Internet. In addition to preliminary statistical analyses, this argument is also supported by in-depth case studies of Saudi Arabia, China, Turkey, and the United States. Given the "democratizing" influence of the Internet in today's global community, my research is an initial effort to explore alternative ways to help minimize government censorship of the Internet.

Oral Presentations 4:00-4:50 p.m.

Science Building (A-wing) 1st and 2nd Floors

Group 7
4:00-4:50 p.m. Room A107

Exploring Leadership: Experiences from the 2016 National Character and Leadership Symposium - (Psychology)

By: Katie Cronmiller, Sammuel Bruun
Faculty mentor(s): Justin Rueb
Moderator: Debbie Palmer

Our presentation is a summary and analysis of our experience attending the National Character and Leadership Symposium hosted by the Air Force Academy, which we were able to attend after receiving funding through the College of Letters and Science. This year's conference was based around the theme of Professionalism and the Profession of Arms. Over the course of two days, we were exposed to dozens of speakers and presenters, each of whom either shared own experience in leadership and the character development they personally underwent or the impact professionalism has on one's ability to lead and inspire others. Additionally, at the Symposium we were housed with current cadets, providing us a unique opportunity to view an entirely different education style and discuss leadership and professionalism with students who have differing experiences and perspectives from our own. In our presentation we will discuss what we learned through our experience attending the Symposium and how it has impacted our thinking about leadership and our personal leadership development.

The New Normal: Social Media's Role in Civic Engagement - (Psychology)

By: Tiffany Becker
Faculty mentor(s): Mark Ferguson
Moderator: Debbie Palmer

Many people view young adults' lack of physical and observable civic engagement as a lack of involvement in civic activity. However, this is not the case, as young adults today are changing the venue in which they are politically active. This study's objective was to examine how useful social media activities are in predicting political intentions and behavior. A sample of 130 participants completed measures about the usefulness of Facebook in finding information, how often they used Facebook, what news apps appear in their news feed, and the Theory of Planned Behavior (TPB). Results showed that participants regard Facebook as an acceptable place to find information. Many indicated that they check Facebook several times a day. Participants also reported that U.S. news apps appear the most frequently in their news feeds as compared to sports and lifestyle apps. Analysis of TPB showed that participants' intentions to engage in civic behavior were motivated by perceived control, attitudes about politics, and social norms. Participation intentions were related to actual behavior. Social media sites such as Facebook provide many opportunities for young adults to gather, comment on, and share political information, and therefore provide an access point for engagement.

Group 8
4:00-4:50 p.m. Room A110

Investigation of HLA Genetic Markers Associated with Gluten Sensitivity - (Biology)

By: Matthew Phillips, Michael Maki
Faculty mentor(s): Diane Caporale
Moderator: Diane Caporale

Non-Celiac Gluten Sensitivity (NCGS) is a gastrointestinal disease occurring in 3-6% of the population, while celiac disease (CD) and wheat allergy (WA) are only found in 2-4%. This indicates that 17 million Americans may have NCGS. Only by eliminating a diagnosis of CD and WA through medical testing and the elimination of foods from their diet can a patient be diagnosed with NCGS. Some reports have shown that proteins embedded in the membranes of leukocytes known as human leukocyte antigens (HLAs) are linked to comparable gastric diseases like CD and WA. It is possible that certain HLA genotypes may also be associated with NCGS. To test this hypothesis, we screened a cohort of 50 NCGS and 50 non-NCGS participants for their HLA DQ alpha and beta genotypes, using AllSet+ Gold DQ alpha 1 and beta 1 high resolution allele-specific PCR kits. DNA fingerprints were generated by electrophoresing the PCR products on large agarose gels and photodocumented for interpretation. Unimatch Plus SSP was performed to determine the p value or significance of whether certain HLA DQ genotypes are associated with NCGS. If a particular genotype or variant correlates with NCGS, then this could be used as a more efficient diagnosis tool.

KIAA0319 Gene Association with Dyslexia - (Biology)

By: Liam Hicks, Samantha Wilson
Faculty mentor(s): Diane Caporale
Moderator: Diane Caporale

Dyslexia is a genetic disease where an individual has difficulties decoding texts. Today dyslexia is referred to as a learning disability with no cure, and very limited knowledge of the underlying genetics of the disease. Dyslexia is a complex genetic disorder involving multiple genes. One gene, the KIAA00319 gene, is the most associated with the disease. It has been found that there is a GT repeat within the 5' untranslated region before the coding portion of the gene. This section of the DNA plays a role in regulating the gene. It is hypothesized that the length of GT repeat may hinder either transcription or posttranscriptional modification of the KIAA0319 gene leading to dyslexia. DNA was isolated from the saliva of volunteers with and without dyslexia. The section of the KIAA0319 gene containing the GT repeat was amplified using PCR (polymerase chain reaction). PCR products were run on a gel for conformation, and lastly sequenced in the forward and reverse directions for verification. The presence and abundance of each variant (allele)was identified based on the number of GT repeats recorded for each individual. Here we report the significance of the allele distribution between the dyslexic and wildtype cohorts.

Group 9
4:00-4:50 p.m. Room A111

Measuring Space Use in Captive Animals: Results from the Vivarium Behavior Project - (Biology)

By: Laura Reed-Warrichaiet
Faculty mentor(s): Peter Zani
Moderator: Peter Zani

Species with similar ecological characteristics can affect one another's behavior both positively and negatively. Starting in September 2013 we (the Herpetology Society of Stevens Point) began to observe some of these effects by using the Vivarium display case in the Trainer Natural Resources building. The species of focus included a Painted Turtle, an Ornate Box Turtle, and a Green Iguana, which are permanent residents in the living space of the Vivarium. Members of the Herpetology Society as well as other visitors aided in the data collecting by filling out a chart located outside of the display that included date, time, location of individual animals, and behavior such as basking, feeding, aggression, and movements. The data at the end of the school year (April 2014) revealed that our three study species had altered their generalized home range in response to the addition and/or removal of other species such as a Red-Eared Slider and a Florida Box Turtle. These results reveal that spatial patterns of behavior can be affected by the species present/absent in this mixed-species enclosure. This project is still continuing today with the growing live collection of the Herpetology Society of Stevens Point.

Past Environments of the Dinosaur-Bearing Fort Crittenden Formation in Southeast Arizona - (Geography and Geology)

By: Bryan Hoff
Faculty mentor(s): Samantha Kaplan
Moderator: David Tamres

Researchers at the Arizona Museum of Natural History (AZMNH) collected 11 late Cretaceous sedimentary rock samples from the Fort Crittenden Formation in southeastern Arizona. The samples are from layers that contain dinosaur and other vertebrate remains. UWSP was asked by the AZMNH to analyze the samples for fossil pollen and other microfossils to interpret past environments. Despite ample macrofossil material, little is known of the flora or the micropaleontology of the formation. To better understand the environments in which these dinosaur remains accumulated, we are using chemical techniques to disaggregate the rock and isolate pollen and other microfossils. This opportunity at UWSP is a unique one that few graduate programs offer. Palynology was long used by oil industries as a paleoenvironmental indicator before chemical analysis was a viable option. The oil industry had such an influence that all of the methods used today are named after the companies that developed them. Today, however, palynology is rarely taught in geoscience curriculums. Nevertheless, there is still applicability of palynology for past environmental reconstruction, such as paleobotany and evolutionary biology. In our findings from this study there is a high degree of sediment oxidation with several possible pollen and non-pollen microfossils that may be useful as

paleoenvironmental indicators. This is a great example of how going back to the basics can still solve today's problems.

Group 10
4:00-4:50 p.m. Room A112

STEM: Student Outreach for CNMT Department - (Computing and New Media Technologies)

By: Elise Zingsheim, Kierstan Leaf
Faculty mentor(s): Tim Krause
Moderator: Tim Krause

Student outreach has a large impact on informing high school students about diversity in the STEM field; more specifically the diversity in the field of computer science. This semester we visited five local schools to spark an interest in computer science at the University of Wisconsin-Stevens Point. At each school we presented two Harry Potter style sorting hat applications. The first application was written in Python and runs on a Raspberry Pi. (The code was modified from an example on the Raspberry Pi website: www.raspberrypi.org). The Raspberry Pi, Python, and the Pibrella can provide a cost-effective way for students to learn programming in a beginners' environment. The other application was created using HTML and JavaScript and runs in a web browser. Throughout the presentation, we would ask students about their knowledge of code and their future interest in the area of study. Depending on the time allotted, we displayed some of our class projects to show the variety of class offerings and opportunities that are available at UWSP. At the end of the presentation, we left a copy of the HTML and JavaScript Harry Potter style sorting hat application so that the students could modify the code and explore it further. During this presentation we will discuss our process and results, as well as a list of positives and negatives, or dos and don'ts, for others who are interested in improving their department's student outreach.

Users Are Not Stupid: People Adapt to Imperfect Computer Interfaces - (Computing and New Media Technologies)

By: Brian Hall
Faculty mentor(s): Tim Krause, Justin Rueb, Tomi Heimonen
Moderator: Tim Krause

People work with computers every day, and in every case one thing is constant: computer applications are not designed perfectly. Devices can be unresponsive and slow, and working with equipment that does not work as well as one might like can be frustrating. However, when people have work to do, can they make the best of a bad application? This presentation will report the findings of a double-blind, controlled, counter-balanced experiment of 61 human participants, which examined the effect of slow computer responses (system delay) of a human-computer interface on user experience. The results of the experiment showed that users adapt to delay, making no more errors in high delay conditions (2 seconds per click) compared to low delay conditions (half-second per click). The project was a multi-disciplinary effort between the Psychology and Computing and New Media Technologies departments, conducted over a one-year period. The paper written about this experiment was accepted into the Microsoft ACM

Student Research Competition at the CHI 2016 conference, and will be presented there in May. This talk is a chance to learn about this project and experimental results before they are published in the ACM Digital Library.

Group 11
4:00-4:50 p.m. Room A201

What's the B in LGBT? The Effects of Bisexual Erasure through Passing - (English)

By: Megan Flick
Faculty mentor(s): Dejan Kuzmanovic
Moderator: Dejan Kuzmanovic

Among the many identities in the LGBT+ spectrum, bisexuality is one that is commonly erased through heteronormativity. The idea that there is a distinct difference between "us" and "them," or Heterosexuals and Homosexuals, is distorted by the existence of Bisexuals, Pansexuals, and those who do not conform to the gender binary, such as Shiri Eisner, a genderqueer bisexual and author of Bi: Notes for a Bisexual Revolution. Bisexuals face consequences in both the heterosexual and homosexual communities alike; communities grant passing bisexuals certain privileges, such as access to privileged spaces, but bring about certain oppressions from the "opposing" community as well. Bisexuals also face a number of stereotypes, such as a supposed inability to remain faithful in relationships due to being attracted to more than one single gender identity. The aim in discussing these issues is to end the erasure and stigmatization of bisexuals in the straight and LGBT+ communities.

Hmong-American Literature: Discovering Identity Through Written Texts - (English)

By: Ta Xiong
Faculty mentor(s): M. Wade Mahon
Moderator: M. Wade Mahon

The most recent census of 2010 reports over 260,000 Hmong individuals in the United States, yet there is a disproportionately small amount of literature written by or about Hmong people. The culture of the Hmong people is rapidly being lost as children assimilate into American culture, and this is partly due to its oral tradition. As a result of the trauma of escaping genocide, many Hmong elders are reluctant to share their experiences. Without the knowledge of their elders, Hmong youth struggle to understand the dual cultures they belong to as first-generation immigrants. This project aims to seek a connection between literature as a means of preserving culture, restoring pride, and validating cultural experiences. This oral presentation will explore books available by or about the Hmong and critique the challenges faced in accessing literary texts. It will recount the discoveries of students who have read Hmong books and project core elements these students desire to see in future literary representations of themselves and their culture.

Group 12
4:00-4:50 p.m. Room A202

Grimes and Gines As Animalistic Agents of Social Authority and Structure in Caleb Williams - (English)

By: Paul Grosskopf
Faculty mentor(s): Robert Sirabian
Moderator: Robert Sirabian

In his introduction to *Caleb Williams* (1794), Maurice Hindle equates William Godwin's political philosophy to the revolutionary ideology of Sir Thomas Paine, who considered government "even at its best state but a necessary evil" and which Godwin himself described as nothing more than "regulated force" that acts as a "brute engine which has been the only perennial cause of the vices of mankind." Godwin's view of government as a corrupt and brutish mechanism directly translates to his characterization of the two main figures of social authority in the novel, Mr. Tyrrel and Mr. Falkland. While each of these men attempt to establish social order through hierarchical governing frameworks, they each rely on the animalistic middlemen Gines and Grimes to enforce their position and influence. As a result, these systems are built on the unstable savagery of these men and their instinctual pursuit of power, instead of a greater social stability based on reason and justice. Through this mutual dependence between master and servant, the animalistic qualities of Grimes and Gines reflect those of Tyrrel and Falkland and the source of their corruption and tyranny. By embracing a system of government that demands internalizing social authority within the individual, Godwin asserts that the rule of law which is meant to govern society fairly is instead subordinated to the human appetite for power that these men share, ultimately becoming an unstable vehicle for oppression and injustice.

The Art of Rhetoric As Used in Caleb Williams - (English)

By: Jenna Koslowski, Anna Welton
Faculty mentor(s): Robert Sirabian
Moderator: Robert Sirabian

Since the days of Aristotle, the art of rhetoric has been central to the idea of creating an effective argument. In William Godwin's political, Gothic novel *Caleb Williams* (1794), readers are presented with a multitude of arguments which are best understood when accompanied with the knowledge of rhetorical theory. Caleb Williams uses the Aristotelian proofs to emphasize the power dynamics within the rhetoric of the characters. Mr. Falkland, Caleb Williams, and Captain Raymond do this by using ethos, logos and pathos in front of their peers to form key forensic style arguments in the novel. These are used to prove if an act is just or unjust and is often used in the courtroom to decide the defendant's fate. The theoretical background of the thesis is explained through Aristotle's proofs and a study. Falkland demonstrates an effective use of rhetoric through his use of ethos and logos based on his social standing. In contrast, Caleb fails in his attempt to use logos and pathos to sway his audience because of his word choices. Captain Raymond, leader of gang of thieves, relies on ethos and pathos in his argument, established by his character and leadership. The arguments the characters make are influenced by the power they do or do not have.

Group 13
4:00-4:50 p.m. Room A207

A Sociological Study of the Deep Web - (Sociology and Social Work)
By: Kyle Ebelt
Faculty mentor(s): David Barry
Moderator: Krishna Roka

The Deep Web is a vital aspect of understanding the Internet and the global society that we live in. The Deep Web "community" functions like any other social group in today's society. Many of the same factors and psychology can be applied to the users of the Deep Web. The Deep Web is any part of the Internet that cannot be indexed by a search engine, such as Google, Yahoo, or Bing. This section of the Internet can be better understood using key ideas from the social sciences. Specifically, this study examines the sociological determinants of the users of this area of the Internet. To do so, the social determinants of the Deep Web will be analyzed through case studies and the results of survey data that emphasizes socio-economic factors. This study also will focus on the aspects of the Deep Web that users are attracted to, such as the anonymity, the amount of information, or the privacy from worldwide governments.

Poster Presentations 3:10-4:00 p.m.

