

**Seven Rivers Undergraduate Research Symposium
Abstract Booklet**

Viterbo University, La Crosse WI
November 12, 2010

Keynote Address:

Dr. Lee Alan Dugatkin

University of Louisville

Distinguished University Scholar and
Professor of Biology

Title

“Mr. Jefferson and the Giant Moose”

Location

Viterbo University
Fine Arts Center Main Theatre

Time

11am-12 noon

Oral Presentation

Room RC127

2:00PM

A Two Year Comparison of Various Farming Practices at the FSPA Villa in St. Joseph, WI

Kathryn Korthauer, Christopher Iremonger, Sr. Lucy Slinger,
Viterbo University

As issues regarding climate change, the environment, and sustainability continue to increase in importance, people have begun to examine their personal life practices and the impact those practices have on the environment. One group here in La Crosse, the Franciscan Sisters of Perpetual Adoration (FSPA), is among those who are looking to change their impact on the world environment. They have done this by changing personal habits, reviving their 1.5 acre organic garden in St. Joseph, WI in 2005, and by working to make a long-range land management plan for their land at St. Joseph Ridge, WI. This management plan includes a transition of farming practices from conventional to more sustainable practices for all tillable land. In preparation for such a transition, Viterbo University Interns have implemented monitoring techniques for land areas that are under different management practices. This presentation is an analysis of the soil tests performed over the summers of 2009 and 2010. It will not only look at differences between the years, but differences between the three farming practices (organic, conventional, and transitioning) presently in use on the tillable land.

2:20PM

Summer Dominance Interactions among *Carpodacus Purpureus* in Northern Minnesota

Jacqueline Anderson, Coe College Field Station, Grinnell College

This study reports the results of summer interactions among *Carpodacus purpureus*, commonly known as Purple Finches, at the Coe College Field Station in Northern Minnesota. From July 11th, 2010 through August 3rd, 2010, encounters resulting in displacement of the losing individual were recorded at a 6-space bird feeder that offered exclusively black oil sunflower seeds. Purple Finches are unusual since yearling male Purple Finches are indistinguishable from adult females (Bent, 1968). This differs even from *Carpodacus mexicanus*, commonly known as House Finches, who shares a similar range of habitat and has been observed at the same feeder as the Purple Finches. Of the 839 total cases observed, ignoring male and female differences, birds preferred to attack rather than to go to an empty space. Overall, attacking males won 77.7% of the time when a male was present, and attacking males won 0% of the time when a female was

present. However, attacking females won 84.6% of the time when a male was present, and attacking females won 41.6% of the time when a female was present. At that time of the year, Purple Finches appear to be aggressive choosing to attack another member of their species. Furthermore, the dominance found in female plumaged birds over the male plumaged birds confirms an earlier winter study where female plumaged Purple Finches won intraspecific displacement interactions with males (Shedd, 1990). This leads to the hypothesis that first year males with female plumage are taking advantage of female dominance in order to gain better access to resources. This advantage is particularly important for first year birds since access to resources in a particularly competitive environment, especially during wintering months, may otherwise limit the population.

2:40PM

**Development of a Protocol for Assessment of GFP Expression in
*Drosophila melanogaster***

Pajtshiab Moua, David Bauer, Viterbo University

The current study focused on developing and testing a protocol to quantify green fluorescent protein (GFP) expression in *Drosophila melanogaster*. Wild-type (WT) and mitochondria-tagged green fluorescent protein (MG) fruit flies were tested and analyzed for intensity expression of GFP by measuring the intensity of emittance from the eyes. A standardized lab protocol was developed for the use of a stereomicroscope, the ProgRes Capture Pro camera and software and the iSolution Lite software program to evaluate this expression. The pilot study results indicate a significant difference between MG and WT flies, with MG flies showing a greater intensity of GFP and a greater overall size of eyes compared to WT flies. These results support the validation of this protocol for future use in the lab to evaluate GFP expression in *Drosophila melanogaster*.

3:00PM

**Use of an Artificial Habitat by Racerunners
(*Aspidocelis sexlineata*)**

Michelle Gossen, St. Mary's University of Minnesota

The racerunner is one of the few lizard species that is found in Minnesota. It is considered a species of greatest conservation need, and it typically occurs in remnant patches of prairie habitat on southern or southwest-facing bluff slopes in the southeastern part of the state. However, a population of racerunners occurs along an elevated dike road at Prairie Island Park in Winona, Minnesota. An assessment of racerunner use of this habitat took place during the summer and early fall on warm days when racerunners were most likely to be active. Paired random 50-meter transects revealed that racerunners were found along a distance of about 3 kilometers on the southern side of the road and about 1 kilometer on the northern side. The mean number of racerunners per transect was significantly greater

on the southern side of the road. Paired measurements of substrate temperature revealed that the southern side of the road was significantly warmer than the northern side. However, the southern side consisted of open sandy habitat while the northern side was primarily rocky rubble, and it is possible that racerunners were easier to detect on the southern side. Racerunners were observed in transects that ranged from 2 meters to 13 meters from the edge of the road, and mean distances from the southern edge (7.23 meters) and the northern edge (5.50 meters) were not significantly different. This study has shown that the dike road provides a substantial amount of habitat that is used by racerunners. A further goal is to use the transect data to estimate the racerunner population size.

3:20PM

**The Role of Past Experience on Subsequent Survival in the
guppy *Poecilia reticulata***

Brenda Stackhouse, Michael Alfieri, Viterbo University

The restocking of fish populations with hatchery-reared fish is an important aspect of fish conservation. Hatchery-reared fish are raised in conditions that often do not simulate the natural habitat and without predators that the fish will likely encounter in the wild. Fish that have past experience with predators may be better able predation. Many fish require experience with a predator to recognize specific predator visual cues such as movement or color patterns and avoid them. Additionally, some fish release a chemical alarm cue when injured that other fish in the shoal recognize as a predator and avoid it. Although recognition of these cues may be innate, experience with cues is often required to associate the cue with a particular predator or threat and refine anti-predator behavior. We hypothesized that guppies that had past experience with a predator would have higher survival rates when introduced to a predator. The experimental protocol consisted of two treatments: one that subjected fish to a visual predator plus chemical alarm cue and a second that subjected fish to a visual and chemical control cue. The results showed that guppies that have experience with visual and chemical alarm cues survived more frequently than guppies that had no experience with these cues. It may be possible for this research to be implemented into the process of rearing fish in hatcheries to increase the success of restocking fish populations.

3:40PM

**Tick-borne Pathogens in Winona County: *Borrelia burdgdorferi*
and *Anaplasma phagocytophilum* in *Ixodes scapularis***

Lukas Wallerich, Jeanne Minnerath,
St. Mary's University of Minnesota

Tick-borne pathogens are capable of infecting humans with a number of harmful diseases, such as Lyme disease from *Borrelia burgdorferi* and Anaplasmosis from *Anaplasma phagocytophilum*. *Ixodes scapularis*, commonly known as the deer tick, is a well-established tick species within Winona County that is known to be a competent vector for the aforementioned bacterial pathogens. The purpose of this study was to collect deer ticks from various locations in Winona County and assess the prevalence of the tick-borne pathogens *B. burgdorferi* and *A. phagocytophilum*. Deer ticks were collected from five separate locations in Winona County (approximately 100 ticks per site). DNA was extracted and analyzed for the presence of either pathogen using real-time polymerase chain reaction (rtPCR). Results indicated that, on average, 50% of the ticks were infected with *B. burgdorferi*, while 16% of the ticks were infected with *A. phagocytophilum*. These results are consistent with data collected from other regions within southeast Minnesota. Interestingly, 10% of the ticks were co-infected with both pathogens. This value was significantly higher than that observed in previous studies (2% co-infection). Surveillance studies, such as the one described here, are important to insure that the public is aware of the prevalence of these tick-borne pathogens.

Oral Presentation

Room RC130

2:00PM

Mathematical Modeling of Brownian Motion

Aaron Schaitel, Viterbo University

Using computer programming, we construct a mathematical model of particles undergoing Brownian motion in one dimension, especially in regards to the diffusion equation. First, we begin with the simple case of measuring the probability of a single particle. Second, we look at modeling a number of particles each undergoing Brownian motion in one dimension. Third, we consider fixed boundary conditions put upon the area in which the particles are undergoing Brownian motion. Based on assumptions we will look for any sort of patterns that occur within our model. Lastly, we will look at Brownian motion in two dimensions whilst looking for patterns between one-dimensional analysis and two-dimensional analysis.

2:20PM

Deformations of Associative Algebras

Josh Frinak, Austin Ott, Michael Penkava
University of Wisconsin-Eau Claire,

The fundamental theorem of finite dimensional algebras gives a decomposition of an associative algebra as an extension of a semisimple algebra by a nilpotent algebra. We have been studying extensions of infinity algebras, and constructing the corresponding moduli spaces. It turns out that most infinity algebras of a fixed degree are not extensions, unlike the associative algebra case.

2:40PM

The Future of the United States Postal Service

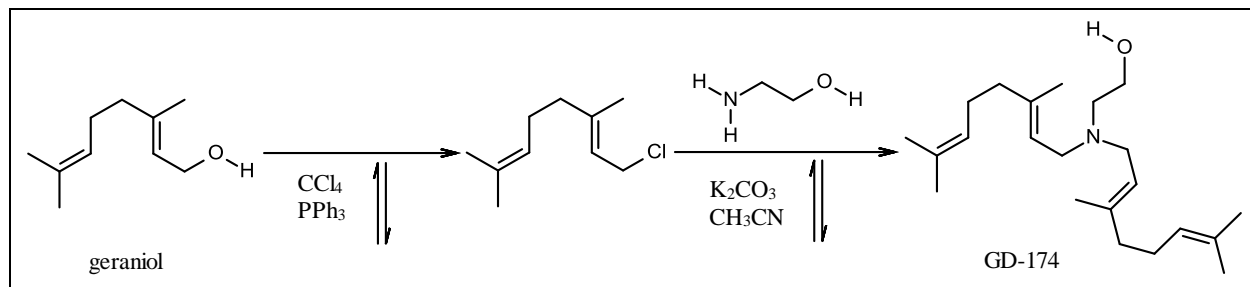
Adam Alexander, Amanda Hassani, Austin Mahlum,
Viterbo University

The United States Postal Service has funded itself for the last three decades, but its ability to continue to do so is uncertain. This is because 1) the use of first-class mail, the USPS's single most profitable product, is rapidly declining 2) the USPS's system of employee payment developed and solidified during years when large amounts of mailed-advertisement revenue made the USPS highly profitable, and 3) the USPS exited the large-volume shipping market in the 1950's in order to continue providing universal service at universal prices, and is not well prepared to re-enter this market. Our research project was the mathematical modeling of the USPS's profits into the foreseeable future. We made complex models of not only expected profits based on the continuation of the USPS's current business model, but also profits based on realistic cost-saving strategies the USPS might adopt in order to remain solvent, such as eliminating Saturday delivery. Our model pulls together information from various sources such as the Bureau of Labor Statistics, the USPS's past records, and various documents detailing past and future business strategies. Finally, we speculate about the actions that should be taken and the actions that are likely to be taken based on our model.

3:00PM

The Synthesis of GD-174, A Selective Carp Toxicant

Jared Scherr, Rhianna Nichols, Tammy Clark, Viterbo University,
Terry Hubert, Mark Gaikowski, Upper Midwest Environmental
Sciences Center



Common carp (*Cyprinus carpio*) have produced damaging consequences for the past several decades in the United States. Currently, the fish pose a major threat to the ecosystems of the Great Lakes. GD-174 has been tested as a selective carp toxicant by Marking in the 1970s. However, ineffectiveness in natural pond settings has halted development. New efforts are underway to better understand its activity and produce more effective analogs. A scalable 2-step synthesis of GD-174 has been developed and has been used to make 18.022g. This will be utilized for new toxicity studies against carp at the Upper Midwest Environmental Sciences Center in La Crosse, WI.

