Program & Abstract

Student Research Day

UNK UNIVERSITY OF NEBRASKA KEARNEY

13th Annual
Nebraskan Student Union
April 7, 2011

CONTENTS

Sponsored by:

Office of Graduate Studies & Research
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SCHEDULE OF EVENTS
THURSDAY, April 7, 2011

7:30-9:00 a.m.	Poster Set Up	NSU 238
9:00-11:00 a.m.	Judging	NSU 238
Noon-1:30 p.m.	Luncheon Guest Speaker: Jay Powell	NSU 238 A&B
1:30-3:00.p.m.	Music Performance	NSU 238 C
1:30-3:30 p.m.	Oral Presentations	NSU 310 NSU 312 NSU 238 D
1:30-4:30 p.m.	Poster Session Open	NSU 238
3:30-4:30 p.m.	Award Reception	NSU 238 A & B
4:30 p.m.	Posters Removed	NSU 238

Luncheon Guest Speaker

Jay Powell

Dr. Jay Powell graduated from the University of Nebraska at Kearney with a Bachelor of Science in 2004. He majored in Computer Science and Mathematics, with a minor in Philosophy. He received a Master of Science in Computer Science from Indiana University in 2007 and earned a Ph.D. from Indiana University in February of 2011. His research work at Indiana focused on artificial intelligence and data mining. Jay has also worked at the United States Naval Research Laboratory under the Student Temporary Employment Program as a Computer Scientist. Following graduate school Jay began work at PerkinElmer in the research and development division in Downers Grove, IL. At PerkinElmer Jay works with software that interfaces with laboratory equipment designed to assist researchers in health and life sciences laboratories.

While a student at UNK, Jay spent four years developing software for Ward Laboratories, Inc., a local agricultural laboratory. Ward Laboratories has sold some of the software that Jay helped develop to domestic and international laboratories. Jay also delved into artificial intelligence research with Dr. John Hastings. This work, in partial collaboration with fellow students Brandon Hauff and Siva Kommuri, was presented at several top-tier national and international conferences. These conferences include the National Conference on Undergraduate Research (NCUR-05), the Nineteenth National Conference on Artificial Intelligence (AAAI-04), the Sixth International Conference on Case-based Reasoning (ICCBR-05), and the Twenty-First National Conference on Artificial Intelligence (AAAI-06).

Musical Performance Room 238 C

1:30 p.m.

Presenter: **Robert Roth**
Advisor: Darleen Mitchell
Title: *UNK Alma Mater*

The Alma Mater is the song that epitomizes the UNK experience. It has been sometime since our Alma Mater has been used, owing to its dated condition. It has existed in a men's choir arrangement and a hand-written SATB version. There was also a band arrangement, but like the vocal pieces, it was also very dated. My project has been to update the existing song for contemporary audiences. Exploring unique sonorities, while staying within the boundaries of the piece has been a part of the creative process. I have arranged it for SATB chorus and piano, orchestra, and band. Having it available for these three component ensembles will ensure its performance, making it therefore more readily accessible to the campus at large.

1:45 p.m.

Presenter: **Jillian Parker**
Advisor: Sharon O'Connell Campbell
Title: *Lotte Lenya Competition*

This year I competed in the Lotte Lenya Competition. This competition was established by the Kurt Weill Foundation for Music, honoring actress Lotte Lenya and her husband, composer Kurt Weill. Geared toward young singers/actors, this competition weighs the importance of dramatic and vocal interpretation as well as the contestant's singing ability. Repertoire for the competition must include one aria, a theatrical vocal selection by Kurt Weill, a piece from the Golden Age American musical theatre era, and an American musical theatre selection composed after 1968. To enter this competition I performed and video recorded my pieces. They were formatted onto a DVD and mailed to the Kurt Weill Foundation Headquarters in New York City, along with my application form. Today I will perform three of these selections, "I'm a Stranger Here Myself," by Kurt Weill, "Patterns" by Maltby and Shire and "Non piu mesta" from Rossini's opera La Cenerentola.

2:00 p.m.

Presenters: **Jordan Peterson and Amy Knispel, Ryan Hruza and Nate Rocke, Spencer Wolfe and Kassie Wendell, Natalie Burling and Kyle Kuypers**
Advisor: Janice Fronczak
Title: *KCACTF-Region 5 Irene Ryan Acting Competition*

Each year, students are competitively selected to represent UNK in the Kennedy Center American College Theatre Festival Irene Ryan Acting Competition. Each contestant and their partner must prepare two scenes and a monologue which are pre-

sented before a team of adjudicators. This year, over 360 contestants participated. Today's presentations reflect weeks of preparation from late fall through the competition in January. Four pair of UNK actors progressed to the semifinal round (64 competitors), and two pair advanced to the final round (12 competitors.)

2:15 p.m.

Presenters: **Katherine Ridder, Amber Kosmicki, Elizabeth Liebermann**

Participated in project: **Jordan Peterson, Addison Heeren, JoanAnn Blomstedt, Amy Knispel**

Advisor: Andrew White

Title: *West Central Regional NATS*

Each November, UNK Music students participate in singing auditions hosted by the West Central Region of the National Association of Teachers of Singing. These competitions feature both classical and musical theatre repertoire. Students compete according to gender and level of studio voice study. Each student participates in a preliminary round of competition with the possibility of advancing to semifinal and final rounds. Students may also attend workshops and master classes with national clinicians during the conferences. Today's presentations reflect repertoire of participants in the November 2010 auditions which were held at Colorado State University in Ft. Collins.