Science Building (A-wing corridors)

A Rise in Coinfection Risk of Tick-borne Diseases in Schmeeckle Reserve - (Biology)
By: Celia Hein, Ariel Marcoe
Faculty mentor(s): Diane Caporale

The blacklegged tick (Ixodes scapularis) harbors three major pathogens: Borrelia burgdorferi, Anaplasma phagocytophilum, and Babesia microti, which cause Lyme disease, Human Granulocytic Anaplasmosis (HGA), and Babesiosis, respectively. The prevalence of tick-borne diseases in the United States has been increasing over the last two decades. For all three of these diseases, the majority of reported cases are localized in the Northeast and Upper Midwest. In 2014, there were 25,000 reported cases of Lyme disease nationwide, whereas in Wisconsin, there were 1,000 reported cases of Lyme disease, 477 cases of HGA, along with 30 cases of Babesiosis. Reports of human infection have thought to be underrepresented due to lack of co-infection testing. Since year 2000, UWSP students have tested and identified the prevalence of these pathogens and coinfection in blacklegged ticks collected along the perimeter of Lake Joanis in Schmeeckle Reserve, to assess the risk of contracting tick-borne diseases. Through data analysis from 2000-2015 a general trend of increasing pathogen prevalence around Lake Joanis was observed and, more importantly, from 2014-2015 we observed a dramatic spike in infection rates for B. burgdorferi (30% - 50%) and A. phagocytophilum (9% - 46%). Since its appearance in 2007, prevalence of B. microti has quickly increased to 13% in 2015. This study begins to identify potential factors influencing tick infection rates and predict future risks to human health.

Alternatives to Alcohols for Use As Long-Term Preservatives in Fluid Vertebrate Collections - (Biology)

By: Noah Daun, Loren Fahlstrom
Faculty mentor(s): Justin Sipiorski

There are about 20,000 lots of fishes stored in the Becker Memorial Ichthyological Collection (BMIC) of the UWSP COLS Museum of Natural History. Specimens in these lots are originally fixed in a solution containing formaldehyde. After immersion in fixative for several days the specimens were transferred into dilutions of isopropanol and ethanol for long-term preservation. Fish lots in alcohols were stored in high-quality glass jars with lids lined with polymers to prevent evaporation. In an effort to comply with changing fire codes, recently the BMIC curatorial staff has been asked transfer specimens from flammable alcohols into solutions of less flammable alternative preservatives. As part of this process, BMIC staff are testing exposure of formerly formaldehyde-fixed, alcohol-preserved fish carcasses to multiple concentrations of three commercially available alternative preservatives: Formalternate (Flinn Scientific), Nascogaurd (Nasco) and Carosafe (Carolina Biological). In January 2016, similarly sized fathead minnow carcasses were weighed and measured and placed in jars of four concentrations of the three preservatives — 100%, 75%, 50% or 25% (the company-specified concentration =100%). Half the carcasses were fully immersed in preservative with no head space in the jar and the other half were exposed to aerial head space. The carcasses will be monitored indefinitely for any signs of degradation — disintegration, loss of weight, shrinkage, or discoloration.

Assessment of the Biodiversity of Freshwater Mussels in Minnesota, Wisconsin, and the Upper Peninsula of Michigan - (Biology)

By: Mary Gertner
Faculty mentor(s): Daniel Graf

Previous projects have gathered specimen records into an integrated database of mussel species to show verifiable records connected to locality data. This database has since gained many more records to reveal a broader range in which to analyze mussel species richness throughout the upper Midwest (Mississippi, Great Lakes, and Hudson Bay drainages). The database consists of 17,979 analyzed records, with 2,847 from Minnesota, 14,450 from Wisconsin, and 682 from the Upper Peninsula of Michigan. These records were compiled from eight major museum collections as well as species observations reported by the Wisconsin DNR. Each mussel record has been georeferenced to its specific township and county and placed in the drainage hierarchy, which makes it possible to produce maps using subsets of records. The maps generated from these analyses have been used to determine species richness of the region by county. Species richness is highest in counties along the Mississippi River and its major tributaries, with a secondary hotspot in the Fox River basin. These data will also be used to evaluate patterns of distributions, leading to the ability to correct misidentifications and data errors within these mussel collections. We can also use the data to generate hypotheses on the various species associated with the river basins of the upper Midwest, as well as determine species diversity among the basins, and perhaps also test hypotheses regarding post-glacial patterns of mussel species in the region.

Black Spot Parasitism of Luxilus cornutus (Cyprinidae: Actinopterygii) in Wisconsin: A Statewide, 65-year Perspective - (Biology)

By: Andrew Zabel, Erik Halverson, Richard Mahoney, Johnathon Butkus
Faculty mentor(s): Justin Sipiorski, Todd Huspeni

We are currently constructing a dataset comprising all specimens of the Becker Memorial Ichthyology Collection (University of Wisconsin- Stevens Point Museum of Natural History) for the Common Shiner (Luxilus cornutus). Specimens have been collected from throughout the state of Wisconsin over the past 60 years. Our accessioning and cataloging is ongoing, and to date we have currently gathered data from over 10,000 specimens. This represents approximately 30% of the total individuals in this collection. For each specimen cataloged, we recorded total length (mm), preserved mass (g), gonad mass (g) and estimated age. We also recorded the number of individual Black Spot parasites (metacercariae of Uvilifer ambloplites) on the left side of each specimen. Considering size classes of fish over 30 mm and sample sizes of at least 30 fish, prevalence (% individuals with at least one parasite) varied across populations from 100% to 25%. Considering similar size classes and sample sizes, average intensities (average number of parasites on the left side of infested individuals) varied from 0 to 213. Separate analyses were conducted for each sex for individuals ranging from 30 – 80 mm (ages I & II; Becker 1983). Multiple regression analyses will be calculated to evaluate the relationships among parasite intensity, sex, location, season, latitude, and total length. The results of these are reported here.

Can a Mutated Breast Cancer Gene Be Associated With Small Cell Lung Cancer? - (Biology)

By: Mary Workman, Chelsea Reierson
Faculty mentor(s): Diane Caporale

Mutations in the BRCA2 gene have been linked to increased risk of breast cancer in previous studies. A patient with a previous Breast Cancer diagnosis and a confirmed BRCA2 mutation has recently been diagnosed with Small Cell Lung Cancer (SCLC). This study is examining a potential connection between a mutated BRCA2 gene and increased risk of SCLC. DNA was isolated from the biopsy of an SCLC tumor from this patient. The BRCA2 gene sequence was amplified through PCR using primers flanking the exons of the gene. The PCR products were then sequenced, the resulting sequence compared to the wild type BRCA2 sequence, and screened for mutations, keeping in mind the patient's previous mutation. Results of this study indicate whether the BRCA2 gene shows an additional mutation that could contribute to SCLC. Discovery of a mutation in BRCA2 could suggest a genetic predisposition for increased risk of SCLC. Further studies to verify and duplicate these results with a larger sample size of DNA from patients diagnosed with both Breast Cancer and SCLC could lead to early risk screening, diagnosis, and treatment for Small Cell Lung Cancer patients.

CCL2 Protein Determination in a Transgenic Mouse Model - (Biology)

By: Mary Stone, Rachel Smith
Faculty mentor(s): Jennifer Bray

Alcohol consumption has proven to have a large impact on the brain and its neurologic functions. Previous research has shown that after alcohol administration a neuroinflammatory factor called CCL2 is elevated in the brains of both humans and mice. Current studies suggest that this response serves a beneficial function to protect neurons from damage and impairments in memory after alcohol consumption. To accurately measure the amount of CCL2 protein in the hippocampus, a brain region involved in learning and memory that is impaired following alcohol administration, two biochemical techniques were utilized in the laboratory: the Lowry protein assay and the enzyme-linked immunosorbent assay (ELISA). By using genetically engineered mice that overexpress CCL2, we can compare two regions of the brain, the hippocampus and cerebellum (involved in motor learning), and compare the levels of CCL2 protein to non-transgenic mice that do not have this modification. By using the Lowry protein assay, we can determine the total protein concentration in our hippocampal and cerebellar samples. After determination of the total protein concentration, ELISA was used to quantify the amount of the CCL2 protein in our samples. With this information, further studies will allow us to look at CCL2 levels in both the transgenic and non-transgenic mice after the consumption of alcohol and determine the effects CCL2 protein has on memory and learning as well as synaptic transmission in the hippocampus.

Characterizing Ornamental Crabapple Progenies for Plant Habit and Leaf Size, Color, and Lobing - (Biology)

By: Caitlyn Fleischman, Susan Brown
Faculty mentor(s): Brian Barringer

Weeping tree habit, leaf color and leaflobing are valued ornamental traits in Malus. However, weeping is the least studied growth habit in apple and leaflobing also has not been researched extensively. A better understanding of both these traits would be useful in breeding new crabapples for landscaping. In this study, one-year-old plants from four different progenies were characterized for these traits. These progenies helped confirm the dominant gene for weeping, the dominant gene for red coloration of foliage and indicated greater variability for leaf size outside of the parental means. Leaflobing was inherited and expressed much more strongly than in previous studies on this trait with differentgermplasm. These results demonstrate the potential for creating new crabapples with weeping habit, attractive red/purple leaf types and deeply lobed leaves.

China, Family Planning, Ecology, and Religion: How Do the Current Religious Dynamics in China Reflect Contraceptive Use in the Timeframe of China's One-Child Family Policy? - (Biology)

By: India Hawkins
Faculty mentor(s): Brian Barringer

Religion is an important topic in modern society and has contributed to a significant amount of sociological and political change throughout history. For many people, religion provides a moral and ethical framework around which they build their lives and upon which many of their personal decisions are made. At the same time, today's society is increasingly focused on a number of important environmental issues, many of which are likely to become even more important in the coming years. Certainly one of the most fundamental issues is that of human population growth and the increasing pressures it places on global resources. How often are these important ecological issues discussed in a religious framework? In what ways does religion influence personal, national, or global policies related to important environmental issues? This research addresses the question of how ecological and religious values converge to create, enact, and influence policies that are intended to mitigate the ecological crises of today. As a case study we focus specifically on China's family planning policy in terms of how and why it arose, its goals, and whether it was successful in meeting its goals. To address these questions we explore and summarize recent literature on population control, focusing specifically on China's family planning policy, the ecological context in which it was enacted, and its relationships with the religious dynamics of China.

Contributing Factors to Canker Sores Among College Students - (Biology)

By: Emma Brukner, Emma Ray
Faculty mentor(s): Aaron Davis

Canker sores are painful ulcers that frequently occur on the cheek and gums of the mouth. These mouth ulcers typically heal within two weeks of occurring, and can be triggered by multiple factors. The cause of canker sores is currently unknown, and their trigger varies from person to person. In order to better understand the etiology of canker sores we surveyed 850 students at the University of Wisconsin-Stevens Point in order to determine the frequency of students who suffer from canker sores, as well as the conditions that contribute to triggering them. We found that 40% of students get canker sores on a regular basis. Furthermore we found that a majority of students cannot identify a specific trigger for the occurrence of canker sores. Because so many students frequently suffer from canker sores without a known cause or a proven treatment, these findings will help in the prevention of canker sores by educating individuals about their individual trigger. We additionally collected saliva samples for further analysis for contributing factors of canker sores.

Effects of Arousal on Energetics of Overwintering Lizards - (Biology)

By: Chun Huai Luo
Faculty mentor(s): Peter Zani

In many animals, winter arousal behavior is greatly influenced by energetic status because being able to arouse in winter is energetically costly. Although an animal can store energy in multiple forms, previous research indicates that glycogen is the primary source of energy for overwintering ectotherms. Considering that winter arousal requires a large amount of energy, lizards aroused in winter are expected to convert some of the glycogen stored in liver to a usable form of energy (glucose) in order to be active. Thus, we hypothesized that lizards aroused from their winter environment would have lower glycogen content in the liver than hibernating lizards. In order to test this hypothesis, a winter condition was imposed on 20 side-blotched lizards for 30 days. Ten lizards were allowed to warm and be active for two days and were sacrificed during this arousal while 10 additional hibernating lizards were sacrificed without being aroused to collect and assay their liver tissues. Liver glycogen content was determined by colorimetric analysis. Contrary to our hypothesis, the results indicate that the aroused (active) group had higher liver glycogen content than the non-aroused (hibernating) group. This suggests that two days of arousal is sufficient for replenishment of liver glycogen, which leads to the next step of this experiment being to determine the source of energy for liver glycogen replenishment.

Effects of Buckthorn on Native Flora in Schmeeckle Reserve - (Biology)

By: Lauren Nichols
Faculty mentor(s): Brian Barringer

Buckthorn (Rhamnus spp.; Rhamnaceae; hereafter, buckthorn) is an invasive woody plant that dominates many natural plant communities in the United States and Canada. Attributes such as allelopathy, absence of natural competitors, and adaptation to a wide-array of habitats facilitates buckthorn's success, creating resource competition with and impacting the survival of native species. In this study, 126 circular (10m radius) study plots in Schmeeckle Reserve were surveyed for native understory plants, including buckthorn, and divided into five different habitat types based on a number of environmental characteristics. Species diversity (Simpson's index) values were determined for each study plot and analyses were conducted to determine whether the presence or abundance of buckthorn affects the presence or abundance of native plants. Overall, our results suggest that buckthorn may have an effect on native understory plant species diversity and that the magnitude of the effect varies among habitat types.

Effects of Lateral Coloration on Female Mate Choice in Side-Blotched Lizards - (Biology)

By: Logan Zimmerman, Haley Dexter, Stephen McKee, Jessica Corning, Shantaya Schmidt
Faculty mentor(s): Peter Zani

Many lizards have color morphs that affect sexual preference. This polymorphism

appears in male side-blotched lizards as differing lateral coloration in some populations. We studied a population with two male lateral color morphs: orange and yellow. We predicted that color affects mate preference by females. In a lab environment, we gave field fresh females a choice of two males that differed only in color. We quantified the choice the gravid female made by the male she approached. Our results should allow us to determine if the female has a preference for one lateral color over another.

Effects of Monochromatic LED Lighting on Growth of Yellow Perch (Perca flavescens) - (Biology)

By: Richard Mahoney, Johnathon Butkus
Faculty mentor(s): Christopher Hartleb

Many different factors contribute to growth and survival when raising yellow perch. Handling, netting, and disturbance can startle the fish; this halts feeding and suspends growth. By using in-tank lighting the startle response by fish can be reduced. LED lighting, that uses a monochromatic spectrum, is gaining popularity due to low running cost, high light output and longevity. This study compared the growth of yellow perch raised under five different spectrums of monochromatic LED lights installed in-tank with two different background colors. Yellow perch were raised in recirculating aquaculture systems consisting of twenty, 38-gallon round Fiberglas tanks. Ten fish were in each tank with four replicate tanks for each color light: blue, green, red, yellow and white. Previously, we examined lighting effects on perch with blue background tanks; more recently we used a white background. Yellow perch were fed 3% BW/D using auto feeders that delivered food 6 times per day. Temperature was held constant at 22^{0}C using an inline heater. Growth, length and wet weight, were recorded every two weeks. Results showed that blue LED light resulted in the best growth by perch when the tank background was also blue. Green LED light resulted in the best growth by perch when the tank background color was white. We speculate that tank background color may influence food contrast for the yellow perch and specific color combinations enhance visual acuity thereby making food detection easier.