3:20PM

The Effects of YdfM on Iron Homeostasis in *Bacillus subtilis*

Carlson Thwing, Scott Gabriel, Viterbo University

Iron is an element that is crucial for our bodies to function, however it is also toxic in high concentration. In order to prevent a dangerous build up of iron in the cytosol, bacteria possess several systems which strictly control influx and efflux of iron into and out of the cell. Up to recently it was thought that only influx of iron was critical to control as excess iron could be stored in ferritin proteins. In the bacteria *Escherichia coli*, our understanding of iron homeostasis has changed with the characterization of the first *E. coli* iron efflux protein YiiP. When a comparative analysis of the *Bacillus subtilis* genome was performed using the Basic Local Alignment Search Tool (BLAST) and the YiiP protein sequence, YdfM was identified as a potential homologue sharing 22% identity and 47% similar. To test whether this potential homologue has functional significance in iron efflux, ydfm was disrupted with a kanamycin antibiotic resistance cassette. Isolated ydfm mutants and WT colonies were grown in a range of increasing FeCl₃ concentrations and the fitness of the two strains were compared by growth curves. Results suggest that a ydfm disruption actually increases the strains ability to grow through FeCl₃ stress. These results are contrary to our original hypothesis of YdfM acting as an efflux protein and instead suggest a possible role in iron uptake in *B. subtilis*.

3:40PM

Pathogenicity and the Sub-Cellular Localization of *Ralstonia Solanacearum* Effector Proteins

Michael Einstein, Raka Mitra, Carleton College

Ralstonia solanacearum, a gram negative bacterium, is a root-invading plant pathogen and the causal agent of bacterial wilt disease. *R. solanacearum* infects a wide range of plants including many economically important crop plants such as tomato and potato, causing an estimated yearly one billion dollars of crop loss for potato farmers alone. *R. solanacearum* colonizes plants through the roots and inhibits water and nutrient flow, which eventually causes plant death. In order to colonize plants, *Ralstonia* employs a type three secretion system, which punctures the cell wall and translocates bacterial effector proteins into the cytoplasm of the plant cell. Currently, the exact function of these effector proteins is unknown, but they are known to play an integral role in pathogenicity. In order to ascertain the specific roles of effector proteins in disease pathogenesis, the Mitra lab is investigating the sub-cellular localization of effector proteins using GFP microscopy. To do this we created GFP::effector fusion proteins using Gateway cloning and transformed *Agrobacterium rhizogenes* with these constructs. *Medicago truncatula* roots were inoculated with the transformed *A. Rhizogenes* and localization of the fusion proteins were determined, in vivo, by GFP microscopy.

Oral Presentation
Room RC201

2:00PM

Origins of North American populations of the invasive faucet snail, *Bithynia tentaculata*

Levi Hartman, Kathryn Perez, University of Wisconsin-La Crosse

Since the introduction of the faucet snail, *Bithynia tentaculata*, into the Upper Mississippi River (UMR) in 2002, there have been yearly die-offs of 15 species of waterfowl. *B. tentaculata* completes the life cycle of several invasive parasitic trematodes, including *Cyathocotyle bushiensis* and *Sphaeridiotrema globulus*, causing the waterfowl deaths. The objectives of this project are to determine the origin and spread of invasive *B. tentaculata* populations in the U.S. which will be used to implement better methods of prevention and monitoring of colonization routes. Since 16s mtDNA and COX-1 sequences show little to no variation between U.S. *B. tentaculata* populations, microsatellite analysis is used to more accurately show variation. Seventeen microsatellite loci (tandem base repeats) from *B. tentaculata* were characterized, which provide more relevant data than mitochondrial DNA sequences due to the high polymorphism rate associated with the non-coding

microsatellite regions. DNA was extracted from raw tissue by a CTAB/phenol chloroform digest. The extracted DNA was amplified in a 6-FAM labeled, fluorescent primer microsatellite PCR. The microsatellite PCR product was then analyzed with fluorescence fragment analysis with a maximum expected band of 404 bp. Alleles were present in Hungarian samples that were not present in U.S. samples, and vice versa. The Hungarian Danube River basin, currently our only European samples, is likely not the origin of the U.S. populations of *B. tentaculata*. Further sampling of the native distribution will be done to further narrow down the location(s) of origin for U.S. populations of *B. tentaculata*.

2:20PM

Effects of past experience on predator chemical cue avoidance in the guppy (*Poecilia reticulata*)

Sara Gilman, Michael Alfieri, Viterbo University

Guppies (*Poecilia reticulata*) can sense chemical cues given off by predators, which allows them to initiate proper antipredator behavior and gives them a better chance at surviving. This ability is not necessarily innate and because of this, many fish that are raised in hatcheries are highly susceptible to excessive predation once released into the wild. An effective method to prepare fish that are raised in captivity could increase the numbers that survive once they are used to stock lakes and rivers. In this study, guppies were trained by being exposed to one of three treatments, being regular water, water containing chemical cue that was taken from a predator aquarium, and both chemical cue water as well as the visual of a predator eating a guppy. After training, each guppy was tested separately in a y-maze apparatus to determine their preference between water with a chemical cue and water without a chemical cue. General avoidance of the chemical cue was seen in all treatments, but guppies that were trained with both the chemical cue and the predator visual showed the greatest avoidance. If hatchery-raised fish were exposed to such a treatment, then perhaps their likelihood of survival would be greater upon being released.

2:40PM

A Comparison of Soil Biota in Restored Prairie Plots and Agricultural Farmland

Jacqui Kasick, Bruno Borsari, Winona State University

A diverse community of organisms inhabits soil and contributes to the fertility and quality of the soil. The purpose of this study consisted in measuring organism distribution, species richness, and diversity within soil samples from plots within the same farm and an adjacent natural prairie that hosted different types of plant communities. Four plots of restored marginal farmland were considered: a Department of Natural Resources (DNR) restored prairie plot with grass and forbs, a restored prairie plot of grass only, a restored prairie

plot with grass and forbs, and agricultural land that had been planted with corn. While typical prairies undergo limited disturbance, the restored prairie plots that were considered at the farm have had their biomass harvested for the last three years. The hypothesis that soil biodiversity increased when agricultural land is restored to natural prairie land was tested. Identical soil samples were taken at 20 m intervals, from the four land plots along a 100m transect that was oriented north-south. The soil samples were placed for 48 hours in a Berlese apparatus and the micro- invertebrates were collected, and later classified. The data was analyzed through the goodness of fit test $\chi^2 = 80.715$ (DF value $n=3$) chi-square score, $p < \alpha 0.05$. Shannon's index was used to measure the species diversity of the four land plots. The Shannon's index value for the DNR land was the largest ($H' = 0.84033$), showing the DNR restored land had the greatest biodiversity. The results support the hypothesis that the DNR land had the greatest biodiversity and species richness (mean 26.0), and the agricultural land had significantly less biodiversity ($H' = 0.67756$) and species richness (mean 6.83). The H' value for the restored prairie plot with only grasses ($H' = 0.71141$) was higher than both the agricultural land ($H' = 0.67756$) and the restored prairie with mixed grasses and forbs ($H' = 0.6680$), which was lower than the agricultural land. This data raises the question of whether or not the once, sometimes twice yearly biomass harvests have an effect upon the below-ground biodiversity.

3:00PM

Renewable Energy from Prairies: Pellet Production and Land Management Approaches

Daniel J Sans Crainte, Winona State University

The use of marginal farmland for prairie reconstruction rather than prime agricultural land may have potential to produce renewable energy as well as offer many ecological benefits to the farm system. The purpose of this study was to measure biomass yields from reconstructed prairie patches of mixed perennial grasses on a farm in southeastern Minnesota. These yields were compared to the same obtained from corn (*Zea mays*) during a timeframe of three growing seasons (2008-2010). Harvest took place every year between October and November. The biomass was roto-baled, left in the field for one week to dehydrate and then weighed with Intercomp wheel load scales. A One-way ANOVA analysis was employed to determine whether there was a significant difference between the last three years of biomass yields ($F(3,20) = 12.43$, $p < 0.01$) from the restored prairie and corn. Then a Tukey HSD was performed to show which years' biomass yields were different. Mixed Grasses have yielded comparably to corn in 2009; however 2008 and 2010 data showed corn yields were higher than mixed grasses. The low yields of mixed grasses in 2010 may be explained by the fact that continuous harvesting from restored prairies may have depleted the soil fertility. This knowledge possesses implications for regenerating fertility when prairies are reconstructed for pellet production from biomass.

3:20PM

Inhibition of Cattail Germination by Interspecific and Intraspecific Cattail Root Extracts

Lauren Beal, Bradley Cook, Minnesota State University-Mankato

Three species of cattails are common in the upper Midwestern USA. *Typha latifolia* is native to North America, *T. angustifolia* is an exotic species introduced from Eurasia, and *T. x glauca* is a hybrid between *T. latifolia* and *T. angustifolia*. *Typha angustifolia* and *T. x glauca* are invasive species that are reducing the biological diversity of many wetlands and have become difficult to manage. Individuals of each species produce ~250,000 seeds each year but preliminary genetic profiles of cattail communities suggest that each species primarily reproduces clonally through rhizomes. Therefore, seeds are not effective locally and invasive clonal reproduction suggests that a strong competitive mechanism is at work. Some research suggests that *T. latifolia* releases auto-toxic root exudates that inhibit germination of conspecifics and *T. angustifolia* has a similar allelopathic effect on native heterospecifics. Here we tested the effects of cattail root extracts on cattail germination for all interspecific and intraspecific combinations and using deionized water as a control in bioassays. From field observations *T. latifolia* has the fewest conspecific neighbors and *T. x glauca* has the fewest heterospecific neighbors. Our results among all 16 pair-wise species by extract combinations show that there were no apparent allelopathic effects. However, there were 4 facilitative effects. The germination of *T. latifolia* seeds was facilitated by root extracts from all three species and *T. angustifolia* root extracts facilitated the germination of *T. x glauca* seeds.

3:40PM

The Effect of Biochar on the Growth of Roots of Selected Agronomic Plant Species

Brent Maphis, Winona State University

Atmospheric carbon dioxide has been rising exponentially since the industrial revolution. In order to reduce the drastic consequences of global warming scientists will need to employ techniques and technologies to either reduce emissions, or sequester carbon dioxide and other greenhouse gases out of the atmosphere. Biochar could serve as an important resource when applied to agricultural soils, along with other benefits to foster life in soil systems. The purpose of this study was to monitor the roots growth of pea and wheat plants when biochar was mixed with vermiculite, at different concentrations, in rhizotrones where these seedlings were grown. 35 rhizotrones were employed in four trials conducted between the spring and fall semester of 2010. The biochar placed in 3cm bands at a depth of 0cm, 5cm, and 10cm, along the rhizotrone. The seeds were germinated in water baths for seven days and then transplanted into the rhizotrones. The seedlings were grown until the leading root would have reached the bottom of the rhizotrone. At this point seedling growth was interrupted, and the numbers of roots per length of the

substrate profile were measured. The data were analyzed with JMP software and ANOVA tests were employed. The results showed that both pea and wheat seedlings enhanced root development when growing in soil with 10% biochar. More trials are needed, however, to better understand the optimal percentage of biochar, which most enhances root growth.

Oral Presentation **Room FA204a**

2:00PM

Can We be Friends? Social Distance Between Black and White Undergraduate Females

Breanna Alston, University of St. Thomas

Many scholars acknowledge the social distance between black and white women given the historical legacy of racism and segregation in the United States. To address a paucity of research on the social distance between Black and White women in higher education, this pilot study examines the quality of relationships between Black and White undergraduate women at a medium-sized university in the upper midwestern United States. Structured and semi-structured interviews explore questions about Black and White women's social relationships. For example, what is the level of social distance between Black and White women? How does race affect the relationships between Black and White women? I expect the results from a replication of the Bogardus social distance scale to reveal high levels of social distance between Black and White female students on campus. That is, Black and White women will express hesitation about interacting with one another outside of the everyday encounters they have while on campus. Further, I expect the qualitative analysis to confirm that both historical and socio-cultural factors contribute to the infrequency of intimate relationships between Black and White female college students.

2:20PM

Assessing Social Networks at the Entrepreneurial Stage

Sarah Zimmerman, University of St. Thomas

This research paper discusses and reviews the findings gathered through one-on-one interviews for a non-profit organization in the Minneapolis-St. Paul area. The non-profit organization plans on expanding their organization. The main focus of this research is to determine inter-organizational social networks. Currently the main networking of this organization is limited within the religious and social welfare networks. I found that the organization has limited networks with government and business organizations. Government and business networks could help the organization expand in the upcoming

years. These findings are placed in the context of Richard Draft's work on organizational change.