2:30 p.m.

Presenters: **Addison Heeren, JoanAnn Blomstedt, Codie Milford, Dillon Nelson**

Participated in project: **Jordan Peterson, Nate Rocke, Katherine Ridder**

Advisor: Anne Foradori

Title: *Midwest Theater Auditions*

The Midwest Theatre Auditions in St. Louis, Missouri hosts 60 summer theatre companies and over 600 collegiate actors, designers, and stage managers each year. In what is typically referred to as a "cattle call" in the theatrical world, actors have 90 seconds in which to perform an excerpt of a song and monologue in the hope that they will be hired for summer employment with a professional theatre. MWTA is one of the largest such events in the country, held over a three-day period. Actors learn many things from participating in this event. Including how to choose and cut audition materials, how to prepare an acting resume and professional "headshot", and how to interview in a second (callback) situation. Today's presentations of 90 second auditions demonstrate how an actor learns to think of his on her feet and make a positive impression in the blink of an eye!

Poster Presentations Ponderosa Room

Fine Arts & Humanities

Art

Presenter: **Thomas Dircksen (1)**
Advisor: Chad Fonfara
Title: *Steam Bending Wood*

This project is designed to gain an understanding about the process of steam bending wood. There are many factors that contribute to executing a successful bend and heat is the most important of them. The building of a steam box capable of retaining enough heat to perform a simple bend allows for further exploration into the art of steam bending.

English

Presenter: **Sada Hotovy (2)**
Advisor: Kathryn Benzel
Title: *Discovering Character with Sandburg: New Territory in Annotated Transcription*

This project began with transcribing and annotating one of Carl Sandburg's personal notebooks from the early 20th century. The project consisted of transcribing 138 pages of a handwritten notebook and then researching the context of Sandburg's notes and adding annotations, 30 pages of which are completed. The transcription and annotations revealed the types of experiences and literature that influenced Sandburg in his formative years after he left Lombard College (1904-1906) and gives insights to the creation of Sandburg's earliest published works, especially the little known poetry and prose in some of his earliest publications such as: In Reckless Ecstasy and Incidentals. This project is an exceptional opportunity for an undergraduate because the text is in such a primitive state and generally unavailable to researchers. Collaborating with my mentor, we prepared this document in an electronic format that not only makes it accessible to wider scholarship but also paves the way for use of other archived Sandburg materials.

Music

Presenter: **Brooke Harris (3)**
Advisor: Franziska Nabb
Title: *National Flute Association Collegiate Flute Choir*

The National Flute Association (NFA) holds an annual convention, in which members come together to share flute performances, presentations, and exhibits. The NFA also holds several competitions to select performers for various groups and solo performing opportunities. Brooke Harris auditioned by blind recording for the Collegiate Flute Choir and was one of seventeen undergraduate flute students from around the United States to be selected. The convention was held in Anaheim, California, from August 12-15, 2010. The NFA

Collegiate Flute Choir rehearsed under the direction of Dr. John Barcellona (Professor of Flute, California State University at Long Beach) during the convention and presented a concert on Sunday, August 15, 2010.

Philosophy

Presenter: **Eliot Wondercheck (4)**
Advisor: Tom Martin
Title*: Active Love Against Ivan's Madness*

In his novel The Brothers Karamazov, Fyodor Dostoevsky shows us a philosophical man buried deep in a philosophical problem. His name is Ivan, and his problem is famously perplexing, though perhaps not uncommon among the intelligentsia of his time—and, unfortunately, of ours. Like the Marxes and Nietszches who buried themselves beside him, he cannot find a way out. Unlike them, he knows he cannot find a way out. His problem, and his tomb, is his inability to find a reason to love those around him. But his problem is misplaced. With the help of a sentimental society woman named Madame Hohlakov, we may discover, along with Ivan, that it was never a philosophical problem at all. It was, and is for all men, a personal problem.

Behavioral & Social Sciences

Criminal Justice

Presenter: **Sarah Hille (5)**
Advisor: Julia Campbell
Title: *The Impact of Time on Accuracy of Eyewitness Testimony*

A controversial issue in the criminal justice field surrounds the accuracy of eyewitness testimony. Previous research has identified factors that impact a person's ability to properly recall a crime such as a person's gender and personality traits. Witness recall also may be significantly impacted by the passage of time. The purpose of this research is to evaluate the impact of time on the recollections of eyewitnesses to criminal offenses. The focus is on examining the longitudinal accuracy of participants' testimony over the course of an academic semester. Participants in this study were asked to recall in specific detail the circumstances surrounding a criminal incident over multiple interviews, in order to specifically assess the impact of time on the accuracy of eyewitness testimony. This research addresses a critical facet of the American court process, and contributes to our shared understanding of eyewitness testimony as a reliable form of evidence in criminal trials.