Exercise Physiology of Yellow Perch (Perca flavescens) - (Biology)

By: Joshua Keller, James Miazga
Faculty mentor(s): Christopher Hartleb

In aquaculture, most traditional fish hatchery settings use a random velocity of flowing water in fish rearing tanks. Recently, studies have shown that salmonids grow optimally at moderate to high flow and will put on less fat and more muscle. More muscle is ideal, as that is what is sold on the market. Exercise is a mechanism that can be used to reduce overall fat levels and produce more muscle growth. Most aquaculture facilities house their fish in in static tanks. Producing an artificial current within an aquaculture system forces the fish to adapt to the current; making them swim (exercise). Exercise increases swimming efficiency of fish and may help with energy expenditure and the cost of growth within the available metabolic range. In this study, we induced exercise using a range of different water velocity treatments in the culture of yellow perch by using an "inverted L" water inflow apparatus to create current. Treatments consisted of no current and four increasing velocities. All fish were measured biweekly to track growth

throughout the experiment. Water velocity and quality were measured weekly, with food provided continuously to meet the high energy demand of constantly swimming. Previous results from a 120-day experiment that had velocities up to 12-14 cm/s showed that velocity may be too fast at 8-10 cm/s. This study narrowed the velocities to more specific ranges under 10 cm/s in an attempt to identify the threshold water velocity.

Experimental Test of Overwinter Site Selection by Ectotherms Based on Thermal and Spatial Cues: Side-Blotched Lizards Prefer Smaller Crevices Over Warmer Sites - (Biology)

By: Alex Thomas
Faculty mentor(s): Peter Zani

Winter site selection by ectotherms is often complex and the factors influencing this process are not yet fully understood. In many reptilian species microhabitat temperature appears to influence overwintering site selection, but the importance of spatial cues cannot be ruled out. To clarify the role of thermal and spatial cues, we independently tested how temperature and crevice size affects overwintering site selection of side-blotched lizards in the lab. Winter-acclimated lizards were allowed crevice selection in an artificial hibernaculum (winter habitat) in which heat and space were altered separately. This allowed us to test gradients of heat (~5–15 °C), or space (6, 13, or 19 mm-tall crevices), or both. Experiments were preformed i) with a heat gradient, but without a space gradient, ii) without a heat gradient, but with a space gradient, and iii) with both heat and space gradients. The results of this experiment show that thermal or spatial cues by themselves may influence site selection, but when both heat and space gradients are available, lizards prefer smaller crevices over warmer sites. These results indicate that for overwintering ectotherms, crevice size may be more influential than temperature for site selection.

Exploring Aquaponics: Comparing Fish Production to Plant Growth and Nutrient Removal - (Biology)

By: Taylor Remington, Kayla Fuller, Colton Branville
Faculty mentor(s): Christopher Hartleb

Aquaponic systems are recycled aquaculture systems consisting of hydroponic plants utilizing the nitrogen cycle. In aquaponics, water circulates between vegetables and fish tanks. Suspended and dissolved wastes are converted to plant nutrients using mineralization and nitrifying bacteria. So far, tilapia have been the only fish studied extensively in aquaponics, so this project examined walleye. We studied replicate walleye and tilapia systems to compare water chemistry, four plant types (kale, romaine lettuce, pac choi and broccoli) and fish growth. The water chemistry parameters measured were nitrogen, phosphate, sulfate, iron, copper, nickel, potassium, molybdenum, alkalinity, hardness, and pH. The walleye were fed a carnivorous diet with a high protein level (43%) derived from animal meal, and the tilapia were fed an omnivorous diet with a lower protein level (23%) derived from a mixture of animal/plant meal. Tilapia and walleye both grew well in the aquaponic systems with only culture duration being different. We also found no major differences in plant growth for any of the four plant types. Water chemistry factors nitrogen, phosphorus, and potassium

showed significantly greater abundance in the tilapia systems with all other water chemistry factors similar. Since modern aquaponics is a fairly new field of agricultural technology, there is still much to learn about the efficiency of different fish and plant species and how maximizing production can be accomplished.

Female Side-Blotched Lizard Mate Choice Based On Size - (Biology)

By: Nicholas Mastrocola, Courtney Kaleel, Frances Torres, Kaylee Roberts, Raz Sitthideth
Faculty mentor(s): Pete Zani

Body size in lizards is directly related to their age and experience. Based on sexual-sized dimorphism theory the bigger the male the more attractive the male lizard will be to the female. Therefore, we are looking at size preference in female side-blotched lizards for male lizards. Female lizards should prefer larger lizards over smaller ones due to age and experience. The experiments consisted of placing one female in an enclosure with two males placed in two, separate, smaller cages. A barrier was placed between the two males' cages. Mate choice was determined by the female approaching the male on either side. Our results should allow us to determine that there is mate choice among females based on body size of males.

Historical Patterning of Age, Growth, Body Condition and Ectoparasite Loads in Wisconsin Populations of the Bluntnose Minnow (Pimephales notatus) - (Biology)

By: Loren Fahlstrom, Ellie Wallace, Christopher Rosenthal, Andrew Teal
Faculty mentor(s): Justin Sipiorski

We are gathering life history information for Wisconsin populations of the Bluntnose Minnow (Pimephales notatus) from all holdings in the Becker Memorial Ichthyological Collection (BMIC) of the UWSP COLS Museum of Natural History. This work is currently in progress but will eventually encompass the collection of data from thousands of individuals collected from throughout the state over the past century. The Bluntnose Minnow is one of the most ubiquitous fish species in Wisconsin. We are measuring total length (mm), body weight (g) and gonad weight (g) from all BMIC holdings. We are estimating the age of individuals by counting scale annuli and we are quantifying infestations of the "Blackspot" fluke, an ectoparasite. We will conduct length weight regressions and length-at-age analyses for historical Wisconsin populations. We hope to compare these past life history parameter values to those of present day populations. We also hope to compare past and present life history data with statewide landuse patterns, pollution patterns, climatological information and other socioeconomic patterns in a GIS framework.

Historical Patterning of Growth, Body Condition and Ectoparasite Loads in Wisconsin Populations of the Central Mudminnow (Umbra limi) - (Biology)

By: Adam Garlie, Joseph Dax, Zachary Mohr
Faculty mentor(s): Justin Sipiorski

The Central Mudminnow (Umbra limi) is widespread species of fish found in Wisconsin. Life history data are being collected from all holdings of mudminnows in the Becker Memorial Ichthyological Collection (BMIC) of the UWSP COLS Museum of Natural History. Collections are close to complete from hundreds of collections made from throughout the state over the past 60 years. From mudminnow specimens, BMIC staff collected total length (mm), body weight (g) and gonad weight (g). Also quantifications of infestations of the "Blackspot" fluke, an ectoparasite, were made by counting their occurrence on the left side each specimen. Length-weight regressions and spawning phenology analyses for historical Wisconsin mudminnow populations will be conducted. These past life history parameter values will be compared to those of present-day populations. Past and present life history data will also be compared with statewide landuse patterns, pollution patterns, climatological information and other socioeconomic patterns in a GIS framework.

Identifying Spatial and Temporal Patterns of Anthropogenic Nitrogen Deposition and the Influence on Aquatic Community Change in Wisconsin Lakes - (Biology)

By: Markie Rodgers, Caitlin Shaw, Natalie Lirette
Faculty mentor(s): Krista slemmons

The health of aquatic primary producers, on which all species depend, is vital to the function and services provided by freshwater. Over time, increased nutrients elicit stark changes in primary producers, particularly diatom communities, and can indicate that these aquatic systems have researched an ecological threshold. This is apparent in regions where elevated levels of nitrogen are associated with ecological shifts.We examined sediment cores from Wisconsin Lakes along a nitrogen gradient to identify temporal shifts in diatom communities. We conducted nitrogen isotopic analysis to determine ifdN signatures were correlated with diatom community change. We present our preliminary findings from Crampton and Pike Lakes. These results have direct implications to the wise management of the water resources on which we depend and can lend suggestions to the establishment of critical nitrogen thresholds to diminish ecological change as a result of pollutants.

Inventory of Bryophytes of St. Martin's Island, Michigan - (Biology)

By: Tana Route
Faculty mentor(s): Virginia Freire

St. Martin Island is located in Lake Michigan off the Garden Peninsula in Delta County. It is the southernmost island in Michigan that is part of the archipelago at the mouth of Green Bay. The island is unoccupied and 94% of it was privately owned and unmanaged.

It was recently sold to The Nature Conservancy and then donated to the Green Bay National Wildlife Refuge. Due to the lack of studies of flora and fauna, a selected group of Michigan and Wisconsin biologists were invited to survey it. Biological surveys are necessary to determine effective management guidelines. Bryophytes of the island were collected in 2013 and 2014. The identification of the specimens continues but so far 73 different species in 53 genera were identified. Of those 56 are mosses and 17 are liverworts. A new report for the area, Pseudoleskeella tectorum (Brid) Kindb ex Broth. was found. We failed to find Sphagnum, a genus reported for neighboring Summer Island. Although our collection was not exhaustive, this is a very conspicuous moss. The type of substrate on St. Martin's, mainly limestone with high pH, may account for this difference. In numbers, this preliminary survey is roughly at 60% of the bryophytes reported for Summer Island.

Investigation of HLA Genetic Markers Associated with Gluten Sensitivity - (Biology)

By: Michael Maki, Matthew Phillips
Faculty mentor(s): Diane Caporale

Non-Celiac Gluten Sensitivity (NCGS) is a gastrointestinal disease occurring in 3-6% of the population, while celiac disease (CD) and wheat allergy (WA) are only found in 2-4%. This indicates that 17 million Americans may have NCGS. Only by eliminating a diagnosis of CD and WA through medical testing and the elimination of foods from their diet can a patient be diagnosed with NCGS. Some reports have shown that proteins embedded in the membranes of leukocytes known as human leukocyte antigens (HLAs) are linked to comparable gastric diseases like CD and WA. It is possible that certain HLA genotypes may also be associated with NCGS. To test this hypothesis, we screened a cohort of 50 NCGS and 50 non-NCGS participants for their HLA DQ alpha and beta genotypes, using AllSet+ Gold DQ alpha 1 and beta 1 high resolution allele-specific PCR kits. DNA fingerprints were generated by electrophoresing the PCR products on large agarose gels and photodocumented for interpretation. Unimatch Plus SSP was performed to determine the p value or significance of whether certain HLA DQ genotypes are associated with NCGS. If a particular genotype or variant correlates with NCGS, then this could be used as a more efficient diagnosis tool.

Isolation of Endophytic Fungi from the Complex Thalloid Liverwort Conocephalum Conicum - (Biology)

By: Breanna Post, John Kavajecz, Arin Lemke
Faculty mentor(s): Terese Barta, Virginia Freire

Endophytic fungi grow within plant hosts and play a critical role in the structure, function, and health of plant communities. Fossil records indicate that plant-fungal associations have a vital role on plant origin, survival and evolution. Endophytic fungi isolated from known medicinal plants have been found to have antimicrobial and antitumor properties commonly attributed to their host vascular plants. Bryophytes, which belong to the oldest lineage of plants, rely on endophytes for food absorption due to their lack of roots. Medicinal properties of some bryophytes have been reported, but there are no studies about the medicinal properties of their endophytic partners. The

purpose of this study was to isolate endophytic fungi from Conocephalum conicum, a complex thalloid liverwort with known antitumor properties. Fresh liverwort thalli were rinsed in distilled water, lightly brushed to remove soil particles, and surface-sterilized with 5% or 10% bleach for time periods between 30 seconds and 2 minutes. Pieces of tissue were aseptically plated on quarter-strength potato dextrose agar. We are presently investigating 11 fungi isolated from C. conicum. Isolates were purified by repeated transfer of mycelium to PDA plates or PDA amended with streptomycin. The fungi are being identified by morphology using a slide culture method, as well as DNA isolation followed by PCR application and sequencing of the interspacial region of the small subunit ribosomal RNA gene.

KIAA0319 Gene Association with Dyslexia - (Biology)

By: Samantha Wilson, Liam Hicks
Faculty mentor(s): Diane Caporale

Dyslexia is a genetic disease where an individual has difficulties decoding texts. Today dyslexia is referred to as a learning disability with no cure, and very limited knowledge of the underlying genetics of the disease. Dyslexia is a complex genetic disorder involving multiple genes. One gene, the KIAA00319 gene, is the most associated with the disease. It has been found that there is a GT repeat within the 5' untranslated region before the coding portion of the gene. This section of the DNA plays a role in regulating the gene. It is hypothesized that the length of GT repeat may hinder either transcription or posttranscriptional modification of the KIAA0319 gene leading to dyslexia. DNA was isolated from the saliva of volunteers with and without dyslexia. The section of the KIAA0319 gene containing the GT repeat was amplified using PCR (polymerase chain reaction). PCR products were run on a gel for conformation, and lastly sequenced in the forward and reverse directions for verification. The presence and abundance of each variant (allele)was identified based on the number of GT repeats recorded for each individual. Here we report the significance of the allele distribution between the dyslexic and wildtype cohorts.

Lake Joanis, Schmeeckle Reserve, Bluegill (Lepomis marcochirus) Population Dynamics Over the Past 25 Years - (Biology)

By: Jacob Rocke
Faculty mentor(s): Justin Sipiorski, Josh Raabe

Lake Joanis is an important ecological and recreational component of Schmeeckle Reserve in Portage County, Wisconsin, but the fish community has not been recently assessed. In October of 2015 I conducted a fish survey using the same six nets and trap locations as a previous survey in the spring and fall of 1993-1994. I conducted more detailed analyses on the most common species, bluegill (Lepomis macrochirus). There were 191 bluegills caught in 2015 compared to 409 bluegills caught in the previous study, with the majority of fish caught in 1993-94 between 90-130mm while the 2015 bluegill were mainly between 60-90mm. However, a proportional size distribution (PSD) index that only uses bluegill above 6 inches found that size structure of bluegill was larger (16) in 2015 than in 1993-1994 (2), indicating proportionally more large fish in the recent survey. In both surveys the bluegill PSD was lower than the range (20-50) of a

balanced bluegill population. A von Bertalanffy equation found that bluegill from 2015 grew faster and larger than those caught in the previous study. A length-weight relationship showed that the 2015 bluegill grow more rotund because the growth parameter was above 3. Overall, less bluegill were caught in 2015, but those bluegill were larger in length and weight and grew faster than those caught in 1993-94. I am conducting another survey in spring of 2016 and my results will be useful in managing the fish community in Lake Joanis.

Mate Preference in Side-Blotched Lizards Based on Population of Origin - (Biology)

By: Mary Lutz, Laura Risser, Cayla Cavey, Nikayla Schimdt, Sara Fischer
Faculty mentor(s): Pete Zani

Side-blotched lizards occupy a wide distribution in the western United States. Normally, these populations are too distant to breed naturally in the wild, leading to reproductive isolation and potential preference for familiarity. We set out to determine if there was mate choice for a local male or a distant male. We studied two different populations to determine if the female had a preference for a male from her home population, or if she was attracted to a male from a different population. To do this, we put two males of differing populations, each in their small own cage, into a larger cage with a female. Males were separated by a barrier, so only the female could interact with both males. The female was allowed to display and approach the male that she preferred. Our results should allow us to determine whether or not there was mate preference for local or distant populations in this species.

Phenotypic and Genetic Analysis of Microbes from an Aquaponic System - (Biology)

By: Brittany Erickson
Faculty mentor(s): Matt Rogge

Water samples were collected from different areas of an aquaponics system and tested for coliforms. An aquaponic system combines aquaculture and hydroponic techniques to produce food in a soil-less environment. A coliform is a gram-negative, non-spore forming, lactose fermenting organism used to identify potentially contaminated water. Following coliform quantification, bacterial isolates were biochemically characterized to better identify the organisms. In addition to coliform quantification, enrichment media was used to enrich for the growth of Salmonella and Shigella, if present. Isolates of interest from these analyses were also biochemically characterized. Based on biochemical analysis, a majority of the bacterial isolates collected were presumptively identified as Citrobacter species. Additional presumptive identifications included Aeromonas, Edwardsiella, Providencia, and Proteus. Select organisms were further analyzed by sequencing the 16S DNA to verify the presumptive identification. Genetic analysis confirmed that a majority of the organisms sampled were in the genus Citrobacter. Organisms from the genera Providencia, Aeromonas, Edwardsiella, and Klebsiella were also identified, but less commonly than Citrobacter. All of the genera identified are commonly associated with aquatic environments. While some of these organisms can be associated with infections in humans, they are rarely associated with foodborne illnesses.