2:40PM

Rural Chinese Elderly: Demographic Characteristics and Activities of Daily Living

Trisha Turner, Jianjun Ji, University of Wisconsin-Eau Claire

Based on a national elderly survey data in China, this paper presents the demographic characteristics of the Chinese rural elderly in terms of age, gender, and marital status and examines the restrictions on activities of daily living (ADL) in terms of eating, sleeping, dressing, toileting, and bathing. The paper tests the hypothesis that the elderly activities of daily living are associated with their demographic characteristics. By applying the Chi-Square significance test, the results show largely support to the underlying assumptions. Policy implications are discussed.

3:00PM

Links to Psychological Wellbeing of the Urban Chinese Elderly

Justine Cornelius, Kathryn Meinholz, Jianjun Ji
University of Wisconsin-Eau Claire

Using the 1992 China National Rural and Urban Elderly Survey data, this project examines the demographic and socioeconomic factors that contribute to the psychological wellbeing of the urban Chinese elderly. It is hypothesized that demographic characteristics of gender and fertility of the urban Chinese elderly have impact on their psychological wellbeing of health, loneliness, family relationships and life satisfaction. It is also hypothesized that socioeconomic statuses of family income and social support of the urban Chinese elderly have impact on their psychological wellbeing. Statistical methods of Chi-square significance test is utilized for this analysis. The findings largely support the hypotheses.

3:20PM

Brian Loeffler, Viterbo University

3:40PM
Poetry Creative Writing Process
Raisa Benusa, Viterbo University

This presentation will concentrate on the creative writing process of poetry. This will be explored by examining three poems and the processes that were taken in writing each one. Each poem has a different process and each of these will be demonstrated in the presentation. The main focus of this presentation is the draft process that was taken while writing the poems.

Oral Presentation
Room FA204b

2:00PM
Teacher Work Sample - Pumpkins and Literacy
Michelle Fellenz, Viterbo University

My Teacher Work Sample focuses on a creative way to teach literacy components to young children using pumpkins as a topic. I composed my Teacher Work Sample using four lessons as the main focus for literacy: shared reading, spelling, writing, and phonemic awareness. The lessons are designed so that the students experience a guided release of responsibility. First the lesson is modeled as a whole class, then the students brainstorm ideas, return to work with a partner or independently, and then brought back as a large group to share. These lessons also are designed to meet the interest of the students, and that is achieved through integration with in other aspects of the curriculum. The lessons have accommodations to meet both the first and second grade students as well as the needs of all the students in the class. I also used several different assessment tools to best fit each lesson.

2:20PM
Teacher Work Sample - Ice Cream
Amanda Bernett, Viterbo University

I have created a teacher work sample that has been based off of my reasearch of the students, and the practices I have learned about in my undergraduate courses at Viterbo. I have implemented these things into my unit about Ice Cream. I will specifically be focusing on one lesson about how ice cream is made. I will discuss what went into that lesson, and how I adjusted it to fit my class and their needs based on my research of them. The lesson is a felt board story, and assessment of the preschool students being able to retell the process of how ice cream is made.

2:40PM

**Teacher Work Sample: Increasing Sight Words
Through Word Families**

Kelcey Evers, Viterbo University

In the spring of 2010, I observed and helped in a kindergarten classroom at Hamilton Elementary where I taught the students about word families to increase their sight words. This class had a very wide range in the background knowledge and exposure to books. Throughout each year, the kindergarten students in the La Crosse School District are assessed to see what sight words they know. Therefore, I planned a unit to help the students have more time and opportunities to see and work with these words so that they could become better readers. During my lessons, I assessed the students' learning through individual and small group activities and games.

3:00PM

Teacher Work Sample: Splendid Words

Elisabeth Grams, Ali Thomas, Viterbo University

As a collaborative effort, we will give a joint presentation on our teacher work sample created for EDUC 319, Teaching of Literacy. The teacher work sample is a collection of data, including contextual factors, objectives, and assessments that provided a structure to the creation of our lesson plans which were taught to the students of a second grade class at Hamilton Elementary. Through the gathering of both quantitative and qualitative data and through the teaching of these lessons, we were able to reflect on our findings and develop an answer to our research question- did our students learn?

3:20PM

Teaching Poetry in 6th Grade: A Teacher Work Sample

Catrina Mayer, Viterbo University

"Teaching Poetry in 6th Grade: A Teacher Work Sample" is a presentation that will thoroughly explain what a teacher work sample (TWS) is and the process student teachers undergo to complete the TWS. A school district's contextual factors, knowledge of students, lesson plans, and lesson accommodations are all factors included in the TWS, as well as teaching strategies, assessment examples, and an analysis and reflection from the teacher. The three main questions that will be addressed and answered during this presentation are: what is the purpose of the TWS, how do teachers engage "all-student" learning, and how does the teacher know if learning has taken place? Examples from a 6th grade poetry unit, developed by Catrina Mayer, will supplement the explanation of the TWS.

3:40PM

The Process of Art Making for Middle School

Molly Sprain, Viterbo University

This presentation will focus on the process involved in making art at the middle school level. The unit plan that will be discussed centers on the thinking process and problem solving involved in the beginning stages of a project. The contextual factors of the class for which this unit was designed are an essential component in developing this unit. This presentation will address how the contextual factors affect lesson development and teaching.

Oral Presentation

Room FA219

2:00PM

Misunderstandings of the Family and Reasons to Avoid Them

Adam Alexander, Viterbo University

This presentation is the product of my researched senior thesis as an undergraduate student in the philosophy department. My project was to see if interdisciplinary research between psychology, sociology, and philosophy could be used to say something useful about the way people tend to understand the family. With sociological & psychological research as well as philosophical argument, I show how many understandings of the family classified under one of two archetypal understandings. I then extract assumptions about ontology, epistemology, and moral education from these understandings of the family. I show that upon rigorous examination, these assumptions are not only false, but also pose a danger to the future of our society's psychology and morality. To explain how understandings of the family based on false assumptions have come to exist, I use the Hegelian dialectical method, revealing the way that tension between the two understandings pushes them apart—away from both the truth and the utility of a position somewhere in the middle.

2:20PM

Highlighting Addiction:

Using Brassai's Light to Focus on Alcoholism

Katelyn Rubenzer, Viterbo University

My undergraduate research project will consist of one short story. Throughout this project, I explore the theme of addiction, while using research to properly display characteristics of what an addict is. I will use the model of realistic fiction to help guide my production of this

piece, as well as the works of William S. Burroughs, Brassai, Malcolm Lowry, and Lorrie Moore. All of these works intertwine chaos and realism, while also offering contrasting viewpoints of light and dark. When incorporating these works, I will be able to create a realistic portrait of what addiction is and the effect addiction has on one's life. My interest began in high school when I studied the French photographer, Brassai. He is one of the first artists to look at the lower class in France. His photographs are famous for using light to highlight France's outcasts, while keeping the higher class in the dark. After my Brassai exposure, I began looking for other artists who highlighted those that others often shied away from. It was in this exploration I discovered the works of Allen Ginsberg, John Berendt, Annie Proulx, Lorrie Moore, Malcolm Lowry, and William S. Burroughs. Musicians such as Bob Dylan, Regina Spektor, Fiona Apple, Kate Nash, and many others also inspired me with lyrics that criticized the ruling class, questioned conformity, and pushed the limits of acceptability. I wanted to start looking closely at the outcasts of society and use Brassai's model of shifting light to draw attention to the reasons why characters became addicts, instead of shun them for being addicts. I also developed an interest in the effects addiction on the addict's life, as well as the relationships of the loved ones with the addict. For that reason, my short story revolves around the theme of addiction, but not necessarily the addicts themselves.

2:40PM

Portrayal of Insane Asylums in the Media: Accurate or Not?

Katherine Fleck, Ashley Watson,
University of St. Thomas

The purpose of this study is to investigate the portrayal of insane asylums in motion pictures throughout 1900-2000. Seven popular movies were viewed and analyzed based on recurring themes of architectural styles, treatment of patients, and portrayal of institution staff. These characteristics were observed qualitatively. An in-depth archival research project focused on insane asylums from 1900- 2000. Research was conducted on actual asylums using articles and various other documents from "PscyhInfo". Researchers actively watched and took detailed observations of seven popular motion pictures based on life in insane asylums. These movies included: "One Flew Over the Cuckoo's Nest", "Return to Oz", "The Jacket", "Gothika", "Girl, Interrupted", "Shutter Island", and "The Asylum". Notes were compared and studied to find recurring themes. Future results are expected to show over-exaggeration of hospitableness of insane asylums and the negative treatment of patients and staff. Researchers are expecting to see themes of very hospital like institutions and sterile environments. Also, researchers expect to see cruel treatment of patients and a theme of evil personalities of staff in the motion pictures. It is predicted that it can be concluded that motion picture portrayal of insane asylums is inaccurate and overly dramatized. This is believed to be a factor of stigmatization of being mentally ill in American society. Also the stigmatization can be applied to the institutions that the mentally ill seek out for treatment and the treatment process in general.

3:00PM

Children and the Environment: New Reasons to Protect the Environment

Jayme Steinhoff, Viterbo University

As the Green Movement continues to grow in our current culture, we are finding more reasons to protect the environment. I believe one of the most crucial reasons for environmental stewardship is for the children. Some of society has been provided with the privilege in regards to their relationship with nature as a child; some of us can look back at our childhood and reflect on our memory place and the playgrounds we created through nature and our imagination. However, some of us have forgotten how important it is to learn and grow with nature. As education has shifted, children are spending more time learning how to use technology and focusing on deforestation and exploitation of other ecosystems instead of walking out into our own Wisconsin woods and experiencing nature through all senses. Technology has also provided other ways of play time that involve multimedia instead of the traditional outdoor play we use to see in children. Though there may seem to be logical reasons as to why children should not play outdoors such as fear of abduction or children causing possible negative environmental impacts, many people are starting to agree that the benefits of children in the environment exceed the costs. We will take a look at Richard Louv's Theory of Nature-Deficit Disorder along with what others are researching in regards to the psychological and physiological affects on children due to lack of environmental exposure. We will explore ideas on why children are not being exposed as they once were and what we can do to help as guardians of our future generation of children -- the future stewards of the Earth.

3:20PM

Bike Helmet Use: A Study of Risk taking Among Elementary and College Students

Ingrid Vatsaas, Karie Wallace
University of Wisconsin-Eau Claire

Risk taking is something that every parent and every educator fears as young children grow up and meet the world head on, preferably not literally. Previous studies concerning risk taking suggest that adolescents take more risks than younger children. This study investigated the correlation between age and risk taking among college students and elementary school students. We focused on the use of bicycle helmets. This illustrates the risk taking behavior of the college student age group over that of the elementary age group. The study indicates that the college students take far more risks than elementary school age children do. About 60% of elementary school students wore helmets, compared to just over 2% of college students, therefore we conclude college students will take far more risks than younger children.

3:40PM

Gene Expression in Several Varieties of Alfalfa (*Medicago Sativa*) Under Phosphorus Stress

Megan Loftsgaarden, Glenna Temple, Viterbo University;
Stephen Temple, Forage Genetics International

Phosphorus is the second most limiting nutrient for plant growth and is essential for healthy root growth and development in legumes such as alfalfa (*Medicago sativa*). Unfortunately, 40% of the world's arable land is phosphorus deficient, and it is estimated that the global supply of rock phosphates, primarily used as crop fertilizer, may be depleted in the next 60-90 years. Plants have two broad strategies to combat nutrient deficiencies: enhanced nutrient uptake and conservation of use. Several genes for these responses are involved in major metabolic pathways, including: glycolysis, photosynthesis and the citric acid cycle. The focus of this study was to characterize the expression patterns of genes in phosphorus deficient conditions in four commercial varieties of alfalfa, using genes previously found responsive to phosphorus stress, and studied in *Arabidopsis thaliana* and *Medicago truncatula*. Alfalfa is of significant agricultural importance throughout the United States. The objective of this study was to characterize the effects of phosphorus starvation on genes involved in phosphate transport in the roots, phosphorylation, and phosphate synthesis in four commercial alfalfa varieties bred for distinct regions of the country. Specifically, alfalfa varieties were grown in phosphorus deficient conditions for fourteen days, and then plant response was characterized by statistical analysis of dry root and foliate weight, RNA yield in root and leaf tissue, and gene expression via reverse-transcriptase PCR and gel electrophoresis. The results of this study showed little change in genetic expression across varieties under phosphorus starvation. A newly characterized gene in the literature, *dxs2* showed unexpected expression in the root gene expression analysis. Further target genes and strategies for future studies are discussed.