Presenter: **Jared Jensen (6)**
Advisor: Julia Campbell
Title: *Do Criminal Justice Students Fear Crime More than Non-Criminal Justice Students?*

While college students are less likely to be victimized than their peers not enrolled in college, recent incidents of mass violence on college campuses around the nation have brought this issue to the forefront. Fear of crime can influence students both positively and negatively. Fear can result in the employment of protective measures by students thereby lessening the likelihood of victimization. On the other hand, fear of

crime can erode a student's sense of well-being and quality of life. The purpose of this research is to examine the relationship between an undergraduate student's college major and their subsequent fear of crime. In addition, this research will evaluate the students' perceived likelihood of being a victim of crime on campus, as well as the self-protecting methods incorporated by students to lessen the chance of victimization.

Geography

Presenter: **Helen Breuer (7)**
Advisor: Jason Combs
Title: *Masdar City and Its Potential Influence on the World*

The present troubled state of our environment has countries around the world scrambling to find bigger and better ways to reduce their carbon footprints. In 2006, the United Arab Emirates (UAE) embarked on a radical approach to environmental conservation with the development of Masdar City, the world's first "green city." Members of the Abu Dhabi Future Energy Company (ADFEC) claim that Masdar City will produce no waste and be entirely powered by renewable energy. This project focuses on the planning, preparation, and construction involved with the ambitious operation paying special attention to the means by which the country plans to accomplish their objective and how other countries can apply this knowledge to their own efforts to go green.

Presenter: **Jacob McPhillips (8)**
Advisor: Jason Combs
Title: *Growth of the Catholic Church in Nebraska: From Rural to Urban*

The Catholic Church has had a role in Nebraska's growth as a state. It has helped to determine where people live and the nature, attitudes, and ideals people who live in those places. The Catholic Church in Nebraska is divided into three different dioceses; the Omaha Archdiocese, the Lincoln Diocese, and the Grand Island Diocese. Examining the geographical location of each and the type of growth or decline they have had is important. When it comes to observing these dioceses and the Catholic Church in Nebraska, population is a key element. To fully understand the Catholic Church's growth in Nebraska it is important to analyze the Catholic population and the number of churches, the abandonment and building of new churches, and the clustering, or consolidation of churches. All three of these levels of understanding the Catholic Church's growth will be examined in perspective to each of the three dioceses.

Presenter: **Andrew Miller (9)**
Advisor: John Bauer
Title: *A Comparison of Two Early Automobile Route Guides*

Automobile route guides were important precursors to the road maps that Americans are familiar with today. Unfortunately, little is known about them and few researchers have analyzed their roles in the history of cartography. Publishers claimed their routes were unique to only their copyrighted guides. This research investigates whether or not this claim was accurate and true. To answer this question, we carefully compared routes from the Official Automobile Blue Book with ones from Kings Official Route Guide. We used a GIS to identify which routes could possibly be coincident,

or the result of copying. We then compared these routes turn by turn, mile by mile, to see if they were the same. Overall, our conclusions are mixed. Some routes are exactly coincident, leading us to think that they could have resulted from copying. Others are mostly coincident, further questioning the publishers' claims. Other routes, however, are unique to only each specific guide.

Presenter: **Emily Stevens (10)**
Advisor: Jason Combs
Title: *Cold Weather and Recess*

With one of the coldest winters the United States has witnessed in years, schools across the country have been cancelling recess due the bitter temperatures. This project investigates the locations of schools and their recess and cold weather policies. Additionally, it explores cold temperatures at regional level. This includes the number of days the temperature is at or below 32 degrees. The comparison of recess cancellations in different regions demonstrates how schools policies are impacted by culture.

Presenter: **Kevin Ward (11)**
Advisor: Jason Combs
Title: *Population Change in the United States*

Every ten years, the United States Census Bureau tallies the population in the United States. By taking the statistical information collected by the Census Bureau, scholars track where people are moving to and with some in depth research can determine the reasons people are migrating to certain United States regions. On average, the total population of the United States has increased by 26 million in the last five decades, and some states like Nevada have increased by as much as 30 percent in population the past 50 years. By using census statistics, along with peer reviewed articles, the conclusion of where and why people are moving to certain parts of the United States is determined. Ethnicity, weather and climate patterns, driving conditions like construction and traffic, the economy and other aspects impact where people are moving to in the United States.

HPERLS

Presenter: **Lerrin Currie (12)**
Advisor: Erin Holt
Title: *Incorporation of Curriculum-Based Physical Activity Lessons to Meet Mandated Physical Activity Policy*

A Midwestern school district mandated a 20 -minute physical activity (PA) policy requiring teachers to provide PA to students outside of recess and physical education. Increasing PA time during the school day by integrating PA into lessons can help meet PA goals. PURPOSE: To determine if teachers incorporate curriculum-based PA (CB-PA) to meet a mandated PA policy. METHODS: 57 classroom teachers from 4 elementary schools completed a PA tracking sheet for 1-week determining implementation of the PA policy and incorporation of CB-PA. Teachers recorded duration and type of PA and subject of CB-PA. RESULTS: Teachers provided 20.59±8.68 minutes of PA daily. They used CB-PA 46.59% of the time, and accumulated 9.83±4.12 minutes during each session, commonly providing 2 sessions. Teachers frequently integrated CB-PA into language arts (47.8%) and math (39.2%). CONCLUSION: Incorporating CB-PA into the school

day has potential to provide students with one-third of the recommended amount of daily PA.