Physiology of Stress in Three Endemic South African Small-Bodied Shysharks (Family Scyliorhinidae: Actinopterygii) - (Biology)

By: Ellie Wallace
Faculty mentor(s): Sarah Jane Alger, Justin Sipiorski

Angling exposes sharks to physical exhaustion and other types of stress. One shark group upon which angling has unknown effects is the shysharks, including the Puffadder Shyshark, Dark Shyshark and Leopard Catshark. Working with the RecFishSA program at the South African Shark Conservancy, I evaluated whole-blood lactate levels in wild-caught shysharks experiencing voluntary stressors like actively foraging, involuntary stressors such as simulated angling by chasing, and the effects of short recovery periods. I quantified several behaviors while the sharks were being subjected to chasing or foraging stimuli, including behaviors indicative of physical exertion (i.e., line changes and tail whips), "psychological" stress (i.e., turning, circling, head raises, and suspensions), and interest (i.e., stimulus approaches). I hypothesized that lactate levels correlate with physical exertion and "psychological" stress. There were no lactate level differences among the species or sexes. Lactate levels were higher in sharks experiencing chasing stimuli compared to foraging stimuli. The two behaviors indicative of physical exertion were positively correlated with lactate levels. None of the behaviors indicative of "psychological" stress or interest significantly correlated with lactate levels. These data suggest that, in shysharks, whole-blood lactate is primarily influenced by increased anaerobic metabolism during physical exertion rather than "psychological" stress.

Pollen Problems: Cloning of Two Male-Sterility Mutants in Soybean - (Biology)

By: Zachary Christensen, Sandi Thu, Wyatt Beyers
Faculty mentor(s): Terese Barta, Devinder Sandhu

Sterility refers to spores and gametes that are abnormal or absent, or individuals that fail to produce functional gametes to produce offspring. Since manual cross-pollination to produce large quantities of hybrid soybean seed is difficult and time consuming, identifying a stable male-sterile system would create a breakthrough in hybrid seed production. Two male-sterile soybean mutants (ms1 and ms3) have been identified and mapped. Objectives of this investigation were to fine map and isolate these two genes controlling male fertility in soybean. Genetic linkage mapping was used to locate ms1 and ms3 genes to chromosomes 13 and 2, respectively. The comparisons of the genetic linkage maps with the sequence based physical maps helped in localizing ms1 to a 76 Kb region containing 12 genes, and ms3 to a 3.7Mb region containing 302 genes. Predicted genes in the corresponding regions were studied for the putative functions and candidate genes were identified for each of the male-sterility genes. We are currently sequencing wild type and mutant alleles to identify causes of mutants. Characterization of the genes involved in male fertility may play a critical role in development of economically feasible soybean hybrids.

Quantifying Ecological Change in Diatom Diversity from Paleolimnological Records in Swedish Lakes - (Biology)

By: Jennifer Schimanski, Daniel Soderlund
Faculty mentor(s): Krista Slemmons

Global concentrations of atmospheric nitrogen have increased dramatically over the last 150 years. While the effects of nutrients, particularly phosphorus, on aquatic systems are well known, the ecological influence of elevated atmospheric nitrogen to lakes over long temporal scales remains unclear. Elevated nitrogen has been attributed to rapids shifts in primary producers, across the globe particularly in high latitude regions. Given the sensitivity of diatoms to environmental change, examination of lake sediments can provide clues as to the conditions of the lake such as nutrient concentrations, temperature, pH lake turbulence and ultraviolet light at a certain period of time.These paleo analyses allow for comparisons to present conditions and offer predictions of lake conditions under future nutrient scenarios. We observed fossil diatoms from Swedish lakes with varying atmospheric nitrogen deposition to determine the effect of augmented nitrogen on lakes.We quantified species diversity and community turnover from four Swedish lakes. Preliminary results indicate major shifts in diatom community structure over time and declines in diatom species richness over the last 150 years. These results may provide insight into the trajectory in which lake communities may proceed under novel environmental conditions and may be applicable to other freshwater ecosystems experiencing nutrient shifts.

Reproductive Histology of Mice Transgenic for Chemokine Ligand 2 (CCL2) - (Biology)

By: Erica Kleist, Cali Hagen, Amarra Zehms
Faculty mentor(s): Karin Bodensteiner

The chemokine ligand 2 (CCL2; also referred to MCP-1) is a small protein which mediates inflammatory processes and may act as a neuroendocrine modulator. Mice transgenic for CCL2 under the control of the human glial fibrillary acidic protein (GFAP) promoter overexpress CCL2 in astrocytes and develop encephalopathy with impaired blood brain barrier function. GFAP is also expressed in hypothalamic cells, suggesting a possible influence of this transgene on reproductive function. During isolation of ovarian follicles for use in in vitro culture, we noted inconsistencies in numbers of follicles obtained from putative transgenic mice. Thus, to begin to examine reproductive parameters in female mice transgenic for CCL2, experimenters blind to genotype examined ovarian histology, follicular populations, and uterine histology in transgenic (n = 5) and wild type mice (n = 3). Tissue fixed in 10% neutral buffered formalin (SARL Scientific, Kalamazoo, MI) was embedded in paraffin, serially sectioned at 5-8 µm, and stained with Hematoxylin and Eosin. Examination of ovarian tissue allowed identification of transgenic and nontransgenic individuals, but uterine histology and follicular populations did not differ. Given the small number of animals in this preliminary study, further analyses are needed, and evaluation of tissues from additional animals is ongoing.

Seasonal Variance in River Otter (Lontra canadensis) Diet in Sandhill Wildlife Area, Central Wisconsin - (Biology)

By: Cole Walli, Madison Hodge
Faculty mentor(s): Justin Sipiorski

River otters (Lontra canadensis) are a keystone predator in North American aquatic ecosystems, and understanding their diet is crucial to understanding their enormous, season-to-season impact in the surrounding community members. River otter scat was collected approximately once per month in 2014 and 2015 from Sandhill Wildlife Area in southern Wood County of central Wisconsin. The scat was then processed and analyzed to determine seasonal variance in river otter fish consumption. We extracted fish cleithra (the major bone in the pectoral girdle of fish) from otter feces, and we used a recently published guide on fish cleithra published by the Michigan Department of Natural Resources to identify fish remains to species. Current data from 61 scat samples shows 14 species, with Brown Trout comprising the largest portion (38.94%) of river otter diet, while Central Mudminnow (30.65%) and Pumpkinseed (21.86%) contribute the second and third largest compositions. The substantial presence of Brown Trout remains in the scat samples suggests either larger-than-anticipated river otter ranges or currently undocumented brown trout populations in closer proximity to Sandhill Wildlife Area than previously found. We are also curious about any potential seasonal shifts that the otters make from one taxonomic group of fish prey to another. Perhaps there are dietary ramifications to shifting from one group of fishes to others.

Sexual Preference of Intact vs. Regenerated Tails by Lizards - (Biology)

By: Ted Struebing, Ronni Rae Schroeder, Ben Milzer, Mary Gertner, Lucas Kusak
Faculty mentor(s): Pete Zani

Lizards can regenerate their tails following the voluntary detachment of the tail due to predatory, threatening, or social interactions. The tail is a known social signal amongst lizards, that allows females to establish a mate preference. Therefore, we studied the female mate preference of side-blotched lizards related to intact or regenerated tails. We hypothesized female lizards will have a preference for the males with fully intact tails. To test this hypothesis, we placed one female, one male with an intact tail, and one male with a regenerated tail in an enclosure together and monitored the female mate-choice response. Our results should allow us to determine whether there is a sexual preference in females based on tail regeneration in the male lizards.

Simulating the Evolution of Reciprocal Altruism with Students - (Biology)

By: Samantha Vold
Faculty mentor(s): Brian Barringer

Evolution via natural selection occurs via differences in the survival and reproduction (i.e., differences in fitness levels) of individuals. Altruism, defined as any behavior that decreases individual fitness while increasing the fitness of others, is common in nature.

On the surface the evolution of altruistic behavior might appear hard to explain because individuals engaged in such behaviors suffer an associated reduction in fitness. However, it turns out that altruism can evolve via a variety of mechanisms, including both kin selection and reciprocal interactions among non-kin. When teaching these concepts to students they can be somewhat difficult to grasp. With that in mind, we have designed a college-level lab activity that can be conducted in conjunction with lecture material to help students better understand how altruism might evolve in a population over time. Student participants engage in a live-action simulation of a so-called iterated prisoner's dilemma model in order to explore how and under what circumstances the evolution of altruism via reciprocal interactions is likely to occur. We assessed learning outcome gains as a consequence of engaging in the activity using both pre- and post-activity quizzes. The results of this assessment are also discussed.

The Genetic Influence of Major Selection in College Students - (Biology)

By: Kelsey Blob, Kara Herr, Abigail Ullrich
Faculty mentor(s): Aaron Davis

The selection of an academic major is one of the most important decisions a student will make in terms of their college and professional careers, and many students change majors in pursuit of a field that suits their interests and talents. There are many factors that contribute to the selection of an academic major, but one factor, largely ignored, are possible genetic contributions. Several genes are known to be associated with traits that may influence academic major/career selection such as prosocial behavior (DAT1, CD38, OXT, OXTR, 5HTT), working memory (BDNF, HTR2A, WWC1), and stress perception (COMT, DRD2). The aim of this research is to determine if there is an association between an academic major and gene polymorphisms. To test this hypothesis we analyzed the genes of students at the University of Wisconsin-Stevens Point and looked for an association of genes within a given major. Our findings may help determine if genes play a role in major selection.

The Genetics of Performance in College Runners - (Biology)

By: Elliot Franczek, Andrea Ball
Faculty mentor(s): Aaron Davis

Recent research suggests that genes predispose an individual for athletic success. To date, several genes have been associated with elite athletic performance. We have previously shown that carriers of the ACE I allele have an advantage in endurance events while carriers of the ACTN3 R allele have an advantage in sprint/power events. The aim of this study is to expand on our previous findings and determine if other genes (ACSL1, ACVR1B, BMP2, GABPB1, NOS3, PPARA) also predict athletic success in a combinatorial fashion. To accomplish this we have characterized the alleles of several performance related genes in correlation with performance, as well as with high vs low trainability in sprinters and distance runners. We also analyzed the genotypes of each athlete in accordance with performance to identify the genes that predisposed an athlete for success.

The Influence of Temperature, Microhabitat, and Seasonal Timing on the Overwintering Behavior of Side-Blotched Lizards - (Biology)

By: Abby Pendergast
Faculty mentor(s): Peter Zani

Throughout the winter, reptiles utilize hibernacula (overwintering sites) to aid in survival. Previous research has shown that winter emergence from hibernacula is common and may be due to a variety of cues such as temperature, barometric pressure, or solar irradiance. For example, previous research on side-blotched lizards in our lab has implicated temperature as the main cue for emergence. This study focuses on the behavior of side-blotched lizards in nature with our goals being to clarify whether temperature influences i) emergence in an artificial hibernaculum ii) microhabitat preference, and iii) the seasonal pattern for emergence. To test these ideas we constructed an artificial overwintering site in the wild with multiple crevices. Wildlife cameras allowed us to quantify the activity of lizards during winter. Temperature data loggers in crevices as well as wind and irradiance data from a nearby weather station allowed us to link emergence behavior with environmental cues. Temperature and pressure best explain lizard emergence throughout the winter. Moreover, there are microhabitat differences in the timing of emergence, suggesting that microhabitat use within hibernacula is related to temperature. Temperature is also the primary factor responsible for an observed seasonal pattern of emergence. Overall temperature appears to be the main factor governing a multitude of behavior patterns in ectotherms.

Tracking GLUT4 Expression, Location, and Movement in Mouse 3T3-L1 Cells During Adipocyte Differentiation - (Biology)

By: Dylan Wodsedalek, Tyler Wittmann, Calvin Berndt, Jacob Jarzynski, Peter Schumann
Faculty mentor(s): Ed Gasque

When mouse embryonic cells are exposed to dexamethasone, isobutylmethylxanthine, and insulin in a medium with fetal bovine serum, they differentiate into adipocytes. Differentiating cells were stained via indirect immunofluorescence to track the location of GLUT4 glucose transporters over time. At 0, 2, 6, 8, 14, and 16 days from the start of differentiation, cells were: (1) fixed in methanol, incubated in saline with serum albumin to block non-specific antibody binding and detergent to permeablize cell membranes; (2) incubated with primary antibodies against GLUT4; (3) rinsed and incubated with fluorescently tagged secondary antibodies; (4) rinsed and mounted in an antifade reagent under a cover glass; and (5) observed and photographed using fluorescence microscopy. Captured images reveal the following progression: at 0 and 2 days, low levels of GLUT4 in the cells; at days 6 and 8, moderate levels of GLUT4 in the rough endoplasmic reticulum (RER), Golgi bodies, and a few vesicles; and at days 14 and 16, greater levels of GLUT4 in the RER, Golgi, and numerous vesicles. Throughout the time course of differentiation, fluorescent patches near the cell surface suggest incorporation of GLUT4 into the cell membrane. To confirm the latter, glucose levels in the medium are being monitored over the time course of differentiation. Finally, electrophoresis and immunoblotting will be used to compare amounts of GLUT4 expressed over time in cells undergoing adipocyte differentiation.

Using Antibodies from Virus-Immunized Egg Yolk for a Class Demonstration of Immunoassays - (Biology)

By: Nicole Karl, Riddhi Gandhi
Faculty mentor(s): Sol Sepsenwol

Immunoassays, the measurement of biological molecules at very low concentrations, are a multi-billion dollar industry. Immunoassay technology is an important part of the Immunology course (Biology 389). We would like to demonstrate how antibodies are generated in response to vaccines, how they are purified and how they are used to identify the agent in the vaccine without requiring lab facilities. Immunizing lab animals and purifying antibodies from their plasma is prohibitively expensive in training time and dollars. Instead, we have set up an experiment in which students can isolate antibodies (IgY's) from egg yolk from chickens that have been immunized against common poultry diseases. Since all large egg producers vaccinate against Newcastle virus (NCV), we would expect the yolks of store-bought eggs to contain antibodies against NCV (IgYNCV). The test to be used is called a "dot-blot," in which very low concentrations of NCV are applied to a sheet of protein-binding paper. The paper is incubated with IgYNCV antibody isolated from chicken yolk. This will form a two-molecule complex NCV- IgYNCV. Then the paper is incubated with an enzyme-labeled antibody (IgG*) that binds to any chicken IgY's. This will form a "sandwich" of NCV- IgYNCV -IgG*. When incubated with a color-reagent, the enzyme on the IgG* creates a color over the dot of NCV. By diluting the NCV, it is possible to demonstrate the exceptional sensitivity of such tests.

Variation in Prey-Capture Behavior and Anti-Predator Responses in Lizards - (Biology)

By: Bridget Walker
Faculty mentor(s): Peter Zani

Interactions between predators and prey are an important aspect of life history as these interactions determine the survival of the predator and/or the prey. Past studies have suggested that prey species with no distinctive pattern of anti-predator behavior have an increased chance of escaping from predators. Quantifying predator and prey behavior occurring in these interactions may allow us to find patterns of behavior and determine which strategies provide success for both the predator and the prey. Utilizing a predator-prey system involving side-blotched lizards and long-nosed leopard lizards, we placed field-fresh individuals of both species together in small arenas in the field and videoed the resulting encounters. We measured several aspects of predator-prey interactions including a prey's flee initiation distance, escape distance, maneuverability, and speed as well as a predator's prey-detection ability, approach behavior, pursuit distance, maneuverability, and speed. These data should indicate what kinds of inter-individual differences exist in predator-prey interactions as well as and what tactics enable success or failure for either the predator or prey.