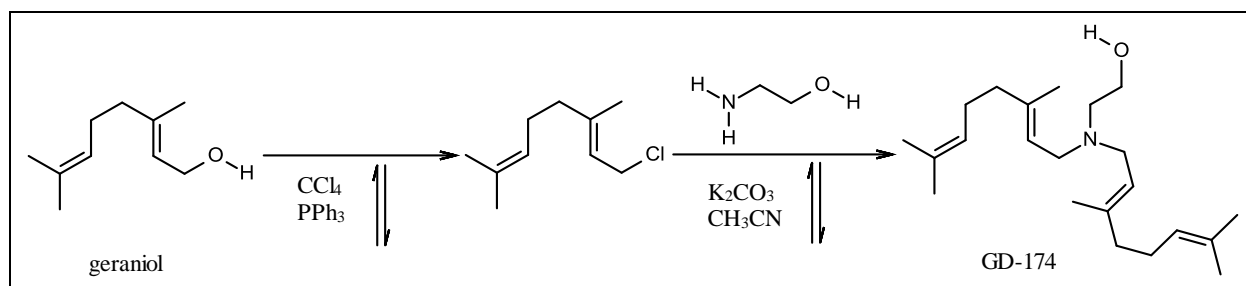
POSTER PRESENTATIONS

Poster 1

Efforts to Develop Potential Selective Agents for the Control of Common Carp (*Cyprinus carpio*) Through Large-Scale Synthesis of GD-174 and Analog Design

Rhianna Nichols, Tammy Clark, Viterbo University

Terry Hubert, Mark Gaikowski, Upper Midwest Environmental Sciences Center



Common carp (*Cyprinus carpio*) were introduced to American catfish farms in the 1960s to eliminate algae and other undesirable aquatic life. Since then, overpopulation of carp in many waterways throughout the U.S. has occurred. Unselective means of killing carp have been implemented, but due to urgency of controlling carp populations, a selective carp toxicant is desired. The synthesis of GD-174 was accomplished in two steps through commercially available geraniol. The synthesis was scaled up to provide 18 g which is being formulated as the HCl salt for testing at the Upper Midwest Environmental Science Center in La Crosse, Wisconsin.

Poster 2

How Far Have We Really Come? The Changing Attitudes of Whites towards African Americans: 1940s-1970s

Sandra Moran, Caitlyn Gomez, University of St. Thomas

In the present study, changing attitudes of whites toward African Americans in the late 20th century were examined through scholarly and popular press articles to investigate changes. In the late 1940's, social perceptions of whites towards African Americans were more blatant with negative words often used to describe feelings towards particular minority groups ("Is prejudice poisoning", 1949). Slight improvement was recorded during the 1950's (Wilkerson, 1959). During this time period, integration was becoming evident, although not common. Many African-American students were viewed as "tokens" rather than individuals (Lewis, 1959). One study demonstrated that attitudes toward integration

and inclusivity of different races were viewed differently than actual interactions with African Americans. In this study, attitudes towards integration were generally positive. Older students responded more negatively than their younger counterparts while attitudes toward physical interactions such as dancing were generally regarded negatively across university and high school-aged students (Wilkerson, 1959). In the late 1960's, research demonstrated efforts towards societal change in African American populations through use of multiethnic readers in an elementary school which increased positive attitudes of whites towards African Americans (Litcher & Johnson, 1969). In the 1970's, more schools and universities desired an increase in diversity which encouraged integration for competition. There was an increase in African-American students at the University of Harvard, which was accompanied by discrimination (Kilson, 1973). The present study reflects the open racism found in the 1940's which shifted to the acceptance of integration in the 1960's, but never reached full group acceptance free of prejudice by the 1970's. Although articles reflected societal belief of acceptance of the minority group, racism still lurked below the surface of integration. We ask: how far have we really come in our society today? Why are many people convinced that structural issues such as racism and sexism no longer exist?

Poster 3

Factors Associated with Sampling River Turtles on the Mississippi River

Mark Hennessy, Andrew Reese, Casey Arensdorf, Christina Chamberlain, and Gerald Zuercher, University of Dubuque

In order to assess the impact of abiotic factors on capture rates of river turtles, we sampled on and around 9-Mile Island within the Upper Mississippi River Wildlife and Fish Refuge (Pool 12) between May and September 2010. Four sites were sampled: the main channel side of the island (MC), the Molo Slough side of the island (MS), a backwater area located on the south end of the island (BW), and a small side-channel that runs within the island (SC). Overall, six species of river turtles were captured during this project: *Chrysemys picta* (painted turtle; n = 69), *Apalone spinifera* (spiny softshell; n = 21), *Chelydra serpentina* (n = 9), *Graptemys geographica* (common map turtle; n = 7), *G. ouachitensis* (Ouachita map turtle; n = 2), and *G. pseudogeographica* (false map turtle; n = 1). We examined the following factors: Daily High Temperature, Daily Low Temperature, River Stage, Moon Phase, Precipitation, Trapping Site, Trapping Session, and Season (early versus late). Response variables were either a binary turtle capture (1 = turtle(s) captured, 0 = no turtle captured) and total turtles captured. Continuous variables were tested via linear regression while categorical variables were tested via Analysis of Variance. Three variables independently explained a significant amount of variation in the data: Trapping Site, Season, and Moon Phase. Two variables, Trapping Session and Rainfall, were not statistically significant ($\alpha = 0.05$) but were suggestive of a trend and need future examination. These results, though preliminary, offer some insight into development of a more effective turtle sampling protocol, the biology behind which needs further investigation.

Poster 4

What it Means to be a Wife: the Changing Role of Wives Throughout the 20th Century

Brin Hanson, Alisha MacDonald, Kathryn Miller,
University of St. Thomas

Archival research was performed using the various marital advice articles from the Ladies Home Journal in the Minneapolis Public Library. Our research covered the entire publication of the magazine through 1889 to the present. Themes and patterns were uncovered for the role of the woman in their marital relationships. During the early period of the magazine, marriage advice was often about formalities and etiquette that the wife should have. In the 1930's, marriage advice mainly consisted of how a wife should run her life in order to not displease her husband. Her own interests are considered of little importance and good marriages are based a wife who is sensible and a good housekeeper. In the 1940's while features like good housekeeping and cooking are still important, the more emotional relationship of marriage gains recognition, stating that a good housewife should be a good listener and respectful to her husband. In the 1950's and early 60's, the wife is not seem as someone who simply cares for her husband, but someone who has an integral role in the well-being of the marriage. Much advice is given to the wife on things she can do to create a stable and satisfying marriage. The 1970's gave way to a shift in marriage advice, where mutual interests of both partners became important, especially with the increasingly common notion of the working wife. Towards the end of the century and presently, marriage advice was more sparse and often had to do with the sexual aspect of the relationship. Through the century, certain aspects of advice were also consistently present, but varied in their prominence, such as the role of love in marriage.

Poster 5

NCLEX Passing Rates in BSN Programs that Incorporate Evidence-Based Practice and NCLEX Preparatory Programs

Kristen Nordahl, Toni Wissestad, Viterbo University

Within a health-care environment that is constantly expanding and intensifying, healthcare providers must perform at higher levels to meet increased expectations. For nurses, using evidence-based practice (EBP) allows them to look more deeply into practices that safely promote patient health and enhance patient health outcomes. Due to the higher expectations of nurses and increased standards of practice, many nursing programs are beginning to implement (if they haven't already) the use of EBP into their curriculum. NCLEX preparatory programs are also being incorporated into curriculums. The purpose of this research project was to examine the correlation between the use of EBP in BSN program curriculums, as well as the use of NCLEX preparatory programs, and whether the incorporation of these factors affected NCLEX first-attempt passing rates.

Poster 6

Structure-function Differentiation of B-edge Negative-design Variants of Hemolysin A using Size-Exclusion Chromatography

James McDermott and Todd Weaver,
University of Wisconsin-La Crosse

Hemolysin A (HpmA) from *Proteus mirabilis* is secreted via a Two-Partner Secretion (TPS) pathway, which is utilized by Gram-negative bacteria as an energy-independent mechanism for secretion of virulence factors. Truncated HpmA (HpmA265) has been shown to activate full-length HpmA in a template-assisted fashion. Crystallographic analysis of HpmA265 revealed a right-handed β -helical structure and a dry dimeric interface between exposed carboxy-terminal β -edges. A series of carboxy-terminal mutants of HpmA265 were engineered using negative-design theory, where a positively charged lysine residue was substituted at the non-polar dry, dimer interface. The replacements included phenylalanine 241 (F241K), methionine 245 (M245K), and leucine 263 (L263K). Recent circular dichroism and hemolysis studies reported decomposition of the classic beta signal and loss in hemolytic activity for M245K and L263K. To further investigate the relationship between HpmA265 structure and function, quantitative hemolytic activity was mapped to the resultant size-exclusion chromatogram. Template-assisted hemolysis of HpmA265 after size-exclusion chromatography (SEC) showed hemolytic activity corresponding to a molecular weight of 27 kDa. This is close to the monomeric weight of 25 kDa for HpmA265, which suggest a monomeric form of HpmA265 initiates the folding of full-length HpmA during hemolysis. Template-assisted hemolytic activity of HpmA265 variants, F241K, L263K, and M245K, had activity concentrated around a molecular weight of 21 kDa, which again is indicative of monomeric activation of hemolysis. The following awards supported the research: NSF-RUI (0744754) to TMW and ASBMB-UAN Undergraduate Research Award to JJM.

Poster 7

Who Do We Blame and How Did they Help? A Historical Look at Juvenile Delinquency-Treatment and Prevention (1830s to Present)

Kaytie Kocon, Amy Suek, University of St. Thomas

The purpose of this study is to further understand the historical to present day treatment of juvenile delinquents in the mental health system. This qualitative, archival study will show the development and change of the societal view of young people from 1830s to present day through scholarly and popular articles.

Poster 8
Characterization of the Target Proteins of
YciC in Bacillus subtilis

Du Wayne La Fountain, Scott Gabriel, Viterbo University

Zinc homeostasis is an important characteristic of organisms throughout all kingdoms of life. In humans, zinc is an important cofactor for many proteins. Slight imbalances in zinc homeostasis can cause mitochondrial damage and lower the functionality of various organelles, zinc levels reduce through aging, and research also suggests that neuronal expression of pro-Alzheimer's disease factors can alter zinc homeostasis. Ultimately, a higher understanding of zinc homeostasis can open options in the medical field for future drug targets that can act on zinc-related biological functions. In this study, *Bacillus subtilis*, a gram-positive bacteria, was used as a model system in order to further understand zinc homeostasis. In the case of *Bacillus subtilis*, proteins involved in zinc uptake are regulated by the protein Zur. One of these proteins is YciC, which is known to be involved with zinc uptake because of its inclusion in the Zur regulon. Although the function of YciC is not known, it is a proposed metallochaperone because its genomic sequence is conserved across the COG0523 family of metallochaperones. In order to infer more information about its function, the objective of this study is to find target proteins of YciC. A yciC-HA tagged insert was ligated into the commercial vector P1730. The new plasmid was named pDL1, linearized, and inserted into the genome of *B. subtilis* strain GB50, a zur and yciC gene knockout of the wild-type strain CU1030. Further experiments will be done to determine the target proteins of YciC including a western blot, coomassie blue stain, and mass spectrometry.

Poster 9
Floral B function MADS Box Genes
and Pansy-lip Peloria in Orchids

Rusmira Ahmetasevic, Cellese Griffin,
Rasika Mudalige-Jayawickrama, University of Dubuque

The orchid family is one of the most species-rich plant families with obligatory bilateral symmetry (zygomorphy). Orchid floral symmetry is determined by the presence of a highly modified dorsal petal termed lip (labellum) and a column, a structure made by the fusion of the stamen, the style, and the stigma. The main goal of our research is to isolate and characterize the key genes involved in determining the symmetry of orchids using peloric mutants. In pansy-lip peloria, the modified lip is reverted back to a normal petal changing the floral symmetry from bilateral to radial. The floral symmetry in *Phalaenopsis* orchid is suggested to be regulated by the differential expression of DEFICIENCE-like (DEF-like) MADS box genes of ABC type floral homeotic genes. The floral symmetry in several eudicot plant families was proven to be regulated by TCP transcription factors. We have isolated four DEF-like MADS box genes, the orthologs of *P. equestris* genes implicated in

regulation of floral symmetry, from the *Dendrobium Ethel Kamemoto* hybrid. The expression profile of one of these genes, DkMADS 4, the ortholog of the key gene suggested for control of lip formation, contradicts with that of *Phalaenopsis*. Our results suggest that the simple model for orchid floral symmetry based on *Phalaenopsis* MADS box gene expression of three lip peloric orchids might not be applicable to pansy-lip peloria of *Dendrobium*. We have also identified two TCP genes, Den-TCP-1 and Den-TCP-2, differentially expressed between the normal and peloric sibling lines of *D. Ethel Kamemoto*. Expression profile of Den-TCP-1 suggests it is preferentially expressed in the dorsal region of the young floral buds. We will discuss the possible role of TCP genes in determination of floral symmetry.