Presenter: **Charles Sepers (13)**
Advisor: Todd Bartee
Title: *From Theory to Practice: The Development of an Internet-Based Walking Program*

The internet has been gaining momentum in physical activity intervention delivery in recent years with mixed results. Process evaluation is an often over looked, but requisite component for developing effective internet-based, theory-driven programs. This presentation examines the planning, process evaluation, and delivery of two theory-based, 12-week walking program interventions; one demonstrating high theoretical fidelity and another that is theory-based, but outcome focused. These programs featured a partially automated data submission and goal setting algorithm method. Preliminary pilot testing demonstrated large effect sizes ($\eta 2p > 0.14$), for improved planning ($p = .05$), and improved program mastery ($p = .05$) among those in the high-fidelity condition. Process evaluation guided further methodological improvements including full automation of program components. The results of process evaluation data has allowed for the development of a much larger study to be conducted in the summer of 2012.

Political Science

Presenter: **Collin Grimes (14)**
Advisor: John Anderson
Title: *A Tale of Two Towns: The Emergence of Trust and Mistrust in Two Communities*

Trust is critical to civic and political life, but few have used a case study approach to explain either how it emerges or endures. Even fewer have examined the emergence of trust in small communities. This study uses high-low case matching and ethnographic and comparative historical research to explore the emergence and maintenance of trust and mistrust in two Nebraska towns. Findings support two principle conclusions: 1) trust and level of ethnic fractionalization at settlement are inversely related and 2) prosperity and economic equality maintain trusting social relations after its emergence.

Presenter: **Jared Krejci (15)**
Advisor: Joan Blauwkamp
Title: *House Committees and Leadership: Autonomy versus Collective Action*

The project seeks to explain how the majority party in the United States House of Representatives uses incentives and punishments to control congressional committees and to coax them into producing legislation that satisfies the majority party's legislative interests. This project expands on methods used by Cox and McCubbins and tests their hypotheses of committee control on new cases (1993).

This project studies three cases in which committee chairs were removed from power and seeks to determine whether the chairs were removed as a punishment for failing to enact legislation that favored the legislative interests of the majority party by analyzing committee support scores. The analysis supports the conclusions of Cox and McCubbins—that the majority party in the House of Representatives can rationally and effectively manage its committees. The

analysis also supports the idea that political and practical context is essential in understanding why committee chairs are removed from power.

Presenter: **Hayley Rudder (16)**
Advisor: Peter Longo
Title: *The Effects of School Consolidation on Rural Communities*

I examined the data and literature from school consolidated schools and the literature and data that linked rural sustainability to rural educational opportunities. I looked at Nebraska demographics and placed Greenwood, Nebraska (a town of 771), in this context. Lastly, I assessed the prospect for sustainability for Greenwood, NE

Psychology

Presenter: **Mackenzie Bohl (17)**
Advisor: Krista Forrest
Title: *The Effects of Reflective Journaling on Content Comprehension*

Teaching techniques in two sections of a large psychology lecture class at a university were examined in order to determine the effects of reflective journaling on content comprehension. Throughout the semester, the students that were enrolled in the course at the university were required to write four reflective journals. The journal topics related to the classroom material. The grade on the journals was coded through a scale based on Bloom's Taxonomy of Educational Objectives for the Cognitive Domain (Bloom, 1956). The score on the reflective journals was then compared with performance on corresponding exams and quizzes.

Presenter: **Shannon Bornhoft (18)**
Co-Presenter: **Ben Clancy**
Advisor: Joseph Benz
Title: *Cross-Culture Relationships*

This study examines the perception of relationships in different cultures. In this study we surveyed students in the Czech Republic and at UNK. the students from the US includes Caucasian, Hispanic, Japanese, and Chinese students. The survey asked student to rate 11 relationships scenarios (including love at first sight, opposites attracting, similarity, parental disapproval, etc.) on the likelihood of the relationship lasting, being in love, and success of the relationship. Czech students are significantly different than Caucasian and Hispanic students on several scenarios.

Presenter: **Shannon Foley (19)**
Advisor: Theresa Wadkins
Title: *Public Perceptions of Marital Counseling*

Because of the growing rate of divorce, we wanted to look at public perception of marriage counseling to see if couples are utilizing the tools they have available that can potentially save a marriage. Very little research has been conducted looking at public perception of marital counseling overall. Yet, there appears to be widespread belief that marital counseling is viewed negatively and therefore used only for individuals who have "serious" issues. Those who believe that counseling should only be used in extreme situations will not view or use counseling as a tool to keep a relatively stable marriage healthy. The purpose of the current study is to examine those perceptions about marriage counseling. We want to better understand what

people think, to determine how to encourage people to utilize marital counseling before the marriage becomes too unstable. Data was collected by participants completing an online survey. Implications will be discussed.

Presenter: **Sarah Hille (20)**
Co-Presenter: **Shannon Foley**
Advisor: Richard Miller
Title: *Effects of Empathy and Just World on Sentencing Recommendations*

Sentencing recommendations should be appropriate and not influenced by extraneous factors, although research has identified several biases including gender, age, and race. The purpose of this study was to examine the influence of empathy and Just World Orientation on sentencing recommendations. It was hypothesized that participants who strongly agreed with the Just World orientation would give a harsher punishment and that those participating frequently in the offenses from the scenarios, would administer a less harsh punishment. Participants reviewed scenarios containing five common infractions that college students are likely to have committed. Participants suggested an appropriate sentence for each offender. Participants were then asked to rate how often they have engaged in various offenses including the five infractions from the scenarios. We found that empathy (having engaged in a similar act) reduced the harshness of the recommended sentences and that Just World Orientation did not have an affect on sentencing recommendations.