White Noise Disturbance and Pair Bond Strength in Zebra Finches (Taeniopygia guttata) - (Biology)

By: Ashley Steadman
Faculty mentor(s): Sarah Alger

Environmental white noise affects song bird populations because it has the ability to mask any vocalization within the frequency range of the white noise envelope. Thus, it can mask important vocalizations that signal location, attract mates, and defend territories. For many social species, such as the zebra finch (Taeniopygia guttata), vocal communication plays a vital role in mate attraction, but less is known about the role of vocal signals in pair bond maintenance. If vocalizations play an important role in pair bond maintenance, then environmental white noise exposure may degrade established pair bonds. A repeated white noise disturbance treatment was applied on five established zebra finch pairs and a no noise treatment was applied on five other established zebra finch pairs at the University of Wisconsin-Stevens Point's Animal Care Facility. We then measured pair bond behaviors with the partner and with a novel opposite-sex individual (as a fidelity test). Mann Whitney U tests were used to determine if there are any significant differences in the means of specific pair bond behaviors with and without white noise exposure. My results did not show significance in pair bond degradation from white noise exposure. However, there is a trend with males that were exposed to white noise increasing the duration of clumping with their new partners. This experiment will ultimately give us a new perspective on how repeated white noise can affect song bird populations.

Ammonium Sulfate Selectively Extracts Invertase Activity from a Mixture of Precipitated Yeast Proteins - (Chemistry)

By: Rachel Cook, Anna Gontovic
Faculty mentor(s): Anthony Timerman, Jim Lawrence

The purpose of this work was to improve the first step in a sequence of Chemistry 365 laboratory exercises in which students purify the enzyme invertase from a yeast extract that contains many other different proteins. The essence of the first step in this protein purification exercise is to precipitate many different proteins using aqueous solutions of ethanol and then selectively extract soluble proteins from the pellet in a buffer composed of 10 mM sodium phosphate at pH 7.0. Our results show that the addition of ammonium sulfate to the extraction buffer greatly reduces the total mass of proteins extracted from the pellet with a minimal loss of extracted invertase activity. SDS-PAGE analysis of the final fraction prepared by this modified method reveals a sample with fewer number of contaminating protein bands than that observed in a commercial sample of "pure-invertase" purchased from Sigma Chemical Company.

Atomic Layer Deposition of Manganese Sulfide Thin Films for Applications in Energy Conversion and Storage - (Chemistry)

By: Alexandra Koegel
Faculty mentor(s): Shannon Riha

As our current sources of energy continue to cripple the environment, perhaps beyond repair, an answer for clean, sustainable, and affordable energy becomes more pertinent to society's well being. With applications in solar energy conversion and energy storage, manganese sulfide (MnS) is a potentially useful material for addressing the energy challenge. MnS has three principle phases: a high-temperature stable alpha phase and two low-temperature metastable phases, beta and gamma. Here we demonstrate the phase-controlled deposition of MnS thin films using a novel deposition technique called Atomic Layer Deposition (ALD), which is based on sequential and self-limiting surface chemical reactions. Gaseous phase hydrogen sulfide and manganese (II) bis(ethylcyclopentadienyl) were deposited via ALD to yield pure γ-phase MnS thin films at deposition temperatures≤150˚C and a mixture of the γ- and α-phase MnS at temperature between 150-225˚C. Thin films were characterized using in situ and ex situ techniques including quadrupole mass spectrometry (QMS), quartz crystal microbalance (QCM), scanning electron microscopy (SEM), and x-ray diffraction (XRD). Finally, to demonstrate its potential in energy storage applications, both α- and γ-phase MnS thin films were deposited on copper foil and tested as the anode for a Li-ion battery. Excellent battery cycling stability and near-theoretical capacity make MnS a possible replacement to the traditional graphite anode in a Li-ion battery.

Characterization of Products from Hydrolysis of a Sustainable Thermoset - (Chemistry)

By: Luis Camacho
Faculty mentor(s): John Droske

Thermoset polymers are high strength, durable materials that are used in demanding applications. The three-dimensional crosslinked structure of thermosets makes them especially well-suited for applications where insolubility and thermal stability are desired. Our group has developed a class of polymers that is able to crosslink via thiol pendant groups on the main chain. When heated, the thiols undergo a curing process forming high quality films or other plastic components. Thermoset materials usually are very difficult to recycle due to their 3-d crosslinked network structure. However, our cured samples undergo hydrolysis under heat and pressure forming clear aqueous solutions. This poster will present our efforts to characterize the products resulting from hydrolysis of the cured resins. The results of HPLC and GCMS, such as identification of monomeric diol in the hydrolyzed solutions, will be presented.

Computational Investigation of the Stacking Interactions Between DNA Base Pairs and Different Protonated Forms of Quercetin - (Chemistry)

By: Sierra Giebel, Paul Nowak, Mikayla Schaalma, Lily Wanta
Faculty mentor(s): Erin Speetzen

The ability of flavonoids to interact with DNA is of great interest, as many flavonoids are components of traditional Chinese medicines that exhibit anti-tumor activities with few or no side effects. Quercetin is one of the flavonoids most widely consumed in the human diet and is contained in many traditional Chinese medicines. Quercetin is known to intercalate into DNA and act as a topoisomerase I poison, which may help to explain its anti-tumor activity. As such, gaining a better understanding of how quercetin interacts with DNA may lend insight into the development of novel anti-tumor drugs. Quercetin contains five hydroxyl groups, two of which have pKa values near physiological pH. The effect that deprotonation of these hydroxyl groups has on the ability of quercetin to form stacking interactions with DNA base pairs will be examined using computational methods.

Development of Methods for Assessing the Exposure of Wildland Firefighters to Polycyclic Aromatic Hydrocarbons (PAHs) Contained in Fine Particulate Matter - (Chemistry)

By: Christian Krause, Wyatt Beyers, Anna Radke
Faculty mentor(s): David Snyder

In the course of their duties, Wildland firefighters are routinely exposed to high levels of wood smoke containing fine particles, known as PM2.5. These particles are of particular concern due to their ability to penetrate deep into lung tissues, cause inflammation and oxidative stress, and deliver toxic compounds into the bloodstream. Fine particle emissions from biomass burning, including forest fires and the controlled burning of vegetation, have been shown to contain toxic compounds, including polycyclic aromatic hydrocarbons (PAHs) that are known or suspected carcinogens. In order to assess the exposure of Wildland firefighters to these compounds, a wearable instrument pack was developed to monitor and collect PM2.5 during firefighting operations. Data and samples were collected during controlled burns conducted by the UWSP Fire Crew at the Treehaven natural resource education, conference, and research center located near Tomahawk, Wis., in April 2015. An analytical method was then developed for these samples that involved the use of Soxhlet extraction followed by the identification and quantification of PAHs via gas chromatography/mass spectroscopy (GC/MS). A discussion of the method and the challenges encountered during its development will be discussed. Preliminary results from the controlled burn study will also be presented.

Evaluation of Thiol-Functionalized Polyesters for Removal of Dissolved Lead from Water - (Chemistry)

By: Zachary Hecht
Faculty mentor(s): John Droske

Exposure to lead causes serious long-term health effects and, in particular, affects the development of the brain and nervous system of children. Our group has prepared a series of polyester copolymers containing pendant thiol groups, a functional group that is known to bind heavy metals. With recent interest and awareness of the importance of removing lead from drinking water, we set out to determine the efficacy of the pendant thiol groups in our polymers for removing dissolved lead in aqueous solutions. Samples of the copolymers were prepared from mercaptosuccinic acid and 1,2-propylene glycol. These copolymers were cured for varying times to give crosslinked resins containing differing amounts of thiol pendant groups. The samples were exposed to lead chloride solutions (150 ppb Pb) for varying times. After filtering, the samples were analyzed by Inductively Coupled Plasma – Optical Emission Spectrometry (ICP-OES) which showed that these copolymers effectively removed lead from the solutions.

Generation and Study of Trapezoidal Arylene Ethynylene Complexes - (Chemistry)

By: Herh Vang
Faculty mentor(s): Nathan Bowling

Arylene ethynylene trapezoids were synthesized to study their electronic properties when a transition metal is present. Binding of the transition metal to the two pyridine arms results in the formation of a metal-ligand complex. In the parent molecule, which contains a central benzene ring with two pyridine arms, transition metal binding should not significantly inhibit free rotation of the aromatic core. To introduce steric bulk to the central ring, two addition aryleneethynylene trapezoid molecules were created with alkoxy groups bonded to the central benzene ring in a para configuration. The primary focus of this study was to determine how the presence of transition metal binding would influence the rotation of the alkoxy-functionalized, central benzene ring. To see if these effects were size dependent, one trapezoid had small, dimethoxy side chains added and the other had large, dialkoxy side chains. Electronic property studies were done via UV-vis to compare and contrast the aryleneethynylene trapezoids. In the parent system, there seems to be a modest increase in conjugation upon transition metal binding. The dimethoxy and dialkoxy side groups, on the other hand, seem to negate this electronic effect.

Halogen Bonding Arylene Ethynylenes in Host-Guest Chemistry - (Chemistry)

By: Rebecca Plahuta
Faculty mentor(s): Nathan Bowling

Design of ethynylpyridine ligands as bidentate intermolecular halogen bonding receptors has proven to be an interesting challenge in regards to identifying the proper size and

orientation of a dihaloarene halogen bond donor. Because the halogen bond distance (C-X···N) is approximately 5.0 Å, which differs from the C-C≡C-C distance of approximately 4.0 Å, a slight bend in the alkyne is necessary to accommodate the non-covalent halogen bond in intramolecular halogen bonding systems. However, when applying these same ideas to intermolecular bonding (e.g. bidentate halogen bonding receptors), this angle strain is enough to make association unfavorable. Studies thus far suggest misalignment of bidentate halogen bond complexes, where only monodentate bonding is feasible when 1,3,5-triiodo-2,4,6-trifluorobenzene is introduced to the host. It appears that the balance of entropy and enthalpy is unfavorable for using dihaloarene guests in intermolecular halogen bonding systems, with the entropy cost exceeding the enthalpy gain and the systems producing an unfavorable change in free energy. Calculations suggest that using dibromovinylidenes as guests might produce a stable halogen bonding complex with a favorable change in free energy.

Making an Iron Complex as a New Catalyst for Hydrosilation - (Chemistry)

By: Zhihan Liu
Faculty mentor(s): Robin Tanke

In this poster presentation, I will present first steps to the preparation of iron compounds as catalysts for hydrosilation. The catalysts could replace precious metals in the process of making silanes, reducing the cost. A ligand, 2,6-bis(N-pyrazolyl)pyridine, was prepared first. Potassium t-butoxide was used to deprotonate pyrazole in dry diglyme under inert atmosphere. Second, 2,6-dibromopyridine was then entered the reaction by reacting with the intermediate from last step. Thin Layer Chromotography as well IR, H1 NMR and C13 NMR spectra were then taken and analyzed to confirm the identity of the product and purity by comparing data with literature reference. The ligand was then reacted with iron(II) chloride tetrahydrate in dry THF under nitrogen at room temperature for 12 hours to form an iron complex. An IR spectrum was then taken and analyzed to confirm the identity of the product by comparing data with literature reference. Magnetic susceptibility was then checked using a magnetic susceptibility balance to assure the iron compound is paramagnetic.

Mechanistic Studies of Linker Exchange In a Metal-Organic Framework - (Chemistry)

By: Austin Schlechta
Faculty mentor(s): Joseph Mondloch

Porous solid-state materials are ubiquitous in everyday society. Unfortunately the rational design of porous solid-state materials is often fraught with challenges. Metal-organic frameworks are an emerging class of solid-state materials built up from inorganic (metal-containing) nodes and organic linkers. Using a Zn-imidazolate based metal-organic framework, the mechanism of a synthetic strategy termed solvent-assisted linker exchange was studied using proton NMR spectroscopy. Linker-dependent kinetic studies suggest that a new mechanism is operational and our results may provide insights into the rational design of new and improved porous solid-state materials.

Modeling Protein Dynamics in the Human D-Amino Acid Oxidase Protein - (Chemistry)

By: Shaelyn Christman, Marie Dobernig
Faculty mentor(s): Amanda Jonsson

In human brains the protein d-amino acid oxidase (hDAAO) plays a key role in modulating the degradation pathway of the important signaling molecule D-serine. The deregulation of D-serine signaling has been linked to schizophrenia susceptibility and certain mutations in the hDAAO protein itself are associated with familial amyotrophic lateral sclerosis (ALS). Mutations in the hDAAO protein are known to impact protein function and stability. We use molecular dynamics simulations to study how the protein moves over time and how the protein dynamics are altered by mutations in the amino acid sequence.

Oxidation States "Naturally" - (Chemistry)

By: Neil Foegen, Chelsea Mueller, Albert Webster
Faculty mentor(s): Jason D'Acchioli, Erin Speetzen

Electron movement is at the heart of chemical reactivity. Oxidation states (OSs) help categorize and explain (more often than not) what governs chemical reactivity. But the idea of oxidation states is still rife with conflict—should it be used? Does it mean something? Our work proposes to help guide us in showing both the utility of OSs, and how they are still an active, lively debated area of research.

Sprint and Endurance Genes in Division III College Swimmers - (Chemistry)

By: Lindsey Price, Rachel Thorson
Faculty mentor(s): Aaron Davis

Are the fastest swimmers the product of environment (training and nutrition) or do they carry favorable genes that give them a competitive advantage? In recent years the field of performance genetics has identified several genes that contribute to enhanced athletic performance at elite levels of competition, however it is unknown if any of these genes favor athletic performance at lower levels of competition. In order to determine the contribution of genes to athletic performance we characterized several genes in Division III College swimmers. We focused on genes related to sprint performance (ACTN3, BMP2, ACVR1B, PPARA) or endurance performance (ACE, ACSL1, GABPB1, NOS3). We compared these genes with the performance of specific events swam and the time of rest needed for optimal performance, specifically for each swimmer. We also analyzed the effect that favorable alleles might play in a swimmers ability to improve performance over their college career.

Testing the Limits of Intramolecular Halogen Bonding - (Chemistry)

By: Alejandra Perez
Faculty mentor(s): Nathan Bowling

Halogen bonding is the attraction between an electron donor and the electropositive region of a halogen. Designing molecules that exhibit intramolecular halogen bonding provides the opportunity to investigate this relatively weak interaction without entropic complications. In prior studies, “activated” halogen bond donors, with electron-withdrawing fluorine groups, have exhibited strong tendencies toward intramolecular halogen bonding. The purpose of this study is to investigate intramolecular halogen bonding in the absence of electron withdrawing groups, or non-activated systems. Intramolecular halogen bonds within activated systems (A) are formed from quinoline based molecules, where electron donor and acceptor units are linked by an aryldiyne bridge. Conversely, when electron-withdrawing groups are removed, the crystal structure of compound B reveals halogen bond driven dimer formation. Several factors, such as increased N···I distance or decreased π-π stacking propensity of non-fluorinated rings, that explain the differences in crystal behavior between A and B are currently being explored.