Poster 10

Measuring Boldness Behavior and Its Effects on Mate-choice Copying in the Guppy (*Poecilia reticulata*)

Julia Umhoefer, Michael Alfieri, Viterbo University

In natural environments, organisms are faced with situations that often require risk. The amount of risk an individual is willing to take has been the focus of recent research and risk taking behaviors have been termed “bold” (high risk) or “shy” (low risk). Within a single population there may exist large variation in the amount of bold and shy behaviors displayed. One potential risky situation encountered by prey is the choice to leave the relative safety of a refuge to search for mates and thereby exposing oneself to potential predators. One method to potentially minimize such risk is to copy the mate choice of a conspecific. Mate copying is a type of mate-choice in which a female may choose a male after he was previously chosen by another female. In this study, the guppy, *Poecilia reticulata*, was used to test the role that individual bold or shy behaviors have on mate copying. The boldness of a focal female was determined by their behavior in the presence of a predator. Courtship differences were recorded as the focal female was allowed to choose between two available males after viewing a model female interact earlier with one of the available males. Results showed that bold females spent significantly more time than shy females near male guppies regardless if that male was the mate that had prior exposure with the female (i.e., the “mate copied male”). This research suggests that bolder females may be more prone to inspect potential mates than shy females.

Poster 11

Soil Analysis of Varied Farming Practices at the FSPA Villa in St. Joseph, WI

Kathryn Korthauer, Bethanee Nitz, Christopher Iremonger,
Sister Lucy Slinger, Viterbo University

As the organic food movement becomes more popular, more people are looking for different answers to how farming practices affect land quality. The Franciscan Sisters of Perpetual Adoration (FSPA) are among those who are looking to transition to local, organic, and small farm food sources. The Sisters, over the last few years, have begun to expand their garden. They are also requiring a transition of farming practices on a portion of the land they rent out. This land is being farmed without the addition of commercial fertilizers or pesticides in hopes of being organically farmed again someday. The Sisters decided it would be important to have baseline data on soil quality of their land so that more ecologically conscientious decisions can be made regarding the land. Therefore, throughout the summer of 2010, a variety of soil tests were performed in the organic, conventional, and transitioning cropland. The soil tests included: pH, nitrate, soil respiration, infiltration, and soil aggregate stability. Soil samples were also sent off to the UW Madison Soil and Plant Analysis Lab in order to test for pH, phosphorus, potassium, and organic matter. This poster compares the data collected between the different types of cropland and farming practices.

Poster 12

Free People of Color and How They Influenced the Haitian Revolution

Christopher Colgan, Viterbo University

Throughout the course of history many stories of independence have influenced cultures and societies in their quest for freedom from tyranny. None have been so forgotten as the Haitian Revolution, an immense slave revolt against French masters that led to the formation of the world's second free and independent nation in the western hemisphere. For white planters on the island of Saint Domingue- the French name for their former colony- it was a fear long realized, a triumph of freedom that threatened the stability and wealth of white and free colored French. Through the agency of characters of the Haitian Revolution I have determined that each racial class in Haiti had specific objectives to gain from the struggle. The slaves fought for their freedom and independence. Players within the racial class of the free people of color also had goals, more financial and economic than personal and political. Through characters such as Julien Raimond, we can establish that people of color on the island of Saint Domingue promoted the existence of slavery because their economic interests lay within the institution and the planter economy. In conclusion, it is interesting that free people of color lobbied in Paris for the extension of the slave trade and the existence of slavery in France and her colonies. While many free people of color

were products of slavery, their interest in the institution was spurred with their status of equality to white people on the island. Understanding why and how the free people of color influenced the revolution is one of my primary objectives.

Poster 13
**Interactive Multimedia Tools in Flash for Visual
Communication Projects**
Santiago Perdomo-Mumbru, Viterbo University

Flash-based websites are well known as being dynamic and interactive with various effects provided by animations and movements. Their high level of interactivity allows users to get more involved with the content and be more engaged with the site improving their web experience. This project is focused on the development of Flash tools to be used in visual communication projects that will engage the users in the content interface and provide them with an interactive experience. Having researched and analyzed the advantages of these tools, I explored how it can be used in numerous applications including web and interface design.

Poster 14
**Individual Differences in Preschoolers' Categorization Biases
that Extend Across Tasks**
Samantha Schwartz, Liza Ware, Viterbo University

When investigating how preschoolers' categorize objects, two approaches are generally used by researchers, do the children categorize objects based on 1) taxonomic (e.g. dog-pig) or thematic relations (dog-doghouse) and 2) overall shape similarities or function similarities? Asking these questions has provided some insight into children's conceptualization of objects. Overall, preschoolers favor no one strategy reliably over the other. However, they are sensitive to the different kinds of objects being categorized (e.g. animates vs. artifacts). Individual biases were also found and in some cases can be linked to language development. For example, a participant who categorizes according to taxonomic relations is more likely to have a larger vocabulary of nouns. The current research connects these approaches together by exploring whether these biases extend across tasks. For example, some children might focus more on relations (causal, spatial, functional, temporal), and thus tend to categorize both thematically and functionally. Other children might focus more on object identity and attributes, and thus tend to categorize taxonomically and perceptually (e.g., by shape). We also examined associations between categorization biases and vocabulary (measured by the Peabody Picture Vocabulary Test [PPVT-4]). Our results found that 3-, 4-, and 5- year olds displayed a thematic bias in the taxonomic/ thematic task and a function bias in the shape/function task. While this was true for all groups, a correlation between proportion function-match responses and

thematic-match responses were only found in 5- year olds, especially when the target was an artifact. A correlation was also found between the proportion of function-match choices and verbs correctly identified on the PPVT-4, and between the proportion of thematic-match choices and their overall PPVT-4 score across age groups. These outcomes support prior research that categorization biases are related to language development and emerge early on.

Poster 15

Production of IL-2 by activated Jurkat cells and Peripheral Blood Lymphocytes treated with Cyclosporin A and Fungal Extracts

Shanikka Arnold, Samantha Jackson, Ward Jones, Viterbo University

T-cells play a very important role in controlling the specific immune response. When T-cells recognize antigens, cytokines are released resulting in activation of B-cells, T-cells, and macrophages. Interleukin-2 (IL-2) is an important cytokine that plays a major role in maintaining an appropriate immune response, thus protecting us from a variety of infectious agents. Under most circumstances, this is beneficial to maintaining health. However, attenuation of the immune response is often necessary in tissue transplant recipients. Past studies have shown the immune response may be diminished through inhibiting IL-2 production. Cyclosporin A (CsA) is a well known inhibitor of IL-2. The purpose of our study was to test the consistency of IL-2 inhibition by CsA. To do this, we cultured human peripheral blood lymphocytes (PBLs) and Jurkat cells with activators and CsA. Supernatant samples of each culture were analyzed for IL-2 concentration via ELISA. One would expect IL-2 inhibition to decrease with each subsequent serial dilution of CsA. As expected, the Jurkat cells most often followed this trend. However, our PBL results consistently showed this trend only for the first two dilutions of CsA. Production of IL-2 via PBL cells was variable at higher CsA dilutions. These results suggest there are multiple factors involved in IL-2 inhibition within mixed lymphocyte populations. Also, PBL production of IL-2 when treated with novel fungal extracts must be analyzed carefully to account for this variability.

Poster 16
**Digging Deeper: Factors Effecting Body Image
Between Men and Women**

Cassandra Berning, Jamie Jones, Mekenzie Reps, Alyssa Habberstad,
Acacia Gammage, Robert Sasseti, Elizabeth Seebach,
St. Mary's University of Minnesota

The purpose of our study was to examine factors that affect body image in men and women. The dependent variable for the study was body image and the independent variables were social comparison, body esteem, self esteem, “fat talk”/body cognitions, and irrational food beliefs. The hypothesis for women was that social comparison, body esteem, self-esteem, “fat talk,” and irrational food beliefs influences body image. The hypothesis for men was that social comparison, body esteem, self-esteem, body cognitions (a male equivalent of “fat talk”), and irrational food beliefs would influence body image. We found significant differences between men and women on Social Physique Anxiety, Appearance Related Schemas: Self-Evaluative Saliency, Body Esteem Appearance, Body Esteem Weight, Body Esteem Attribution, and Self-Esteem. Men scored higher than women on all of these variables.

Poster 17
**The Effects of 670nm Photoirradiation and Paraquat Exposure
on the Expression of Hsp70 in *Drosophila melanogaster***
Alex Metzler, David Bauer, Viterbo University

Damage caused by excessive free radicals in biological tissue, known as oxidative stress, has been implicated in the development or exacerbation of abnormal aging including neurodegenerative disorders. Cells experiencing oxidative stress are known to express Heat shock protein-70 (Hsp70) at levels much higher than normal, and this expression can be used as a general marker of cellular distress. Hsp70 is involved in apoptotic processes. In this pilot study, wild type *Drosophila* were exposed to the herbicide paraquat, a chemical known to increase oxidative stress and Hsp70 expression, and treated with 670 nm photoirradiation. The treatment was expected to ameliorate cellular damage by reducing oxidative stress, as measured by decreased Hsp70 expression. In previous research, 670 nm photoirradiation has been demonstrated to facilitate wound healing and provide neuroprotective effects to environmental toxins. Hsp70 expression was measured by quantitative real-time reverse transcriptase polymerase chain reaction (qRT-PCR) and results demonstrated a significant increase in expression for flies exposed to paraquat, but no significant effect of the photoirradiation treatment. These results suggest that 670 nm light may not influence cellular processes involved in Hsp70 expression; however, these pilot data are incomplete and a full evaluation is warranted.

Poster 18
Race and Employment in 2009 Movies
Amber Kaio, Viterbo University

Within our research, we examined the relationship between race and employment depicted in movies. We used the top ten grossing movies of 2009 and gathered information of the employment status of the main and secondary characters in each film. We found that 83.7 percent of all white characters were employed. Black and Hispanic characters were employed 50% of the time.

Poster 19
**Crime Rates According to Property Values Within the Voting
Districts of La Crosse, WI.**
Jenna Strait, Viterbo University

Within our study we focused on reviewing crime in relation to property values. Through our research we have established the following hypothesis: where the crime rate is higher the property value will be lower. Within this study, we examined whether or not a correlation or relationship between crime rates and neighborhood property values exists. We began by gathering data from the City of La Crosse through the city's official website, which displayed a map of the city and it allowed us to break it down into voting districts and compile data from each district. We then compiled crimes and types of crimes over a three month period (June 2010 through August 2010). Crimes were broken down according to category such as theft, homicide, assault, and crime to property. In order to identify the neighborhoods according to property values we contacted the city assessor and obtained median sales price for sales incurred during 2010 of homes in each voting district. The data was placed into categories that were deemed low value, medium low value, medium value, middle upper value, and upper value. Using the crime data and the maps indicating the different property values we made a correlation between the two sets of data. The results show that the most crime occurred in the medium-low and medium value districts. 43.53% of total crime occurred in the medium-low districts. The high value districts had the lowest total crime with 14.24% which was consistent with the hypothesis. The findings of our project do not decisively confirm or deny that there is a correlation between crime and property value in the La Crosse area. A possible reason that crime seems to be so disproportionately low in the low value areas may be due to lack of reporting.