Presenter: **Destinee Nelson (21)**
Co-Presenter: **Hannah Vontz**
Advisor: Krista Fritson
Title: *The Effects of Journaling on Self Efficacy and Course Engagement Among College Students*

It has been suggested that self efficacy and engagement are crucial in the development of personal growth, professional development, and learning. Previous research has indicated that journaling has been underused as a teaching and learning tool. However, very few researchers have explored how journaling affects college students' perceptions of their classroom engagement compared to classes when the students do not participate in journaling. The purpose of the present study is to determine if journaling in the classroom will significantly impact students' engagement in that class and their self-efficacy overall.

Presenter: **Kelli Oelsligle (22)**
Co-Presenter: **Jamie Brisbin**
Advisor: Wayne Briner
Title: *Antioxidant treatment alters behavioral and biochemical indices of depleted uranium treated mice*.

Depleted uranium (DU) is a heavy metal used in kinetic energy weapons by several militaries around the world. DUs release into the environments has raised concern over its radiologic and chemical toxicity. Animals exposed to DU demonstrate a variety of toxic effects, some of those being mediated by oxidative stress. This study tests the hypothesis that antioxidant administration will at least partially reverse the effects of DU exposure. To that end mice were administered either DU (75mg/L) or tap water and a control diet or a diet with ascorbic acid (3g/kg) and vitamin E (700IU/kg) for 2 weeks. Animals were tested on a variety of behaviors (open field,

light/dark box, water maze) and biochemical measures (lipid peroxidation and MTT measure of cell death). Our findings indicated that antioxidant exposure protects the liver and brain from lipid peroxidation. However, the kidney is not so protected. Anew finding also indicates that DU exposure directly correlates with MTT measures of cell death in the brain. These findings suggest that antioxidants may be a useful adjunct in treating individuals exposed to DU.

Presenter: **Hannah Vontz (23)**
Co-Presenter: **Mariah Ramold**
Advisor: Theresa Wadkins
Title: *Self-Reported Crimes by College Students: An Examination of Gender Difference*

We examined archival data to distinguish whether or not gender differences were significant in crimes self-reported by college students. Participants were asked to report any crimes they had engaged in since the age of 16. Out of the 87 offenses, 34 of them were found to be statistically significant in regard to gender differences when computed individually, with males showing higher rates of crime than females.

Social Work

Presenter: **Leanna Brase (24)**
Advisor: Jody Van Laningham
Title: *Effects of Religiosity on Young Adult Sexual Behavior*

The present literature review and data analysis examines the potential relationship between aspects of religiosity and sexual behavior in the late adolescent and young adult population. The focus of this analysis is on the effects of religious service attendance and the self-perceived level of religiosity on the number of sexual partners, frequency of sexual intercourse, and age at first intercourse among unmarried young adults ages 18 to 34. The data for this study are from The National Survey of Families and Households, a nationwide survey of adults. Results suggest that, in the majority of cases, religious service attendance and religiosity did appear to reduce the number of sexual partners and frequency of sexual intercourse. Findings also show that religious service attendance and level of religiosity also contributed to a lower age of sexual debut in this sample of young adults.

Presenter: **Heather Towndrow (25)**
Advisor: Tobi DeLong-Hamilton
Title: *Descriptive Analysis of Burnout in the Social Work Fields Using the Maslach Relationship to Work Inventory*

Burnout has clearly been shown to be an issue that many social workers face in the field of practice. When social workers experience burnout, their work becomes impeded and clients do not get the best they need. However, little research has been conducted specifically on social workers and burnout. The purpose of this study was to gather data about burnout in social workers and to analyze and compare collected descriptive data.

The focus of the research was to answer how high burnout rates are amongst social workers, what area of practice is most at risk, if there any differences between gender and their experience with burnout, and if burnout increases or decreases with years of experience and/or age. Utilizing Maslach's Relationships with Work Survey, 232

surveys were collected online from social workers across the United States, utilizing the Baccalaureate Program of Directors and National Association of Social Workers of Nebraska listservs. Sixteen questions were asked which assessed levels of emotional exhaustion, depersonalization, and professional efficacy. Twelve questions were added to the inventory which focused on participant demographic information. Overall, burnout rates were found to be low amongst social workers.

Natural & Physical Sciences

Biology

Presenter: **Anthony Bridger (26)**
Advisor: Keith Geluso
Title: *Nebraska Specimens of Amphibians and Reptiles in the University of Nebraska at Kearney (Kearney State College) Natural History Collection*

In spring 2010, we examined the holdings of amphibians and reptiles collected in Nebraska housed in the natural history collection at the University of Nebraska at Kearney, formerly known as Kearney State College. In our paper, we provide specific localities of occurrence for each specimen along with the number of individuals collected from each site. We found records for 358 specimens collected from the state and observed 317 individuals in the collection. Although two publications were published in 2010 regarding the distributions of herpetofauna in the state, we present 5 and 23 county records for the state, depending on the publication. Awareness of such specimens will further aid in the understanding of distributions for amphibians and reptiles in Nebraska.