Twists and Turns: WGS ‘catalysts’ of Fe, Ru, and Os - (Chemistry)

By: Wulff Fuentes Eugenia, Alexandra Eschmann
Faculty mentor(s): Jason D'Acchioli

Hydrogen gas is an attractive alternative to using petroleum-based energy sources. Generating hydrogen through the water-gas-shift reaction is one method, but is usually energy intensive (high temperatures and pressures). Our group is exploring the use of organometallic compounds to catalyze the reaction.

Cerberus: Centralized Authentication Service - (Computing and New Media Technologies)

By: Daniel Cronce, Joshua Krueger, Samuel Elzinga
Faculty mentor(s): Daehee Kim

Cerberus is a centralized authentication service that offers its users granular control over the authentication and authorization of their services. This allows developers to think less about their authentication and authorization mechanisms and more about what their service will accomplish. We will approach this by developing a core library, server, and client. The server will be hosted by the network administrators, and the client will be implemented by the services. After registering with Cerberus, the service owners simply call the API functions of the client to create and authenticate their users. The authentication flow is fairly simple. The user attempts to authenticate against a service, and the service sends the credentials to the Cerberus client. The client creates an authentication request and encrypts it with the key derived from the user-provided password. The client then sends the encrypted request to the Cerberus service. Once Cerberus receives the encrypted request, it attempts to decrypt it using the derived key stored in the database. If the decryption is successful, then the password must have been correct. If so, Cerberus sends back the permissions and roles for the user. Otherwise,

Cerberus sends back an authentication error. The requesting service is responsible for interpreting the permissions. We expect building this service will help secure, rapid-development in open-source services.

Jbox: The Digital Jukebox - (Computing and New Media Technologies)

By: Mitchell Vana
Faculty mentor(s): David Gibbs

This project consisted of creating a prototype software application that functions much like a traditional jukebox found in an establishment – with some additional features. The application was built upon the .NET Framework using the C# programming language. Data storage and retrieval is handled by the ADO.NET component of .NET. Interface elements were created with Windows Presentation Foundation and Inkscape. On first interaction, users are presented with album art corresponding to the currently playing song and can tap it to learn more. A song selection menu provides access to the entire library of media provided by an establishment. A song's title, artist, and genre(s) are all visible along with its cost (set by the establishment) and rating (determined by users). To influence the rating of a song, a user may simply tap the desired rating star and the jukebox will take care of the rest. Users can search based on a song's title, artist, genre(s), and cost all at once. Songs are returned when a partial match is made in one of the categories. More than one search term will further refine what is matched. Playlists allow users to create lists of their favorite songs for quick purchasing and queuing. Songs can be easily added to, removed from, and adjusted in a playlist to satisfy the user's wants. Titles can be given to playlists and even used more than once if so desired by a user. Users can create and log in to an account which allows them to rate songs and create playlists.

Model Selection by Performance of Machine Learning Algorithms - (Computing and New Media Technologies)

By: Daniel Cronce
Faculty mentor(s): Robert Dollinger

Using a multitude of machine learning algorithms, I will be training models to correctly classify data. I will then compare the precision, recall, F1 score, and training time of these models and choose the best one. After obtaining a sufficiently high F1 score, I plan to calculate the odds ratio of each of the input features. The result will be a table of the models' metrics, the selected model, a table of the top odds ratios, and a reflection of my thoughts on why the selected model performed better.

UWSP Ease of Hours - (Computing and New Media Technologies)

By: Chase Jaime, Joseph Wilson, Jack Cooke
Faculty mentor(s): Daehee Kim

UWSP Ease of Hours is a project based on the concept of ease of access and consolidation. The hours of operation of different buildings and locations can vary dramatically campus wide. The hours of when dorms, computer labs, academic buildings, and other services on campus are open each vary and can almost exclusively be found on

their respective web pages. These hours of operations are also not always listed in a straight forward location or easy to read. What UWSP Ease of Hours aims to do is consolidate all of these hours into a cloud based database which will be accessed by a downloadable mobile client supported by Android and iOS. This in turn will save the users time and unnecessary hassle of having to search the web for each individual locations' hours. The approach being used to develop this project is in two parts. The first part is the mobile application. This client will be developed using Ionic and Cordova frameworks. Using these two frameworks UWSP Ease of Hours will be easily implemented for both Android and iOS. The second part is the database running on the server side of the project. This will consist of an Ubuntu server running MariaDB. The data gathered from the buildings, including building numbers, locations, and hours will be placed in the database created in MariaDB which will then be accessed by the mobile application to display the data.

Fossils Under The Microscope: A New Perspective to Past Environments - (Geography and Geology)

By: Bryan W. Hoff
Faculty mentor(s): Neil C. Heywood

During summer of 2015 I visited one of the richest Eocene fossil sites in North America, near the Flaming Gorge Reservoir in southwestern Wyoming. During analysis the overlying Bridger formation emerged as being at the border of our collection site. None of our geologic maps definitively exhibited a distinct formation boundary at this location. My research utilized three different techniques to analyze and differentiate between the Green River and Bridger Formations. The first was microscopic thin section analysis of rock samples, which produced counts and estimates the rock matrix composition. The second technique was loss-on-ignition (LOI), in which crushed samples were heated at varying temperatures to progressively burn off different compositional components, yielding the percentage of rock compounds. Lastly, I used Energy Dispersive X-ray Spectrometry (EDS) to identify distinguishing elements and minerals between samples.

The Regeneration of TID 5 - (Geography and Geology)

By: Lindsey Kemnitz, Peter Strommen, Ronald Hetzel, Jennie Stage, Ashley Diaz
Faculty mentor(s): Ismaila Odogba

Tax Increment District 5 (TID 5), a type of Tax Increment Financing (TIF) district, was established in 2005 by the city of Stevens Point with the sole purpose of redeveloping blighted areas, enhancing revenue flow, and creating more employment opportunities. TID 5 is currently not generating the expected benefits. This project focuses on the identification of means by which TID 5 can be successful in achieving its original goals. We began by exploring the current state of TID 5 and the relevant ordinances for the district. Next, using indicators such as region, population size, median income, type of district, location along a thoroughfare etc., we identified comparable cities in the Midwest with similar TIF districts to TID 5. Using a case study approach we determined the factors which made the comparable TIF districts successful or unsuccessful and how these factors might impact TID 5. Finally, we make recommendations to the city of Stevens Point regarding TID 5.

Using an Augmented-Reality Sandbox to Aid in Contour Map Interpretation - (Geography and Geology)

By: Ross Thorn, Stephen Schuessler
Faculty mentor(s): Keith Rice, Ray Reser

We propose the use of an augmented-reality sandbox (ARSB) to aid in the instruction of contour map interpretation.The ARSB uses an Xbox Kinect sensor to detect relief changes in a sandbox below it. The sensor takes that information into a software program on a Linux operating system and projects contour lines onto the sand that reflect the topography in real time. Subjects were asked to identify areas of steep gradient and high elevation in an area depicted by a topographic map on a tablet. The subjects then interacted with the ARSB for a time period, free to change the landscape as they wished. The subjects were then asked to identify areas of steep gradient and high elevation just as before on a different map. Finally, subjects were surveyed to see if the ARSB was helpful in demonstrating the concept of contour mapping and if they felt that their map interpretation skills increased from interaction with the ARSB. Through this project, we hope to gain insight on three-dimensional terrain modeling and if it helps people to interpret flat contour maps better. If the ARSB is successful in helping subjects to interpret the two-dimensional contour maps, then the implementation of ARSBs in classrooms would be a reasonable investment for Geography classrooms across the world.

UWSP Geology Outreach Program Participants: 2015-2016 - (Geography and Geology)

By: Bryan Hoff, Keaton Katarincic
Faculty mentor(s): Neil C. Heywood, Kevin P. Hefferan

The UW-Stevens Point Museum of Natural History is fortunate to have an extensive collection of fossils, rocks, and mineral samples. Thousands of fossils as part of the Biology collection, and over 900 more in the Geology collection, are currently available for learning and research. Some of these were part of the 2015 and 2016 UWSP outreach program days, such as College Days for Kids, STEM Exploration Days, Museum Collection Crawl, the regional Science Olympiad, and visits to local schools. The purpose of this study was to identify correspondence between use of the samples housed by UWSP and increased awareness of the programs offered. This survey revealed an increase in scores at the Science Olympiad, and increased requests for outreach programs. Such interest and participation illustrated the importance of these events to promote geology, which is among the growing fields within the natural sciences.

"Action or Inaction:" Wisconsin State University and the Fair Housing Crisis of 1967 - (History)

By: Kyle Ebelt, Ryan Bottomley, Jordan Straight, Kendall Taivalkoski
Faculty mentor(s): Lee Willis

Our research investigates the history of housing discrimination in Portage County, specifically using Wisconsin State University history professor Jimmie Franklin as a lens

through which we analyze the macro-problem that existed both locally and throughout the United States. Dr. Franklin was hired by the university in 1966. Seeking a larger residence for his family the following year, Franklin encountered racially restrictive covenants that prevented African American renters. Although he faced many complications, Dr. Franklin and his colleagues in the College of Letters and Science challenged university administration to take a stand against restrictive covenants and to pressure the Stevens Point Common Council to pass a fair housing ordinance in the fall of 1967. We use interviews with Dr. Franklin and other faculty members who worked during Franklin's time, as well as archival and county records to demonstrate how one professor changed a community.

A Moral War?: Syrian Refugees and Grappling with Global Citizenship - (History)

By: Cailie Kafura
Faculty mentor(s): Valerie Barske

In this research project, I begin by laying the groundwork for the Syrian Refugee Crisis by considering the deeply entrenched roots that are interwoven with the history of the United States, France, Lebanon, and World War I, examining themes of imperialism and globalization. To first build the foundation for understanding Syria's historical standing in the world, I utilize recorded joint hearings of the United Nations, archived memoirs of Syrians, media coverage, and peer-reviewed research to situate the contemporary refugee crisis. More specifically, I examine the ways in which the UN High Commissioner for Refugees (UNHCR) handles the socio-cultural realities including childhood PTSD, human rights violations, and everyday life in the refugee camps. Furthermore, I analyze the recurring theme of xenophobia perpetuated through the media and "Western" politics. My research seeks to illustrate how Syria's historical trauma has placed the European Union, the UNHCR, and the United States at a moral crossroads as they navigate the ethical path towards handling Syria's complicated refugee crisis.

Artistry on Point: A Student Exhibit at the Scarabocchio Art Museum - (History)

By: Emily Gostonczik
Faculty mentor(s): Sarah Scripps

Artistry on Point: The Legacy of David L. Smith was an exhibit at the Scarabocchio Art Museum curated by students in the upper division history course, "Museum Exhibits." It examined the ways art can shape a community's sense of place and local identity. Using UWSP Associate Professor Emeritus David L. Smith's work as a case study, the exhibit explored how Smith built upon the long legacy of the Wisconsin Idea in establishing a museum entrusted to the public. By situating Smith's contribution within a broader historical context, it called on visitors to consider the ways in which art contributes to civic engagement in our city and in our state. Students in HIST 395 were in charge of all aspects of the project including curation, design, installation, and publicity. The target audience for the exhibit included UWSP students and faculty, the local art community, and visitors to Stevens Point.

Baking Bread, Making Bombs: Ideology and Roles of Women in Nazi Era Germany - (History)

By: Rachel Lintereur
Faculty mentor(s): Valerie Barske

In this research, I evaluate the dichotomy between the Nazi ideology of the "ideal" woman, including the idea of the "neue frau" or "new woman," and roles that women negotiated as part of the Nazi Party from 1933-1945. My research will examine social, cultural, historical, and political influences on women via the Nazi regime, from primarily a German perspective, while examining interpretations from other countries, including both primary and secondary sources. Specifically, I demonstrate that the roles of German women including as secretaries and nurses directly conflicted with the official ideology the Nazi regime of "Kinder, Küche, Kirche" (children, kitchen, church,) portrayed through propaganda, regulations, and government programs including marriage loans and the Winter Relief Program. As World War II began, many countries, including Germany, sought victory through pulling everyone, including women, into the war effort. Through this research, I articulate that feminine roles portrayed in Nazi era Germany stood in stark contrast to the reality of women in the World War II era, and the Nazi's defense of contradictions evident between the ideal and reality.

Examining Peace-Building Methods in Africa - (History)

By: Rilee Newell
Faculty mentor(s): Valerie Barske

This research examines Ubuntu philosophies of peace-building in South Africa, which emphasize empathy, forgiveness, love, and restorative justice. Using primary source digital publications and secondary peer-reviewed journal articles from the social sciences and cultural studies, I will explore the ways in which local populations in African nations engage with both indigenous and global approaches to peace-building. I will compare and contrast peace-building approaches promoted by international NGOs with local methods. My preliminary research suggests that international methods prove less effective because they do not focus on psycho-social and spiritual dimensions. I also consider how methods of peace-building speak to the ways in which local populations negotiate complex identities and global citizenship. In the end, I hope to shed light on how local philosophies may play a central role in trans-national conflict resolution.

Examining the Roma: Traveling Persecution - (History)

By: Alexandra Haag
Faculty mentor(s): Valerie Barske

In this research project, I examine the persecution against the Roma people in Eastern Europe. According to an official hearing of the Committee of Security and Cooperation in 2009, the Roma represent the largest ethnic minority in Europe. Although the Roma have resided in Europe for many centuries, they continue to be stereotyped and persecuted. Due to their nomadic lifestyle and their own unique traditional culture, they have been singled out and persecuted for many centuries. In my research, I investigate the ideology and legitimization of the persecutors, the Roma's self-representation, and the

issues addressed by The International Romani Union (IRU founded 1971). The persecution of the Roma, although receiving less media coverage than other contemporary events, remains a prevalent problem in Eastern Europe and recognized by global organizations. My hope is that by becoming more aware and educated on this issue, we may move to end discrimination and violence.

Export and Exploit: Colombia's Resources, Economic Condition, and Agrarian Reforms - (History)

By: Dacia Giordana
Faculty mentor(s): Valerie Barske

In my research, I investigate the current political, social, and agricultural state of Colombia. I explore how deforestation, social corruption, and demand for resources contribute to an international trade protocol that is neither sustainable nor healthy. More specifically, I argue that Colombia's export-based economy represents broader struggles with exploitation within Latin America. Geopolitically, Colombia is situated at a crossroads between global demands for consumerism and national stability. More specifically, I examine INCORA Law 135 (1961), as well as other attempts at agrarian reform from the 20th century through the present. I analyze archival accounts critiquing the law along with recent scholarly articulates that emphasize the strain of globalization. Although agrarian reforms seek to close the large wealth gap, poverty remains an increasingly intensified problem. Depletion of land and culture in Colombia is only increasing with time, and as global citizens we need to be aware of the effects international consumerism has on the quality of life for people in export-based countries.

Globalization and Japan: Gender, Nationalism, and New Media - (History)

By: Alan Bustamante, Michael Marichal
Faculty mentor(s): Valerie Barske

Our research analyzes how Japanese media portrays the evolution of Japanese nationalism throughout the 20th century through the changing depiction of masculinities. We complicate the popular notion of homogeneity in postwar Japan by demonstrating how new ideas of masculinity in the postwar environment created a greater plurality of identities. Following the collapse of the Japanese empire, which overly simplified masculinity by equating manliness with militaristic values, new cultural identities of the 1950s and 1960s redefined the masculine in terms of earning power. Combined with cultural ramifications from the U.S. Occupation (1945-1952) and long-standing beliefs of social harmony, the ideal masculinity of the Cold War became the white-collar office worker or salaryman. Both Japanese and "Western" media tend to portray the postwar Japanese environment as homogenously centered around the salaryman ideal. However, since the collapse of Japan's bubble economy in the 1990s, the image of masculinity in the Japanese media has grown increasingly complicated. For example, a growing group of young men and women known as freeters actively oppose the salaryman identity and encourage self-empowerment in engagement with global neoliberal values. In this study, we contribute new analytical insights on the intersections of freeter culture in new media, alternative masculinities, and negotiations with neoliberal global identities.