Poster 20
Application Demographics for a Public Defender
Kelsey Connor, Viterbo University

The demographics of accepted applicants versus denied applicants for a public defender in La Crosse County were analyzed to identify possible biased variables within the criminal justice system. Our group randomly selected 50 denied applicants and 50 accepted applicants from the public defender's office in La Crosse. Analyzing sex, race, employment, educational level, and income, our group found that income was the only deciding variable. In conclusion, if an applicant was unemployed and made less than \$0 a month in combined assets and income, he or she would most likely be eligible for a public defender regardless of sex, race, or educational level.

Poster 21
Social Class Portrayals on Primetime Television
Richie Benish, Viterbo University

The research topic that we are interested in is the depiction of occupations and what social classes those occupations represent in accordance to the actual social structure levels in America. Previous literature has shown that the average US worker is not shown on television and typical occupations displayed are usually ones of higher prestige. We have taken the incomes from the occupations we viewed and put them into income brackets to determine who is represented most frequently and if those percentages are accurate with America. We concluded that most people fall around the average median income in America.

Poster 22
Influences of Wisconsin Graduation rates
Kelsey Mattick, Viterbo University

In our research, we hope to discover how graduation rates may differ in Wisconsin and the La Crosse public school district based on race/ethnicity and socioeconomic status. Using the online data supplied by the Wisconsin Information Network for Successful Schools, we analyzed the above regions and the corresponding graduation rates for the 2008-2009 academic year according to the overall class rate, as well as by race/ethnicity and socioeconomic status. When analyzing how race/ethnicity and socioeconomic status influence graduation rates for high school students in Wisconsin we found significant correlations. In Wisconsin high schools, it is evident that there is a higher graduation rate among students who are economically advantaged than those who are disadvantaged.

Poster 23

Pre-gaming on a College Camps: Extent and Definition

Caiti Knudson, Steve Lochen, Casey Twardowski, Melissa Murphy,
Rachel Otten, Cathy Rennie, Elizabeth Seebach,
St. Mary's University of Minnesota

Pre-partying has become an area of emerging importance when discussing drinking on college campuses (Pedersen, LaBrie, & Kilmer, 2009). This study investigated student drinking behaviors and beliefs. A sample of 141 students completed a survey addressing their typical drinking behavior, beliefs about the effects of alcohol, beliefs about the role alcohol should play on college life, and examined their pre-partying patterns. Forty-eight percent of participants reported bingeing on a typical Saturday night. The majority of people believe alcohol has the following effects: enhances social activity, breaks the ice, allows people to have more fun, and gives people something to do. Most people were neutral about the role alcohol should play in college life. However, seniors saw alcohol playing the most prevalent role and freshmen saw alcohol having the least prevalence in college life. Participants were asked to define what “pre-gaming” meant to them, 96 participants identified “pre-gaming” as drinking before out. Pre-gaming was assessed by having participants track their previous weekend and identify how many locations drinking occurred. The number of locations increased as the weekend progressed; the maximum number of stops on was 3 on Thursday, 4 on Friday, and 5 on Saturday.

Poster 24

The Use of Physical Restraints in the Treatment of Mental Illness

Grace Brelje, Angela Lee, Bryant Dentz, University of St. Thomas

How to treat and manage the behavior of those who suffer from mental illness is a long-standing problem. This study investigated the types of physical restraints used throughout history and the justifications for the use of physical restraints. Scholarly peer-reviewed journals and popular press articles from 1820 to the present were reviewed. It was found that physical devices have been used as a social management tool for mental illness. Restraints were not a form of treatment but rather employed as a way of keeping patients quiet and preventing them from hurting themselves or others. However, with pharmacological advances, public awareness, and new state and federal laws, the use of restraints has decreased and become more humane. The use of shackles, chains, and cages to control patients' behavior transformed into the use of straitjackets and sedatives. Nevertheless, physical and pharmacological restraints are still utilized today and instances of injury and death still do occur.

Poster 25

Characterization of a Genetic Interaction Between SBP1 and WHI3 In *Saccharyomyces cerevisiae*

Kelly Theede, Scott Segal, Winona State University

Proper regulation of cell cycle progression is necessary to ensure that cells do not undergo uncontrolled cellular division. Uncontrolled division results in cells of significantly reduced volume, as well as cancer formation. The cell cycle is regulated by three checkpoints, the most important of which is the G1/S checkpoint. Passage through this checkpoint commits the cell to replicate its DNA and go through a round of division. In the budding yeast *S. cerevisiae*, the G1/S checkpoint is sensitive to Cln3p levels. Cln3p, a homolog of the human cyclin D, forms a complex with Cdc28p to activate expression of downstream genes allowing passage through the G1/S checkpoint. Regulation of Cln3p levels ensures that the cell passes through the G1/S checkpoint at the appropriate time. Cln3p levels throughout G1 phase are, in part, controlled by local translational repression of the CLN3 mRNA by Whi3p, an ER associated RNA binding protein. The mechanism of how Whi3p mediates translational repression of CLN3 mRNA is unknown. Previously, WHI3 was found to genetically interact with SBP1, a gene encoding an RNA binding protein involved in general translational repression. In this work, we characterized the genetic interaction between WHI3 and SBP1 by overexpressing Sbp1p in *whi3Δ* strains. High overexpression of Sbp1p in *whi3Δ* strains resulted in lethality at 37 C, whereas low overexpression resulted in a moderate growth defect at 30 C and a significant growth defect at 37 C. To determine the nature of the growth defect, we determined whether low Sbp1p overexpression could suppress the cell volume defect in *whi3Δ* strains by calculating budding cell volume of mid-log phase cultures grown at 30 C and 37 C. We found that *whi3Δ* cells overexpressing Sbp1p were significantly larger at 37 C than *whi3Δ* cells but were not significantly larger at 30 C.

Poster 26

Effects of 670 nm Light Therapy and Paraquat Consumption on Longevity and Oxidative Stress in *Drosophila melanogaster*

Shamaco Green, James Peterson, Aleksey Sakharuk, Patrick Hamoy and David Bauer, Viterbo University

Substantial evidence suggests a role of oxidative stress and mitochondrial dysfunction in neurodegenerative disorders and aging. Mitochondria demonstrate photoreceptivity for specific wavelengths of light in the far-red to near-infrared spectrum, and treating various tissues with daily exposures of 670 nm photoirradiation enhances wound healing and provides neuroprotection against mitochondrial toxins including potassium cyanide. The current experiments explored the therapeutic effects of 670 nm light by assessing oxidative stress and longevity in *Drosophila melanogaster* consuming paraquat, a substance known to damage mitochondria, increase oxidative stress, and reduce lifespan. We hypothesized

that light therapy would reduce oxidative stress and extend longevity in flies exposed to paraquat. Both experiments employed a 2x2 design in which virgin male flies consumed either untainted food or food mixed with 15 mM paraquat, and received either no light therapy or 10 minutes of 670 nm light exposure per day. Oxidative stress was measured after 10 days of treatment in whole-body homogenates by assaying 8-isoprostane standardized to protein. Although the pattern of results fit expectations, intergroup variability precludes conclusions of statistical significance. Flies in the longevity study received daily light therapy until expiration and differences in average lifespan between groups were clearly demonstrated. Flies consuming paraquat and receiving daily light therapy demonstrated an average longevity increase of 76.09% over flies consuming paraquat but not receiving light therapy (10.46 vs. 5.94 days). Flies consuming untainted food expressed a similar pattern, with flies receiving light therapy surviving an average of 55.43% longer than untreated controls (22.88 vs. 14.72 days). These results suggest a potential therapeutic role for 670 nm photoirradiation in both normal and abnormal aging, including conditions in which oxidative stress may play a role such as neurodegenerative disorders. Future studies will further characterize the effects of light therapy and explore the mechanisms of action contributing to increased longevity.

Poster 27

Effects of Repeated Triadimefon Exposure on Anxiety in the Light/Dark Box Task

Michael Fitzgerald, John Holden, Winona State University

The triazole fungicide triadimefon (TRI) has been of interest to toxicology in part because of its interaction with the dopamine transporter, through which mechanism it produces cocaine-like stimulatory effects. For this reason, concerns have been raised about TRI's abuse potential and potential to produce lasting effects similar to those produced by sensitizing regimens of dopaminergic drugs. The intent of this study was to examine whether repeated exposure to TRI produced differences in underlying anxiety levels; In past studies in our laboratory, a single acute high-dose of TRI (75 mg/kg) produced stimulatory/motor effects but not effects on anxiety. Subjects (C57BL/6 mice) were exposed to a seven-day, two-injection per day regimen of either 50 mg/kg TRI or corn oil vehicle (OIL). 48 hours later, subjects were tested in the light-dark apparatus, where anxiety levels are measured by the amount of time which subjects spend in a larger, lighted compartment relative to a smaller, darker compartment. It was found that TRI-exposed subjects spent significantly more time in the lighted compartment than OIL-exposed subjects, but did not, like the acutely-dosed subjects, show an increase in motor behavior. This suggests that repeated exposure to TRI may produce lasting changes in emotional behavior.

Poster 28

Sustainable Packaging Design

Caitlin Dettmann, Jenna Lau, Viterbo University

We feel it is our ethical responsibility to expand our critical thinking skills in response to the expanding environmental pressures of society. Our research includes the investigation of the flow of materials and energy used in the design industry and its harmful effects on our environment. Our focus has also been on the role of the graphic designer in society and its transference to sustainable design. While using the influence of sustainable design in combination with our current visual communication skills, we have each transformed our thinking to create a package design project based around sustainable techniques. Each project consists of a tea brand company that we have developed from concept and brand identity all the way through to a complimentary package design. Overall, the projects show the result of our research because we were able to shift or original thinking of creating interesting design elements to developing an entire concept and brand voice to be environmentally sustainable. Each package design incorporates elements that make them re-usable or re-nourishing while giving off virtually no waste. The role of the graphic designer is much more powerful in our society than many may think and our contribution to the sustainable movement is generating awareness. The future of graphic design is sustainable design.

Poster 29

A Male Pilot Study on Resiliency, Relational Development and Recovery: Preliminary Results

Amber Valley, Angela Mensink, Viterbo University

To follow-up on previous research surrounding recovery, resilience, and relationships of women (Karls-Lange, Kokott-Rebhahn, Murray, 2010), this male pilot study explored the same elements for men. The way in which men and women view relationships, and how relationships foster resilience, differs greatly, with males utilizing separation and boundaries in their relationships and women having a more central focus on their relationships (Higgins, 1996). Examining gender differences in relationships is imperative in order to better understand resiliency, as well as examining implications for recovery and treatment needs based on gender. This pilot study consisted of five males who were in recovery for at least 9 months from a substance abuse disorder. Each male participated in an in-depth qualitative interview process that also incorporated quantitative measures. These interviews captured the male participants' resiliency, particular relationships that were meaningful and that helped foster resiliency, and their journey throughout recovery. The qualitative measures included interviews based on Josselson's (1996) Relational Space Maps and Werner & Smith's (1992) 31/32 Year Follow-Up Interview. The quantitative measures used were the Viterbo (2009) Serenity Scale, the Resilience Scale for Adults (Hjemdal, Friborg, Martinussen, & Rosenvinge, 2001), and Rosenberg's (1969) Self-Esteem Scale. This poster presentation will: (a) examine the preliminary rules and themes that

have emerged from the male pilot study, (b) describe the methods, measures, and analysis of the data, and (c) discuss alterations for the larger continuation of the study on recovery, resilience, and relationships for males and females.

Poster 30

Improvement of Phantom Preparation Methods and Backscatter-Scatterer Size Estimation

Randall Nall, Viterbo University

Medical ultrasound uses the intensity of backscattered acoustic waves to generate a black-and-white image of internal body structures. In laboratory settings, items made of gelatin or agar called phantoms are used in place of human tissue for study. In this experiment, the acoustic properties of gelatin and agar phantoms are examined using narrow-band measurement techniques. The concentrations of these phantoms were modified until their attenuations and the speed of sound passing through them closely resemble the average values for soft human tissue. It was found that a 10% w/w gelatin solution provided for the best balance of phantom performance and ease-of-creation. Glass beads were added to the phantoms and the backscatter was measured using a broadband planar-reflector substitution technique. These backscatter readings were taken using pulse-echo transducers and analyzed by looking at the power spectrum of the data. This method of measuring backscatter proved to be effective at frequencies below 10 MHz.

Poster 31

Where Have All the Postmen Gone?