Presenter: **Jeremiah Carlson (27)**
Advisor: Wyatt Hoback
Title: *Comparison of fall to spring captures of American burying beetle reveals sex and size biases*

The American burying beetle (ABB), Nocrophorus americanus, is a federally protected member of the Silphidae and is the largest member of the genus. It has a one year life cycle with adults emerging in June, finding appropriately sized carcasses and reproducing on these carcasses. The offspring of these parents emerge in August, search the environment for food and then overwinter until the following June. We compared the results from baited pitfall trapping in northern Nebraska in August 2009 and June 2010 to test sex ratios and pronotul sizes of adults. In August, significantly more female ABB (60% of 466) were caught while in June, sex ratios were equal for 620 trapped ABB. Compared to August, the male and female beetles caught in June the following year were significantly larger (9.73 versus 10.08 mm for males and 9.49 versus 9.92 mm for females). The results of this study indicate that the behaviors of American burying beetle and thus, trap ability differs by sex and season. Differences in size between August and June suggest that larger beetles survive overwintering better than smaller beetles and suggest that the overall large size of American burying beetle is important to their survival.

Presenter: **Ethan Cordes (28)**
Advisor: Kim Carlson
Title: *Differential Gene Expression Related to Nora Virus Infection of Drosophila Melanogaster*

Investigating the host relationships of certain viruses is useful for understanding, possible threats to human, animal, or plant heath. Nora Virus is a recently discovered RNA picorna-like virus that has been shown to produce a persistent infection in Drosophila melanogaster. Unfortunately, the regulation of the virus or the genes that the virus interacts with is unknown. In fact, very little is known about this novel D. melanogaster virus. With this in mind, we performed cDNA microarray analysis comparing the gene expression profiles of Nora Virus infected and uninfected wild-type D. melanogaster. This analysis yielded 57 genes having a 1.5 fold change or greater and p-value less than 0.01. Of these genes, 45 were significantly up-regulated and 12 were or down-regulated in response to infection. To validate the micronarray results, qRT-PCR was performed with probes for Chorion protein 16 (Cp16), which showed a three fold up-regulation on the microarray and Troponin C isoform 4 (TrpC4), which showed a three fold down-regulation. This genome-wide expression profile of Nora virus infection of D. melanogaster can pinpoint genes of interest for further investigation of antiviral pathways employed, genetic mechanisms, sites of replication, viral persistence , and developmental effects. Investigation the host relationships of certain viruses is useful for understanding possible threats to human, animal, or plant health. Nora virus is a recently discovered RNA picorna-like virus that has been shown to produce persistent infection in Drosophila melanogaster. The virus is of interest because it is similar to the picorna viruses that can cause human diseases and is infectious to a highly characterized model system.

The aim of our research was to observe the genome wide transcription effects of Nora virus infection on D. melanogaster. Microarray analysis comparing the gene expression of infected and uninfected flies indicates significant differences in gene expression using random variance paired t-tests. At a P value of less than 0.01, there were 12 genes down-regulated and 45 genes up-regulated at least 1.5 fold. To validate the microarray results, qRT-PCR was performed with probes for Chorion protein 16 (Cp16) and Troponin C isoform 4 (TrpC4). This genome wide expression profile during Nora virus infection can pinpoint genes of interest for further investigation of antiviral pathways employed, sites of replication, and developmental effects. The project described was supported by the NIH grant number P20 RR016469 from the INBRE Program of the National Center for Research Resources.

Presenter: **Mathew Day (29)**
Advisor: Janet Steele
Title: *Effects of Swimming Exercise on Glucose Tolerance in Diabetic KK-Ay Mice*

Diabetes is a heterogeneous metabolic disorder that is caused by desensitization of target cells to glucose or malfunctions in the secretion of insulin from pancreatic β cells. Due to these dysfunctions, diabetics experience a rise in blood glucose levels. Our study focuses on Type II diabetes because it is becoming more prevalent and is known to be caused by insulin resistance to target cells. Type II diabetes is also

linked to co-morbid diseases. Our study used KK-Ay mice, which are engineered to develop an onset of both obesity and diabetes. The mice were subject to rigorous physical activity through swimming. Swimming exercise was used to determine the effects that exercise has on increased glucose levels. The purpose of this study is to expand on results obtained by Chakraborty et al. (2009), which suggest diet alone lowers blood glucose levels. It is expected that exercise will significantly lower blood glucose levels the same as if not more than diet alone. Results will provide support for proper diabetes control and will provide background information for future studies testing for the effects that exercise and diet have on combating type II diabetes.

Presenter: **Alexandra Frohberg (30)**
Advisor: Mary Harner
Title: *Interacting Effects of Land Management and hydrology on bird communities along the Platte River*

The objectives of this study were to estimate bird abundance and species richness across pastures with different types of land management—burned and grazed, burned and non-grazed, and non-burned and non-grazed—and between sloughs and uplands within these pastures. Research was conducted in grasslands associated with the Platte River in central Nebraska in 2010. We counted a total of 528 birds of 22 different species. More birds were present on non-grazed pastures compared to grazed pastures and in sloughs compared to uplands. We did not detect a difference in species richness among management types or between sloughs and uplands. These results will help managers assess how land management activities may affect the abundance of birds in this riparian landscape.