Indigenous Intercultural Bilingual Education in Latin America - (History)

By: Kelsey Nocek, Cassie May
Faculty mentor(s): Valerie Barske

In this research project, we examine how the Indigenous Intercultural Bilingual Education (IIBE) model (1994), has increased literacy among indigenous peoples in Latin America, but has also caused a need for indigenous peoples to negotiate their own cultural identities. Initially, this program was established to homogenize indigenous cultures with European Spanish cultural practices and governmental initiatives. The bilingual education of these cultures forced a suppression of Indigenous languages, hindering academic success. By looking at primary source charts that analyze effectiveness with the evolution of IIBE as well as secondary scholarly journals, we study the impact of this model on indigenous peoples from 1994 to 2015. In addition we explore how indigenous peoples challenged the IIBE to focus more on local goals. By considering the evolution of the IIBE, we seek to recognize the move from homogeny toward acknowledgment of indigenous aspirations and needs. In the end, our research seeks to contribute to broader theoretical as well as on the ground conversations about the realities of globalization and global citizenship.

Keeping A Civil War Civil: European Responses to the American Civil War - (History)

By: Randall Wotruba
Faculty mentor(s): Valerie Barske

This research project examines how a seemingly domestic civil war has international implications. Although domestic in nature, the American Civil War (1861-1865) impacted global issues particularly for the dominant powers in Europe. Nations including Great Britain, France and Germany had relations with the Union North and the Confederate South. These relations caused a serious conversation in Europe about possible intervention to mediate and resolve the war. Ultimately, the European powers opted for neutrality. I utilize peer reviewed journal articles and primary sources including newspaper articles and correspondence between Britain, France, and Germany to create a vibrant research presentation of a living history through a global and international framework. I explore how apparent the decision of neutrality was from European perspectives after the announcement of the Emancipation Proclamation (January 1, 1863). Through this approach, I examine the extent to which emancipation framed how the American Civil War was viewed from an international perspective.

Moving and Mothering Russia: The Soft Power of Embodied Actions in Russia - (History)

By: Celia Sweet
Faculty mentor(s): Valerie Barske

In this research project, I examine how embodied actions and performances as protests engage with issues of politics and gender in Russia. My research explains the roles and

expectations of women during the Soviet Era (ca. 1917-1991) in comparison with post-socialist Russia, showcasing continuity as well as change. To challenge gendered expectations in 2012, Pussy Riot, a punk-rock protest group, performed at the Russian Orthodox Church, enraging President Vladimir Putin's administration and landing the three young female performers in jail. Analyzing books, articles, primary and secondary sources from scholars of gender studies, history, and anthropology, I identify how embodied actions signify specific meanings in terms of gender, religious beliefs, and post-socialist Russian cultural practices. My theoretical and methodological approach builds on the work of Drid Williams (1982), Brenda Farnell (2014), and other scholars working on "dynamic embodiment." I seek to demonstrate why embodied actions are so powerful and why women using their bodies to oppose politicized gendered roles made their performance even more significant.

Rosholt Pioneer Museum Public History Project - (History)

By: Aaron Gurholt, Bethany Barlowski, Skylor Heindel
Faculty mentor(s): Sarah Scripps

The Rosholt Pioneer Museum was in dire need of helping cataloging new acquisitions and has also asked for assistance in curating and advice on museum management. Last summer, we embarked on an internship to assist with researching new donations and cataloging their current collections. The museum has lacks paid staff and does not have the limited resources and time to spend on historical research and collection organization. Over the course of the summer, we successfully digitized a full catalog of artifacts. In addition, we updated several exhibit spaces through updating panels and reorganizing the displays. Through this internship, we gained valuable experience in collections management and exhibition development while helping a small local historical society preserve their legacy.

Sex Talk: Addressing Sexual Health in Latin America through Sex Education - (History)

By: Blaxton Bucklew
Faculty mentor(s): Valerie Barske

Sexually transmitted infections (STIs) and diseases have only become an international public health concern for a relatively small amount of time. The first case of HIV was first observed and reported in 1981, with little research of the incidence and death rates from STIs before that time. Today, the World Health Organization (WHO) affirms, "sexual and reproductive health education is one of the most important and widespread ways to help adolescents to recognize and avert risks and improve their reproductive health" (2008). This study analyzes the current incidence of STIs and the efficacy of current programs and efforts in reducing the transmittance of STIs in Latin America through education about sexual health. The study will look specifically at Colombia, relying on reports from international public health organizations from 1982 to 2014. Through assessing access to programs and identifying changing attitudes towards sex, demonstrating the efficacy of these programs will provide evidence to influence future policy decisions regarding sex education.

The Culture of Machismo: Gender Stereotypes in the Dominican Republic and Cuba - (History)

By: Allison Reed
Faculty mentor(s): Valerie Barske

In this research project, I assess the impacts of a machista culture in the Caribbean from a socio-cultural standpoint. The cultural perception of machismo in most of the Caribbean is a concept that dictates the performance of gendered roles for men and women in society, stereotypically depicting women as subordinate to men in all aspects of life including social, economic, and political spheres. Specifically, I analyze how machista attitudes in the Dominican Republic and Cuba have influenced gender attitudes and gender roles. In my analysis, I consider the time period between 1975 and 2015. I examine peer-reviewed journal articles, news articles, and books ranging from research done by Antonia Ramirz looking at the Dominican Republic and the Federation of Cuba Women in the 1970s through today with authors including Donette Francis and female Cuban rap groups such as Krudas Cubensi. I hypothesize that tensions between feminist movements and machismo stereotypes continue to intersect in the formation of attitudes towards gender roles in Cuba and the Dominican Republic. Overall, my research will show that machismo and feminism are not mutually exclusive influences, rather they connect in complicated ways.

The EU, Globalization, and Debates over an "Ever Closer Union" - (History)

By: Andrew Worlin
Faculty mentor(s): Valerie Barske

Europe stands at a crossroads between realizing an "Ever Closer Union" or a return to national sovereignty. In the 1957 Treaty of Rome that created the European Economic Community, member nations resolved to strive for an "ever closer union," such that warfare might become unthinkable. The EEC worked towards what Winston Churchill called a "United States of Europe." Now, however, the EU faces unprecedented economic, political and demographic crises that threaten to halt or even roll back the once inexorable tide of integration. My research examines both archival documents and preparations for upcoming political events such as the UK's EU Referendum (June 23, 2016) to analyze the multitude of ideas on globalization and transnational cooperation. Along with France's National Front, the UK's membership referendum is merely the most visible aspect of the challenge to the power of Brussels. Ultimately, ongoing questions continue over how to negotiate trans-nationalism that transcends borders along with enduring notions of separate nation-states in a globalizing context.

The Rise of Korean Cool: Transformation of South Korea through Neoliberalism - (History)

By: Dustan Erickson
Faculty mentor(s): Valerie Barske

In this research project, I evaluate how South Korea employs "soft power" through the marketing of popular culture to enhance international relations. Following colonial and military occupations by both Japan and the U.S., the contemporary Korean economy now competes with leaders in world economies. The economic foundation has allowed Korea's pop culture to flourish on a global scale. Since 1994, South Korea has employed the increase in popularity of Korean pop culture, known as the "Korean Wave" (Hallyu), packaged to surrounding countries such as Taiwan , Vietnam, and the Philippines. Emerging as a major exporter of popular culture intersects with other ideas and policies tied to globalizing trends of neoliberalism. Through the theoretical frameworks of neoliberalism and soft power, I analyze how popular stars such as CL (Lee Chae-rin) and Psy link Korean culture with the global community. This development of a Korean Wave shows us the force of globalization and how it affects a given nation and national culture.

This Poster is Brought to You by the Letter D: Diplomacy, Democracy, and Dollars - (History)

By: Joshua Panter
Faculty mentor(s): Valerie Barske

In 1966, Joan Ganz Cooney had a vision of a televised pre-school educational program to "master the addictive qualities of television and do something good with them." Cooney's vision has since been realized through the Sesame Street Workshop in over 140 countries with countless children across the entire globe. Over 20 Sesame programs are currently crafted individually and created for the specific cultural identities of their target audiences. So is Sesame Street's promotion of cultural understanding and literacy an attempt to globalize shared values or is the programming another product of "Western" cultural imperialism? This research examines the motivations guiding Sesame Street's international programming, specifically comparing programs in Israel, Palestine, and Mexico. After briefly discussing the definition of cultural imperialism and then the political and social history of these three countries (1980s-present), this project compares Sesame Street's programming in each country. My research considers original primary sources and secondary scholarly journal articles to focus on the funding of the programs from specific governments and NGOs, as well as the social or political challenges the programs encountered. I focus on how the targeting of children through media intersects with processes of globalization that present both opportunities and challenges for local populations.

"Nature versus Nurture" for Spiral Galaxies in Different Environments - (Physics and Astronomy)

By: Logan Hess, Albert Unruh
Faculty mentor(s): Adriana Durbala

We explore the relative role of "nature versus nurture" (intrinsically versus environmentally driven influences) in shaping the morphology and evolution of galaxies. We perform a detailed photometric analysis of face-on spiral galaxies (SOa/Sa/Sab) found in different environments employing a Fortran code called BUDDA (BUlge/Disk Decomposition Analysis) and the IRAF astronomical software. We use green (g) and red (i) filter images from SDSS (Sloan Digital Sky Survey). The main components of a spiral galaxy (bulge, disk, bar) are modelled with appropriate mathematical functions. We present the scaling relations between parameters that describe different components of the galaxies. We compare the photometric properties in two samples of galaxies (isolated versus loose groups).

Numerical Modeling of Stars with Radiative Cores and Convective Envelopes - (Physics and Astronomy)

By: Thomas Mattimiro
Faculty mentor(s): David Tamres

We report outcomes of numerical modeling of chemically-homogeneous main sequence stars having a radiative core and a convective envelope. A fourth-order Runge-Kutta algorithm is used to solve the coupled differential equations describing the structure of, and the energy transport within, the stars. Separate solutions obtained for the radiative core and for the convective envelope are joined at the base of the convention zone using the technique described by Schwarzschild (1958). Trends in the stars' internal and external characteristics deduced from the modeling will be presented.

Transient Thermal Imaging of Quantum Cascade Lasers (QCLs) by Thermoreflectance Microscopy - (Physics and Astronomy)

By: Jacob Olufs
Faculty mentor(s): Maryam Farzaneh

Quantum Cascade Lasers (QCLs) are high power, mid-infrared semiconductor laser diodes with a broad range of applications in remote sensing, fiber optic communications and broadband spectroscopic analysis. It is known that excess heat affects the performance of a QCL, and its efficient operation and high output power depend strongly on improved thermal management and heat dissipation. Therefore, it is important to understand the temperature distribution and heat flow in QCLs in order to improve their design with regard to thermal management. In this presentation we discuss the time-dependent thermal response of a QCL to a heating pulse, and explore the dependence of this transient response to different pulse widths and amplitudes. In order to determine variations in temperature, we study thermal images obtained by thermoreflectance microscopy. This technique is based on measuring the relative changes in the reflectivity of the surface of QCL, which are directly proportional to changes in surface temperature.

These thermal maps yield valuable information about the spatial distribution of temperature over the laser facet and will be used to determine thermo-physical parameters of the laser structure. This work will be extended in future to include the study of thermal properties of monolithically integrated arrays of QCLs.

Simulating Fluid Flow Using Lattice Gas Cellular Automata - (Physics and Astronomy)

By: Eddy Doering
Faculty mentor(s): Brad Hinaus

Physics based modeling of a system of fluid like particles has been computationally programed for some time now. We use a Lattice Gas Cellular Automata (LGCA) to computationally calculate the flow of fluid particles through a tube. In LGCA discrete fluid particles flow through a series of nodes. When particles collide at a node, their final state is determined by a simple set of rules that conserve both momentum and energy. We repeatedly apply these collision rules to simulate the fluid flow patterns through and around various obstacles. We will compare our output to the know velocity profiles through a tube.

Beliefs About Technosalvation: A Potential Barrier to Climate-Change Mitigating Behavior - (Psychology)

By: Megan Patterson, Hugh Rumsey
Faculty mentor(s): Robert Nemeth

According to Gifford (2011), one obstacle that prevents individuals from making behavioral changes in relation to environmental issues is the belief in technosalvation, which can be defined as the belief that technological advances alone will be suitable to defend against impending societal problems such as climate change. We surveyed 163 undergraduate students enrolled in Introduction to Psychology at the University of Wisconsin-Stevens Point regarding beliefs about the environment, as well as use and attitudes of technology. Survey instruments included the Nature Relatedness Scale, New Ecological Paradigm Scale, Media and Technology Use and Attitude Scale, perceptions of technological necessities versus luxuries, as well as various demographic characteristics. These scales were analyzed to determine the best predictors of technosalvation beliefs. In general, a majority of survey respondents endorsed technosalvation beliefs. Additionally, respondents' beliefs in technosalvation were positively correlated with media and technology use.

Connections on Campus: Links With Functioning - (Psychology)

By: Kevin Mohawk, Jennifer Delikowski
Faculty mentor(s): Debbie Palmer

We examined how much support in handling emotional and academic problems Introduction to Psychology students at UWSP perceived they had from others on campus. We explored whether greater perceived support from campus members was linked to stronger personal identification with UWSP and higher academic self-efficacy and motivation. We also examined connections with gender, ethnicity, racial identity and

GPA at two points in the semester. Prior research studies indicated connections amongst these variables (Bandura, 2006; Honora, 2015; Matthews, Banerjee & Lauermann, 2015; Pintrich, Smith, Garcia, McKeachie, 1991; Voelkl, 1996); however, this research included only high school students (Nasir, Jones, & Mclaughlin, 2011). We predicted that traditionally underrepresented students, such as minority group members, would feel less personally connected with the UWSP campus in general, and with faculty and staff and classmates in particular compared to student members of the majority group. We also expected to see older students reporting greater levels of connection with campus in general and faculty and staff and classmates in particular in comparison with younger students. It was expected that younger female students would have lower levels of academic self-efficacy and motivation in comparison to their male classmates and with older female students.

Effects of Developmental Exposure to Bisphenol-S on Anxiety in Rats - (Psychology)

By: Tiffany Becker
Faculty mentor(s): Heather Molenda-Figueira

It has been suggested that developmental exposure to endocrine disruptors may play a role in the development of a diverse group of maladies. Little is currently known about the impact of Bisphenol-S (BPS), an endocrine disrupting chemical that has replaced BPA in plastics, on health or behavior. We investigated the impact of developmental BPS exposure on anxiety-like behaviors in rats, and whether sex differences in response to BPS treatment are present. Pregnant rats were exposed to BPS in drinking water or untreated water beginning on gestational day 12, at a BPS dose of approximately 15µg/kg/day. Subjects for behavioral tests were offspring of the treated mothers and totaled 10 rats/sex/water treatment group. Exposure to BPS through drinking water continued until 45 days of age. Beginning at 21 days of age (juvenile test), rats received one of 3 anxiety tests: the elevated plus maze (EPM), light-dark box (L-D Box) or open field test (OF). Rats received 1 type of test on alternate days until all 3 tests were completed. Each test was conducted for 5 minutes, and behavior was recorded using video cameras. Rats were again tested for anxiety beginning at 37 days (peripubertal test) and finally beginning at 60 days of age (adult test). We found that developmental exposure to BPS had no effect on levels of anxiety; however, all rats displayed higher levels of anxiety during the peripubertal test.