Christopher Burtch, Kellen Gintner, Sara Kamoske,
University of Wisconsin-La Crosse

The Post Office is currently facing a multi-billion dollar budget crisis. With the advances and dependence on paperless communication, the Post Office has seen dramatic decreases in volume in recent years. With already operating from a deficit and expected future losses in volume, what can the Post Office do to get back on its feet? Or is it perhaps already beyond repair? We took a look at the popular solution of removing Saturday delivery. We also applied in depth sensitivity analysis to try and get an idea of the potential accuracy of our results, and which factors seem to be the most important heading forward.

Poster 32

A Lens Model Approach to Understanding Clothing Choice in Regard to Impression Management

Bethany Hastings, Juan Martinez, Kelsi Addabbo, Alyssa Habberstad,
Elizabeth Seebach, St. Mary's University of Minnesota

Students dressing for a formal presentation in a major class have a complex task. They need to determine what “professional” means to the perceiver (i.e. the professor). Our study used photographs of students dressed for formal presentation as stimuli. We recruited faculty and student volunteers to rate “professionalism” of the outfits. Students and faculty did not agree on professionalism, nor did male and female students agree. Next, we used Brunswik’s lens model to determine how professionalism was determined, that is, how important each of nine available cues were in forming these judgments. The weighted cues varied by faculty / student status; gender of the perceiver, and gender of the outfit.

Poster 33

Outcry of the Spirit: The Historical Framing of Religious Delusion in the United States

Ryan Persons, Aylie Meisner, Chris Antonelli,
University of St. Thomas

Religion can provide individuals with a sense of direction and comfort. In certain cases, however, religion presents a medium through which mental disorders are manifested, leading to grandiose delusions with spiritual content. The aim of the present study was to use qualitative, archival research to examine the evolution of popular press and scholarly research perspectives on religious delusion from the 1820's onward. In the 1820's, revivals, defined as “an outpouring of the spirit,” were usually blamed for religious fanaticism by the popular press (“Religious Fanaticism,” 1824). Relying heavily on melodrama, the press recounted graphic tales designed to rouse emotion. In the 1830's, news articles examined preachers suffering delusions supposedly caused by the doctrine they preached (“Effects of Religious Delusion,” 1836). The emphasis on false doctrine continued into the 1840's, highlighting “religious excitement” in practitioners (“Religious Delusions,” 1842). While religious delusion nearly disappeared from the press after the 1840s, by the 1870's, there was a clear shift from opinions and speculation to objective reporting, a pattern that continues today. By the early 1900s, psychologists began to examine delusions almost exclusively in patients with schizophrenia. Many early psychologists, such as Sigmund Freud and William James, took a subjective/speculative approach, examining the delusional content for clues into the subconscious. They hypothesized that the delusions were exaggerations, of traditional belief systems, triggered by schizophrenia. By the 1950's, psychologists began favoring objective testing and large samples of delusional individuals. Religious delusions were still linked to cultural norms, but as being distorted rather than exaggerated. Modern psychology employs neurological

methods, studying brain activity in areas correlated with delusions (Puri, Sudesh, Kuldip, Manjinder, & Richardson, 2000). Furthermore, a focus is placed on the link between delusions and severity of schizophrenia. Thus, as our understanding of the human mind has evolved, so has our perspective on religious delusions.

Poster 34

Effects of Acute Triadimefon on Behavior in the Tail Suspension Paradigm for Two Strains of Mice

Wei Lin Poh, John Holden, Winona State University

Triadimefon (TRI) is a fungicide that produces cocaine-like effects in the brain through interaction with dopamine transporter molecules. Although toxicology researchers have suspected that triadimefon may have abuse potential, little research has addressed its behavioral properties. In this study we examined the effects of an acute dose of TRI in the tail suspension task, an animal model of depression, in two strains of mice. It was found that TRI decreased immobility in the C57BL/6 strain of mice but not in the Swiss Webster strain. This represents the first tentative evidence that triadimefon exposure may alter emotional processes in the brain and this may speak to its potential for abuse and potential for damage should environmental exposure occur.

Poster 35

The Effect of Sub-lethal Concentrations on *Bacillus cereus*

Adeline Ngum, Dorothy Wrigley,
Minnesota State University-Mankato

Nisin is a biopreservative that is produced by *Lactococcus lactis*. It can be used to inhibit Gram positive bacteria in foods. Other Gram positive bacteria in foods are not killed by the concentrations used in foods but may be affected by sublethal concentrations. The purpose of the study was to investigate the effects sublethal concentrations of nisin have on *Bacillus cereus* and its subsequent growth with further exposure to nisin. *B. cereus* was conditioned to nisin by culture in 100 µg/ml nisin in Tryptic Soy broth. I examined the inhibitory concentrations of nisin on conditioned and control *B. cereus*. The inhibitory concentration for the control was 200 µg/ml. Conditioning increased tolerance to 300 µg/ml. To determine the percentage of cells surviving in nisin, I plated ~500 colony forming units on to tryptic soy agar containing 0, 50, and 100 µg/ml nisin. No colonies of control *B. cereus* formed on nisin containing plates. However, 83 colonies of the nisin conditioned *B. cereus* grew on the 50 µg/ml plate. No colonies were formed on the 100 µg/ml plate. Conditioned *B. cereus* when removed from maintenance cultures with nisin rapidly reverted to the more sensitive phenotype of the control. Sublethal concentrations of nisin induce a more resistant phenotype in *B. cereus*.

Poster 36
Secrets in the Dark:
Assessing Southern Flying Squirrel Ecology in Eastern Iowa
Tori Ballweg, Christine Grannis, Gerald Zuercher,
David Koch, University of Dubuque

Southern flying squirrels, *Glaucomys volans*, are considered a species of "Special Concern" in Iowa. Within Iowa, their abundance is officially "Uncommon" and their population trend is "Unknown." Although their reported distribution in Iowa includes all but the extreme northwest corner, there are relatively few records for the species within the state. As part of a pilot project, we documented a population of southern flying squirrels in Mines of Spain Recreation Area, a state park in Dubuque County, Iowa, situated within the bluffs along the Mississippi River. Two transects were established along park trails. Ugglan multiple-capture traps were placed between 12 and 15 feet off the ground in large trees, baited with peanut butter, and checked each morning. We successfully captured and tagged 20 individuals (12 males and 8 females) and recaptured 10 individuals (8 males and 2 females), some as many as six times. While both recaptured females exhibited strong site fidelity, five males were captured on both transects. This difference needs further investigation as it seems to suggest that males utilize much larger areas than females. Our success in capturing and recapturing southern flying squirrels will be the basis for development of long-term monitoring and assessment of this species in eastern Iowa. In addition, we intend to further investigate movement patterns within the park and adjacent areas.

Poster 37
Coelomocyte Control of Bacteria Population by Phagocytosis
in *Eisenia fetida*

Anna Novak, Dorothy Wrigley, Minnesota State University-Mankato

Earthworm immunity is characterized by coelomocytes, leukocytes housed in the coelomic cavity of earthworms. Coelomic cells are a mixed population that phagocytize and detoxify chemicals. Earthworms also have at least one symbiotic bacterium that is passed from parent to offspring eggs. The genus of the symbiote suggests their function is proteolytic in origin. The population size of the symbionts must be controlled or they would kill the earthworm. My hypothesis is that coelomic cells aid control of bacterial number by phagocytosis. To test this hypothesis I examined the ability of coelomic cells to bind a symbiont isolated from earthworm cocoons. Coelomic cells were collected from earthworms, *Eisenia fetida*, by electrical stimulation. The coelomic cells were mixed with freshly cultured symbionts, and incubated for up to an hour. The experimental control was cells that are not incubated the bacteria. At 30 minutes and at 60 minutes the cells were assessed for adherent bacteria using a gram stain method. The cells were also mixed with

sterile glucose, mannose, and galactose and then assessed for adherence using a gram stain method. When the bacteria were suspended in glucose, galactose, or mannose containing buffer and then mixed with coelomic cells the adherence decreased. Of the cells without exposure to sugar 80% showed an adherence to the symbiots. The greatest amount of adherence was present at the 30 minute incubation level and, at 60 minutes adherence decreased. The cells that were exposed to sugar showed a decreased level of adherence, with glucose being the sugar with the most effect. The data indicate that coelomic cells recognize and bind to the symbiont and that the adherence is mediated by sugar binding.

Poster 38

The Ability of Exercise to Delay Type II Diabetes and Preserve Peripheral Function in High Fat Fed Mice

Kaila Schoenberger, Ellis Jensen, Viterbo University

Type II diabetes mellitus is the most common type of diabetes in which the body produces too little insulin or the cells are resistant to insulin. Diabetic peripheral neuropathy (DPN) is a prevalent complication of diabetes that causes loss of feeling in the feet. Lack of pedal sensation allows foot injuries to result and go unnoticed. This can affect the amount of exercise diabetics can perform without damaging their feet. The goal of this research is to determine the effect of pre-diabetes exercise on high-fat fed (HFF) diabetic mice, with a focus on diabetes severity, change in activity, and DPN. To investigate the relationship of pre-diabetes exercise and the onset of diabetes, mice will be partitioned into exercise or sedentary groups. Their activity will be recorded with bike computers attached to running wheel apparatuses. Blood glucose levels will be monitored, as well as their body weight and change in activity. A one-way ANOVA test and post-hoc t-test will be used to determine if significant differences are found between the groups. Established DPN tests from the University of Michigan will be used to determine the severity of DPN in the mice. If both groups of HFF mice develop diabetes at the same rate and have the same severity of DPN, then this will show that pre-diabetes exercise does not positively affect diabetes. If the exercise group of HFF mice develop diabetes at a slower rate and have less severe DPN than sedentary HFF mice, then this will show that pre-diabetes exercise positively affects those with diabetes.

Poster 39

Moved to Oral Presentation 3PM RC201

Poster 40
The Relationship Between Young Adults and The Natural Environment

Sarah Arnold, Viterbo University

This review is based upon the relationship of young adults (ages 19-40) and their reaction to the natural environment. The purpose of this study was to determine if young adults, compared to other individuals, have decreased environmental stewardship and environmental sensitivity. The study also considers the possible reasons for this decrease. Previous studies and reviews were considered in determining this conclusion. This review will also explore Richard Louv's thoughts in his book, *Last Child in The Woods*, and Wendell Berry's thoughts about society. Finally, this paper will highlight some possible solutions to this problem, guided by the experiences I, the author, have experienced while interning at the Mississippi Valley Conservancy.

Poster 41
Preliminary Analysis of the Diet of Juvenile Fish in the Upper Mississippi River

Joseph Bottcher, Aaron Wood, Michael Delong,
Winona State University

Little is known about the diets of larval and juvenile fish within river-floodplain ecosystems. Larval and juvenile fish consume a variety of invertebrates and zooplankton, which can include but is not limited to rotifers, copepods, and cladocerans. Diets of 0+ year fish can vary spatially, temporally and ontogenetically. These dynamics are particularly relevant to large floodplain rivers because of spatial complexity created by a diversity of habitats. Additional heterogeneity is added through the natural hydrological pattern which increases spatial complexity and influences the types of food resources available. This study investigated the diet, including ontogenetic shifts, of juvenile fish within varying habitats of the Upper Mississippi River. Fish were collected from habitats of differing levels of connectivity to the main channel, June - September 2009 - 2010. Fish were collected using an ichthyoplankton net and light traps. Fish were dissected and stomachs removed. Gut contents were identified and quantified based on relative abundance. Fish length and weight were also recorded. There was a significant linear relationship between both relative abundance of zooplankton and invertebrates to fish length. The intersection of regressions for both groups of food items indicated that the diet of fish < 40 mm total length (TL) was predominantly zooplankton whereas benthic invertebrates dominates the diet of fish > 40 mm TL. Zooplankton consumed by fish consisted primarily of small Cladocera (*Bosmina* and *Chydoridae*) and Ostracoda (seed shrimp). Densities of these taxa in the water column of backwater lakes was less than those of the main channel, where densities should be lower given lower hydrological retention of the channel. Differences between cladoceran densities in backwaters, where abundance should be highest, and the

main channel suggest that larval fish might regulate zooplankton community structure in hydrological retentive patches of the river.