Presenter: **Rachel Hall (31)**
Advisor: Kim Carlson
Title: *Effects on Longevity of Drosophila Melanogaster after Using Mutational Insertions to Knockout Genes*

Aging is the time-dependent decline in overall biological function as an organism progresses through life. By observing the absence of a gene that is highly up-regulated or down-regulated in relation to lifespan, it may be deduced that these certain genes have a direct effect on longevity. The purpose of this study was to determine if candidate aging genes directly affect longevity by knocking-out their functionality. Longevity assays were performed using Drosophila melanogaster strains with mutational insertions for the candidate genes neuropeptide-like precursor 3 (Nplp3) and CG4269, as compared to a the wild-type Canton-S strain. The longevity assays were performed until the last D. melanogaster died (63 days) and dead flies were counted every 3 days. Each treatment group was carried out in triplicate. Survival curves were created by calculating the percent of survival of D. melanogaster for each 3 day period. The assays suggest a decrease in lifespan in virgin flies with Nplp3 knocked out, and an increase in lifespan in mated flies with CG4269 knocked out. This implies that not only genotype, but also status of mating (virgin or mated) plays a role in longevity. Additional analyses using quantitative reverse transcription - polymerase chain reactions (qRT-PCR) are underway to

determine if genes involved in regulation of Nplp3 are cess. The project described was supported by the NIH grant number P20 RR016469 from the INBRE Program of the National Center for Research Resources.

Presenter: **Audra Kennedy (32)**
Advisor: Janet Steele
Title: *Influence of 5-Hour Engergy on the Spontaneous Physical Activity of Mice*

The energy drink industry is a multibillion dollar business annually. Manufacturers of energy drinks advertise an assortment of vitamins and energy supplements in their products that promise long-term energy as well as improved cognitive functions. Many, but not all, company claims about functions of the supplements in the drinks are somewhat supported by research. Manufacturers fail to note all possible effects that can arise from the usage of their products. Animal studies need to be conducted to note possible side effects as well as the amount of psychological effects versus physical effects of the energy drinks. We will use mice models to determine if energy drinks produce physical effects in the form of voluntary physical activity.

Presenter: **Travis Kirchner (33)**
Advisor: Dawn Simon
Title: *Characterization of Intron in Fungi*

There are two types of introns found in the rRNA of lichen-forming fungi, canonical group I introns and small insertions. The small insertions have been described as both spliceosomal introns and degenerate group I introns. This project aims to differentiate between these possibilities. The first aim is to compile rRNA introns from more than 3000 fungal sequences. From this assembly, we have found that introns occur in at least 150 discrete positions. Based on this compilation, potential insertions that represent the transition from group I introns to spliceosomal introns are being identified. The second aim of the project is to characterize splicing in a subset of these introns. Group I introns and canonical spliceosomal introns splice using different mechanisms, thus understanding splicing in potential intermediates may be important for understanding the transitionary stage. This work was funded by the INBRE Program (NIH P20RR016469) and the UNK Undergraduate Research Fellows Program.

Presenter: **Jennifer Merlino (34)**
Advior: Keith Geluso
Title: *Records of Cryptotis Parva and Sorex Merriami in Banner County, NE*

We present data on records for 2 species of shrews (Cryptotis parva and Sorex merriami) from western Banner County, Nebraska obtained from barn owl pellets. In 2010, sixty-seven owl pellets were collected from Banner County, Nebraska. We dissected pellets and identified the mammalian prey items, using cranium and dentary bones. We discovered 26 C. parva skulls inside the barn owl pellets. Our findings demonstrate that least shrews are more widespread in western Nebraska than previously known. We also found 3 skulls of Merriam's shrews that extend its range south from Dawes County, Nebraska and eastward from Albany County, Wyoming. Trapping with pitfall traps for all shrews in the panhandle of Nebraska and eastern Wyoming is warranted to increase knowledge of their distributions and habitat associations in the region.

Presenter: **Samantha Mitchell (35)**
Advisor: Kim Carlson
Title: *Production and Purification of OTK18 Protein to Determine Potential DNA Binding Regions*

OTK18 is a human transcriptional suppressor implicated as a regulator of immune system genes under homeostatic conditions. To date, the exact role of OTK18 protein and the promoter elements to which it binds under homeostatic conditions is unknown. This can be elucidated once full-length OTK18 is produced and purified, and the target OTK18 DNA binding sites are known. Therefore, full-length OTK18 with an N-terminal His tag was generated in the presence of protease inhibitors to both prevent the degradation of OTK18 and aid in purification. Western blot analysis of purified His-tagged OTK18 protein in the presence of inhibitors showed intact full-length OTK18 protein with minimal degradation. The purified OTK18 protein and candidate DNA binding regions are to be analyzed by gel shift assay to determine if binding occurs. The results of this study will characterize the OTK18 binding sites and insight into the elucidation of the organismal function of OTK18.