Exposure to and Utilization of Positive Psychology in the Professional Lives of Counseling Psychologists and Counseling Psychology Graduate Students - (Psychology)

By: Brittany Wierzba, Gabrielle VanGompel, Maire Przybylski, Lizbet Parks, X Purdy
Faculty mentor(s): Jeana Magyar-Moe

A hallmark of those in the counseling psychology profession is focusing upon the positive in psychology (Magyar-Moe & Lopez, 2008). A distinctive feature/unifying theme of the work of counseling psychologists is the focus on client strengths, assets, and potentialities regardless of the degree of psychopathology (APA, 1999; Gelso & Fretz, 2001; Savickas, 2003.) Review of the development of the counseling psychology

specialty confirms this enduring philosophy and commitment to helping individuals to discover, develop, and utilize personal and social resources on a regular basis (see Lopez et al., 2006). The current study was developed in order to further elucidate the role of positive psychology in the work being done by counseling psychologists and the training being received by counseling psychology graduate students. More specifically, three surveys were developed and disseminated to all counseling psychologists and counseling psychology graduate students who are members of the Society of Counseling Psychology of the American Psychological Association in order to gather data on how many members utilize positive psychology and the ways in which these professionals or future professionals apply positive psychology in their work.

People Do a Great Job Interpreting Written Sarcasm - (Psychology)

By: Montanna Zajac, Jemimah Vettrus
Faculty mentor(s): Craig Wendorf

The purpose of this study was to improve our understanding of how individuals perceive and respond to written sarcasm. Recent studies (Dress et al., 2008; Ivanko, Pexman, & Olinek, 2004) have shown that people often define and interpret sarcasm in different ways and that there are regional variations in the use and understanding of sarcasm. Whereas many studies (e.g., Woodland & Voyer, 2011) focus on the context and tone of voice used for verbal sarcasm, the role of context is likely even more important for written sarcasm (cf., Whalen, Pexman, & Gill, 2009). In our study, participants responded to written sarcastic scenarios. These scenarios included comments that are ambiguous and may be best interpreted by their written context. For example, one scenario described a situation where a student responded to a friend's attempted solution of a difficult problem by saying, "You're so smart." Scenarios were then manipulated to alter aspects of the context that were hypothesized to increase the likelihood of sarcasm use, such as the difficultly of the underlying problem. Participants then rated these scenarios using a series of Likert-type scales, each reflecting a specific component of sarcasm: humor, rudeness, negativity, and mockery. These responses were compared across the manipulated scenarios. Additionally, participants' responses were then correlated with demographic variables, such as political affiliation, gender, and age.

Surely You Are Not a Sarcastic Person - (Psychology)

By: Stephanie Stanton, Brittany Wierzba
Faculty mentor(s): Craig Wendorf

Sarcasm and irony are often confused, misunderstood, and misinterpreted in the minds of the general public. This can lead to problems when conducting research on sarcasm and irony, especially if people do not know what these terms mean and are asked to self-report on their sarcastic tendencies. Previous studies on sarcasm have examined peoples' self-reported sarcastic tendencies, but only by asking people to directly rate their own "sarcasm" (Dress et al., 2008; Ivanko, Pexman, & Olineck, 2004). Instead, our work created a two-part measure of participants' levels or sarcasm without using the word "sarcasm" in the items. The first portion asked participants to choose the most likely responses – from among a list of sarcastic and non-sarcastic comments – they would make in a series of common daily situations. The second portion used self-report scales to

determine participants' likelihood of using words that convey of opposite of their intent in order to be funny, dramatic, mocking, mean, or conveying dislike (all components of sarcasm). For the sake of establishing convergent validity, participants also completed Ivanko, Pexman, and Olinek's (2004) Sarcasm Self-Report Survey. Overall, responses were used to create a profile of sarcastic tendencies and were compared to Dress et al.'s (2008) regional findings.

Video Game Genre Experiences and Visual Ability - (Psychology)

By: Kana Ewing, Rachel Ackley, Rowan Pockat
Faculty mentor(s): Patrick Conley

Video games have become ever more ubiquitous in our society, with a presence in not just computers and consoles, but now phones, tablets, and even children's toys. In a previous study, we determined that the amount of video game experience and the age at which that experience was gained were predictors in a visual search task, with more and earlier experience leading to faster performance. In the current study, we have examined the role that video game genre plays in this relationship. A questionnaire was distributed asking participants to rate their amount of experience in thirteen different genres of video game, such as first person shooters, sports games, strategy games, and role playing games. Results demonstrated that experience playing faster-paced or more action-oriented genres of video games led to faster and more accurate performance in a visual reaction time task. Additionally, experience in a greater number of differing genres (that is, exposure to a higher number of different categories of video games) also led to better performance. These results suggest that type of video gaming experience matters as much as the amount of the experience. The data on what genres are being most played and the attitudes of players towards video gaming in general will also be presented.

A Study on Death Penalty Across Secular and Religious Governments - (Sociology and Social Work)

By: Jillian Behling
Faculty mentor(s): David Barry

How do religious governments and the retention of an institutionalized death penalty relate? According to the literature, a country that operates under a religious government should have stronger connections to the retention of the death penalty compared to countries that operate under secular governments. This study will challenge this hypothesis. To do so, content analysis of data derived from Amnesty International, the Association of Religion Data Archives, and other sources are administered. A preliminary analysis examines fifteen countries across five regions of the world. Using Wallerstein's world systems theory (WST) as a theoretical framework, these regions are categorized as core, semi-peripheral, or peripheral societies. This set up will allow for greater analysis of the government/death penalty relationship as further steps will be taken to examine additional variables. This initial phase will provide tentative results regarding the relationship between type of government (i.e., religious vs. secular) and position of death penalty, and discussion for further research.

An Examination of Unemployment Among Wisconsin Veterans Who Served in 2001 and Later - (Sociology and Social Work)

By: Molly Roberts
Faculty mentor(s): David Chunyu

My research examines the relationship between being a Wisconsin veteran who served later than 2001 and employment status through the use of the 2008-2012 American Community Survey 5-year PUMS data. The veterans who served in 2001 or later are predominantly Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) veterans. I compare the employment rates of these Wisconsin veterans to that of civilians and reveal the barriers these veterans face in readjusting to civilian employment. I also examine whether a veteran's gender and race have an effect on post-service employment outcomes in the civilian workplace. My literature review outlines the many barriers that returning veterans face in obtaining employment such as mental and physical illnesses, stereotypes held about veterans by civilian employers, substance abuse, identity issues and social role renegotiation. The variables I examine enable the reader to fully comprehend the current employment situation facing Wisconsin veterans that served in 2001 and later. My research concludes that Wisconsin veterans that served in 2001 and later are more likely to be unemployed than civilians. I also discover that Wisconsin female veterans that served in 2001 and later are more likely to be employed than their male counterparts. In addition, my research finds that African American veterans that served in 2001 and later from Wisconsin are more likely to be employed than their white counterparts.

Does the Stevens Point Community Think There Are Land Use Issues on Division Street and If So What Are Some Potential Solutions? - (Sociology and Social Work)

By: Joe Paoletti II, Dominque Swangstu, Justin Seis
Faculty mentor(s): Krishna Roka

This project is to assess and analyze the public's opinions on what should be done with the Division Street area in regards to its land use. Due to this stretch of multiply owned properties being so extensive, certain preparations are going to be made to ensure all students, individuals, families, and business owners all have an input on the proposed changes. We will be conducting a survey of different members in the community directly influenced to any changes to the landscape. An online survey will be given to all of the students here on campus in the form of an emailed survey. We will also be talking to all of those managers and owners of the businesses located within the project area. The survey will consist of at least 10 multiple-choice, true or false, and rating questions such as "On a scale of one to ten how satisfied are you with the current land use practices on the project area?" The answers to these questions can be used to more effectively plan for real world applications on the Division Street Project. We will also make three potential scenarios in the form of basic land use maps on ArcMap-GiS to better depict the options to the public.This presentation with be shown through a poster and will consist of the results we will be receiving after the surveys have been collected, along with the maps that have been created.

Environmental Narratives: The Influence and Correlation of Environmental Views and Values - (Sociology and Social Work)

By: Montanna Zajac
Faculty mentor(s): Krishna Roka

The objective of this research was to explore how narratives influence environmental values. We like stories, especially, that resonate our views and perspectives. This research used narratives as interactions that enable us to interpret and live in the world. In this study we specifically assessed if there was any correlation between environmental narratives people believe and their environmental values. Our hypothesis is that a strong relationship exists between the narrative people associate with and their environmental values. Since environmental narratives have a strong influence on how people perceive environmental issues and therefore, if we can modify the narratives people believe we can change their views on key environmental issues resulting in an unprecedented support to solve them.

Obesity, Healthcare, and Socioeconomic Status of Portage County Residents: Evidence from the Portage County LIFE Survey - (Sociology and Social Work)

By: Aimee Smolens
Faculty mentor(s): David Chunyu

This research uses data from the 2012 and the 2015 Portage County Local Indicators for Excellence (LIFE) Survey and studies the health status of Portage County residents and its association with socioeconomic status and access to healthcare services. By understanding the underlying mechanisms limiting access to healthcare, policy makers and local organizations can better accommodate community members faced with various social barriers. This research examines the following variables in the LIFE dataset: residents' BMI, education, income, location (zip code), and access to healthcare and health services in the Portage County of Wisconsin. Health services include: prescriber services, prescription drug services, dental services, and mental health services. The preliminary findings indicate a correlation between obesity (BMI over 30.0) and failure to access healthcare outlets in all aspects excluding mental health services. These results suggest that social forces such as stigma associated obesity may be preventing individuals from seeking required medical services. Further findings suggest a positive association between educational attainment and healthcare access up to college-level education. Level of income may be a contributing factor, as well. Location is shown to have a substantial impact on healthcare access. It appears the 54482 zip code has the most access to health services, which may be attributable to the higher income level this area has.

Racial Disparity in America - (Sociology and Social Work)

By: Amber Heil
Faculty mentor(s): David Chunyu

The purpose of this research is to illustrate the realness of the racial barrier that still exists in America today. Using data from the 2010 and the 2014 General Social Survey, this

study compares whites' and blacks' labor market outcomes such as work status and income when controlling for their educational attainment. This study also compares whites' and blacks' subjective characteristics such as their opinion of government spending to improve the conditions of Blacks and their opinion when it comes to improving their standard of living. The data strongly suggests racial disparity exists in America today. Blacks have higher unemployment and lower income than their white counterparts. In comparison, whites tend to think too much government money was being spent to improve the condition of Blacks. These results suggest that racism today takes a different form than in years past. The institutional racism that is embedded into society takes a more covert form and makes everything seem fair on the outside. By reading the facts that blacks do have higher unemployment and do make less than their equal white counterparts, a person can see the gap in America is real. In spite of this, Black respondents tend to be more optimistic when it comes to improving their standard of living than white respondents. Regardless of the opinion of some, Black lives do matter.

The Unequal Advantage that Health Plays in American Lives - (Sociology and Social Work)

By: Kayla Skaletski
Faculty mentor(s): David Chunyu

This research explores health status and its relationship to income, employment, and opinions on government services through the use of the 2014 General Social Survey (GSS) conducted in the United States. The literature review explains the positive relationship between income and health internationally. The review also gives light to how poor health can severely impact an individual's productive capabilities in school and the workplace, which often leads to lower employment rates, earlier retirement, and an increased societal impact. Self-rated health status is used to develop the three hypotheses that follow. Individuals with lower socioeconomic statuses have poorer health than individuals with higher socioeconomic statuses. Individuals with poor health are more likely to be unemployed than individuals with better health. Individuals with better health are less likely to value the need for government healthcare assistance than individuals with poor health. To better assess the relationships established in the hypotheses, control variables are used including age, political views, and sex. Overall, the research concludes that individuals with poor health are more likely to be unemployed, have a low socioeconomic status, and be in support of government healthcare assistance services than individuals with good or excellent health.

Spirituality in the Short Stories of Gabriel García Márquez - (World Languages and Literatures)

By: Jacqueline Connolly
Faculty mentor(s): Renee Craig-Odders

The works of Gabriel García Márquez, are full of mystical themes which he employs to explore humanity so as to comment on and critique its spiritual outlook. His works go beyond the genre of Magical Realism for which he is well known and where the fantastical cannot be explained by the real. While studying the short stories in the book *Doce cuentos peregrinos* and the short story *Un señor muy viejo con unas alas enormes,*

the reader can identify a recurrent underlying ideology manifested in three themes. The first theme is death and how the characters react when they come face to face with it. The second, related, theme is the characters' personal mysticism revealed through their questioning of what happens after death and thereby exposing their good and evil tendencies. He especially portrays ignorance as the reason for their choices, leading to inaction or lack of agency on their part. The third theme is criticism of the Catholic Church as an institution. As a catholic himself, García Márquez attacks the bureaucracy and lack of spirituality found in some of the church's members, therefore exposing the need to change so as to serve the faithful's spiritual needs better. These stories are but a small part in the vast array of works by a prolific Latin-American writer. In them one can observe an underlying ideology which is at once both critical and indicative of the importance of religion in his work.

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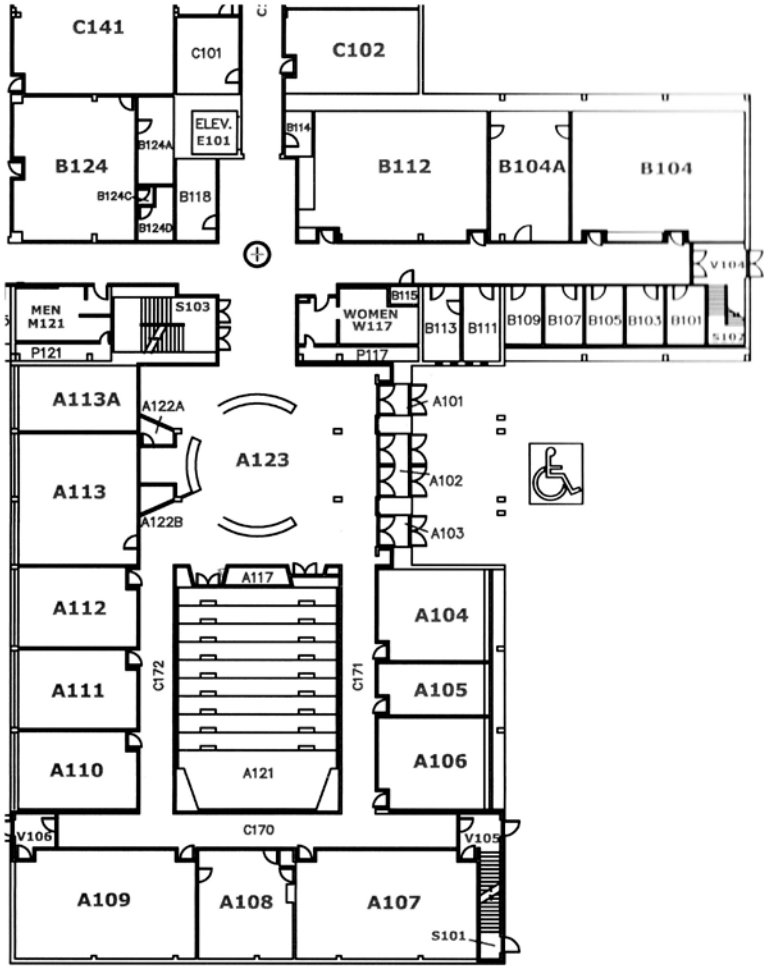

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