Poster 42

Milton's Cause: An Examination of Scripture and Politics in Paradise Lost

Kyle Jennings, Viterbo University

My presentation will be based on a paper written following my summer research project. This project will focus on answering questions I have about John Milton's use and manipulation of scripture in his work *Paradise Lost*, as well as the political undertones of the poem. Milton's portrayals of Satan, God, and the lesser devils and angels reflect the political instability of leadership in England during and after the civil war, as well as Milton's own changing political views. These portrayals can be read as representations of English rulers Oliver Cromwell and Charles I, both of whom Milton held issues with following their rule. My research will examine in depth the passages of scripture that Milton appropriated and manipulated Genesis 1 and 2 in particular, to serve his political agenda. Additionally, my paper will include an analysis of the creation stories in the Bible and a comparison of those stories to Milton's final product.

Poster 43

Christian Influence on Corporal Punishment in America: Historical Perspectives

Jake Seltz, Samantha Lane, Sam Glynn, University of St. Thomas

The Christian tradition has often been associated with strict child rearing practices, including corporal punishment. This has fueled a debate between Christian theologians that has been apparent since the 4th and 5th centuries and continues today in regards to the effectiveness, legality and negative effects of corporal punishment. Even with the evolution of this debate through the years, there has been no universally accepted doctrine that explains the proper place for corporal punishment in the Christian tradition. Gathering qualitative information from a host of sources including scholarly journals, popular press articles, and literary texts, our research is aimed at gaining insight into the historical prevalence of corporal punishment in Christianity, including thoughts for and against, and the relationship between corporal punishment legislation in varying regions of the United States and their corresponding religious climate. Results show that views on corporal punishment are varied amongst Christian sects. While many Christians advise for non physical means of punishment, conservative Protestants appear to show a much greater support for corporal punishment. This may be explained by their literal stance on the doctrine of the Bible, their view of the inherently sinful nature of mankind, and the necessity for punishment for these sins. Also, the acceptance of corporal punishment in

legislation appears to be positively correlated with the density of conservative Protestants, namely in the southeastern part of the United States.

Poster 44

Two Dimensional Photonic Crystal Analysis

Drew Schiltz, Georgia Institute of Technology

The overall goal of this research was to increase the light extraction efficiency of a ZnO scintillator using a 2D photonic crystal structure of air holes. Gaining a better understanding of photonic crystal functionality and design was crucial to the pursuit of this goal. Scintillation was modeled in Lumerical (FDTD Solutions), using a dipole source inside the ZnO crystal. Other analysis of the crystal structures was done in MIT Photonic Bands to obtain the band-structure of the photonic crystal. Using these two programs, the photonic crystal structure did result in an increased extraction efficiency of the scintillating crystal.

Poster 45

Modeling Electron Transport in Toroidal Carbon Nanotubes with Metallic Leads

Leon Durivage, Mark Jack, Mario Encinosa, Florida Agricultural and
Mechanical University

The interesting properties of carbon nanotubes allow for a wide variety of possible applications. One configuration in which the ends of a nanotube are connected to form a torus is interesting because of its unique electrical and magnetic properties. A program was written modeling the quantum electron transport of a carbon nanotorus with electric leads to study these interesting properties further. The program was later modernized and rewritten for modern computer infrastructures using parallel linear algebra libraries. As a result, the program models larger systems and allows for advanced modifications for future research.

Poster 46

Land Snail Community Diversity in the Driftless Region of Wisconsin

Christopher Lynum, Rachelle Amundson, Kathryn Perez,
University of Wisconsin - La Crosse

The terrestrial snails of North America are a diverse and threatened group, but conservation status of the majority of species is uncertain. There are ~100 species of land snails in Wisconsin and several habitats are known to have globally significant levels of land snail species richness, however, most are minute (<5 mm) and their distributions and

ecologies are poorly known. The survey of land snails in the Driftless region, an area free of ice during the last glaciations period, is being done not only to identify the locations of the 21 land snail species of conservation need but also to discover the variables driving land snail diversity and compare these variables in other regions to test the similarities with communities outside of the Driftless area. Georeferenced museum records were used to create a GIS model which incorporated sites with high gastropod richness with environmental information. Areas identified by the GIS model as highest priority were targeted for surveys along with a few low priority areas to ground-test the model. At each site there was a minimum 30 minute visual search for macrosnails and at least 2m² of leaf litter were gathered to sieve for microsnails. Environmental data such as slope, ground cover, and canopy cover were taken at each habitat in the site. The leaf litter was washed to remove sediment, air dried, and put through a series of sieves to separate coarse organic matter from the microsnails. After sieving, the litter is searched twice under a low-power dissecting microscope and the snails are collected, sorted, and identified to species. Currently, the dry, fine sediment is being picked through and snails are being identified. These surveys have resulted in discovery of several new populations and a large range extension for a state threatened species *Hendersonia occulta*, the cherrystone drop snail.

Poster 47

Iron Oxide/Gold Nanoparticles Arrays as Multimodal Imaging Agents

Jennifer Koezly, Evan Weitz, Valerie Pierre,
St. Mary's University of Minnesota

Magnetic Iron Oxide Nanoparticles (MIONs) are extensively used as contrast agents for in vivo MRI. Unfortunately, the low sensitivity (millimolar range) of MIONs and the low resolution (millimeter) of MRI limits the application of this class of imaging agents. Gold nanoparticles, on the other hand, are used extensively in cellular imaging techniques taking advantage of their plasmonic properties. Dark field spectroscopy, for instance, enables single molecule detection at the nanometer range. It would therefore be beneficial to synergistically couple the in vivo imaging capabilities of MIONs with the sensitivity and resolution offered by gold nanoparticles in a system that would remain biocompatible with low cellular toxicity. The synthesis of a ligand enabling dual functionalization of gold and iron oxide nanoparticles and its application in the self-assembly of multimodal and multimetallic nanoparticle arrays will be presented. The properties of the arrays and their efficacy as plasmonic and MRI contrast agents will be discussed.

Poster 48
Potential for Change-Lakeview Health Center
Michelle Sivanich, Viterbo University

Federal and State mandates have been responsible for the multitude of individuals who have relocated from state institutions to less restrictive environments, a process known as deinstitutionalization. As a result of this movement, most state-run institutions have closed. For the individuals remaining in Federal and/or State run facilities, their transition to a less restrictive environment has been complicated by their challenging behavior, along with the disability that causes it. This case study examined the preparatory methods implemented by staff to increase the success rates of such a move, as well as, described the impacts of a move as expressed by the literature. Addressing challenging behavior and acquisition of more adaptive behaviors are the central foci from which plans and preparations, for these individuals, could benefit. A knowledge base of interventions and services that can help prepare these individuals becomes important, so as to lessen the instances of future re-institutionalization.

Poster 49
Energy Use on a Small Organic Vegetable Farm in Rural Southwestern Wisconsin
Lauren Martin, Winona State University

The purpose of this project is to determine the energy “footprint” of Driftless Organics, a small organic vegetable farm in Crawford County, Wisconsin, and to examine approaches for making operations more sustainable. The carbon footprint will be determined by analyzing cost, usage, and type of energy used (i.e., electricity, natural gas, propane, diesel fuel, gasoline) for various on-farm and off-farm operations and activities. These include operating buildings and farm equipment, transportation of employees, equipment, and produce, deliveries of products to the farm, and efficiency of equipment (i.e., tractors, vehicles, cooling/heating systems). Once these have been documented, viable alternative practices such as solar power, energy efficient equipment, and alternative fuels will be examined and assessed for application to this specific farm operation. The desired outcome of this project is to improve the sustainability of Driftless Organics farm and reduce their carbon footprint by implementing alternative, energy-reducing systems.

Poster 50

Assessing Factors Underlying Species Invasion and Disease Transmission in the Upper Mississippi River

Allison Wood, Gregory Sandland,
University of Wisconsin-La Crosse

Invasive species are a critical concern, rapidly changing biotic systems throughout the world. The upper Mississippi River system recently has been plagued with an invasive aquatic snail, *Bithynia tentaculata*, which has spread from the Great Lakes and it, as well as the three exotic parasites it transmits, are impacting the ecological balance of the UMR. Our study sought to tease apart the factors underlying species invasion and disease transmission in the UMR through two approaches: field collections and laboratory experimentation. The first approach entailed field assessments of abiotic and biotic parameters potentially correlating with *B. tentaculata* colonization and infection. The second approach included a series of laboratory experiments aimed at evaluating the life history traits of the invasive snail and a common native snail (*Physa gyrina*). Field collections revealed that the invasive and native snail dominate at different sites, suggesting either direct or indirect factors mediate this pattern. To test this observation experimentally, we examined the effects of desiccation, a common phenomenon in the UMR, on two life stages of both *P. gyrina* and *B. tentaculata*. The results indicated that *P. gyrina* egg masses were more tolerant to a brief desiccation period (9 hours) than *B. tentaculata* egg masses as evidenced by the higher hatch rate of *P. gyrina* juveniles. Conversely, over a longer desiccation period (1 week), adult survival of *B. tentaculata* was much greater than that of *P. gyrina*. Although these results allude to an inverse advantage between these species at different life stages, *B. tentaculata* may exhibit a net advantage based on its ability to endure prolonged desiccation events at the adult stage. Together, these results suggest both natural and anthropogenic water level flux in the UMR may deplete native *P. gyrina* population, consequently facilitating *B. tentaculata* invasion and subsequent disease transmission.

Poster 51

The Effects of Familiarity and Size Class on Conspecific Choice

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Familiarity enables animals to discriminate between individuals with whom they regularly interact over an extended period of time. Previous studies have shown that in many taxa, individuals prefer to associate with familiar over unfamiliar conspecifics. Familiarity offers such benefits as heightened foraging abilities and increased predator detection and avoidance. However, previous studies disagree on the influence of the degree of familiarity on shoaling choice in fishes. Additionally, shoaling decisions may be based upon additional variables such as group size, gender, and body size. This study investigated female conspecific shoaling preference in the guppy, *Poecilia reticulata*, for either conspecific groupings of 1) a familiar female with an unfamiliar male, or 2) an unfamiliar female with

an unfamiliar male. Fish spent either 6 or 12 days in familiarity training. Neither 6 nor 12 day familiarity trained fish showed a preference for either familiar or unfamiliar conspecifics, therefore these data were pooled for the remainder of the study. In the pooled data it was found that smaller focal females showed a significant preference to shoal with groups composed of a familiar female and unfamiliar male. Larger focal females showed no significant preference for either grouping. The differences between large female and small female preferences may be due to the increased predation risk for smaller individuals or been a byproduct of age (smaller fish are younger than larger fish). This research suggests that body size along with familiarity may play an important role in shoaling decisions.

Poster 52

The Effects of Lauricidin/GML on TNF- α Production in Murine Macrophage Cells

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Lauricidin/GML has been shown to exhibit antiviral, antibacterial, and antifungal properties. Research has also shown that Lauricidin/GML may influence cells of the immune system by modulating T lymphocyte proliferation *in vitro* and cytokine production *in vivo*. For instance, *in vivo* studies have shown that Lauricidin/GML decreases production of the pro-inflammatory cytokine, TNF- α , which plays a significant role in a variety of diseases. The purpose of the present study was to analyze the effects of Lauricidin/GML on TNF- α production in RAW264.7 murine macrophage cells. Briefly, lipopolysaccharide (LPS) stimulated RAW264.7 cells were incubated in the presence or absence of various doses of Lauricidin/GML. TNF- α production was measured using a sandwich enzyme linked immunosorbent assay (ELISA: R&D Systems, Minneapolis, MN). Results indicated that on a per cell basis, Lauricidin/GML did not significantly decrease TNF- α production by RAW264.7 cells at the concentrations tested. This would suggest that Lauricidin/GML may influence TNF- α producing cells other than macrophages. Future experiments will be completed examining the effects of Lauricidin/GML on other cells of the immune system. Furthering our understanding of Lauricidin/GML is important since this chemical is a promising treatment option for individuals suffering from a variety of infectious diseases.

Poster 53

The Importance of Breast-feeding and Mother-child Attachment from the 1950's until today

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There has been much controversy surrounding the issue of whether breast-feeding is the appropriate choice of practice in infant care. The focus of this study was to utilize qualitative, archival research to identify the historical perceptions of breast-feeding from the 1950's to present-day. Each decade was analyzed for mother-child bonding, as well as the use of the term "attachment" and its implications on both baby and mother. The themes of breast-feeding and mother-child attachment differ from one decade to another. Throughout all the decades the research showed that breast-feeding was considered the most beneficial option in regards to health for both mother and child. The historical events and societal norms of each decade determined the differences between trends. While there have been significant societal changes, attachment remains one of the most important aspects of breast-feeding.