Presenter: **Ashley Nelson (36)**
Advisor: Mary Harner
Title: *The Presence of Chytrid Fungus in Bullfrogs along the Central Platte River*

Chytridiomycosis is a newly emerging disease in amphibians that was discovered in the late 1990s. It is hypothesized to be contributing to declines in amphibians globally. To date, it has not been documented in Nebraska. Our objective was to determine whether chytridiomycosis is present in amphibians along the Platte River in central Nebraska. In the summer of 2010, we surveyed three species of amphibians (American bullfrogs, leopard frogs, and Woodhouse's toads) in off-channel aquatic habitats at the Crane Trust, located in south-central Nebraska. We detected chytrid fungus in bullfrogs, and incidence of infection was very high (41% of adults surveyed). These results are of concern because bullfrogs are known carriers of the disease, often not becoming susceptible to the infection themselves, and are an invasive species in this region. Our study can help scientists and land managers better understand possible ongoing spread of this disease.

Presenter: **Jaicee Post (37)**
Advisor: Dawn Simon
Title: *Degeneration of a Plastid Group II Intron size biases*

Spliceosomal introns are ubiquitous in eukaryotes and make up nearly one-third of the human genome. Yet, their origins remain controversial. The leading hypothesis is that they arose from the degeneration of self-splicing mobile elements called group II introns. In this study we are examining the pattern of degeneration found in an exemplar group II intron located in the psaA gene of one class of red algae (Stylonematophyceae). The long-term goals of the project are to characterize structural and functional degeneration of this intron over evolutionary time. To do this sequence and structures of the intron from additional strains, as well as information about their self-splicing (function) ability are needed.

Thus far, we have partially sequenced psaA from two additional red algal strains and used phylogenetic analysis to verify their status as members of the Stylonematophyceae. In addition, one representative has been cloned and tested for self-splicing ability.

Presenter: **Andrew Prososki (38)**
Advisor: Kim Carlson
Title: *Production and Purification of Nora Virus ORF 3 Protein*

Nora virus is a single-stranded RNA and novel picorna-like virus able to infect Drosophila melanogaster in both naturally occurring and laboratory-evolved populations. It is unlike most other picorna-like viruses in that it has four open reading frames (ORFs), in contrast to one long ORF found in traditional picorna viruses.

To begin to characterize the site of replication and viral titers over time, protein studies utilizing a monospecific antiserum need to be performed. The purpose of this study was to generate monospecific antisera to Nora virus by cloning ORF3 in a solubility vector with an N-terminal His tag and to express the recombinant protein. The His-tagged recombinant Nora ORF 3 protein was purified and injected into mice to make monospecific antisera. The resulting antisera will be used for protein characterizations of Nora virus and it's relationship with D. melanogaster.

Presenter: **Jeff Shaw (39)**
Advisor: Dawn Simon
Title: *Fungal Diversity of a Cottonwood Root System*

Mycorrhizal fungi are symbiotic partners of plants that facilitate nutrient uptake. Cotton wood trees (Populus spp.) are a model system for studying mycorrhizal fungal diversity, as they harbor both ectomycorrhizae and arbuscular mycorrhizae. Furthermore, cottonwood roots extend several meters vertically and horizontally, intercepting soil layers that vary in texture, organic matter, and water content. We expect the assemblage of fungi to differ throughout this root network. We sampled eight distinct locations within the root system of a cottonwood tree and are using molecular techniques to assess diversity. DNA was extracted from four samples and a 1.4 kb region of the internal transcribed sequence and large subunit of the ribosomal RNA was amplified and sequenced. Preliminary comparisons of sequences within the root system will be discussed. This work was funded by the INBRE Program (NIH P20RR016469), the UNK Undergraduate Research Fellows Program and Research Services Council, and the Platte River Crane Trust.

Presenter: **Heather Wills (40)**
Advisor: Mary J. Harner
Title: *Shrewd Shrews Prefer Sloughs: A Look at Small Mammal Distribution in Response to Hydrology and Management*

Historically, prairies dominated landscapes across the Great Plains. Areas covered by prairies have declined mainly due to conversion to agricultural lands. Today, remnant and restored prairies are managed to introduce historical types of disturbances, such as grazing and burning. Topographic variation also exists in tall-grass prairies, notably presence of water-filled depressions known as sloughs. Shrews likely responded to greater cover and/or increased availability of insects in ungrazed, moister habitats. Our study provides insights on effects of

common management practices on small mammals and demonstrates the importance of sloughs within wet, tall-grass prairies.

Chemistry

Presenter: **Jill Abrell (41)**
Advisor: Michael Mosher
Title: *Lake Kearney: A Study of Urban Impact*

Water samples have been collected and analyzed from Lake Kearney over the past five months in order to determine the chemical content and overall health of the lake. Water was sampled in the canal so a comparison could be formed between chemicals found in the canal and those found in the lake. This would indicate whether chemicals were concentrating in the lake. Anthropogenic factors, such as housing and the golf course, were considered as possible human sources of chemical content.

Presenter: **Noah Broekemier (42)**
Advisor: Hector Palencia
Title: *Novel N-heterocycle carbenes-palladium complexes for the synthesis biaryls in aqueous solutions*

In this context the project interest lies on the development of active acidic catalysts that are able to convert non refined oil and animal fats into biodiesel under low energy consumption. Five different catalysts were synthesized and tested for a model reaction between oleic acid and methanol with encouraging results. These catalysts had been screened for the synthesis of biodiesel from vegetable with moderate yields. New catalysts are under development for the synthesis of biodiesel from alternative feedstock. The synthesis of catalysts and the results obtained for esterification and transesterification reactions will be discussed.

Presenter: **Noland Broekemier (43)**
Advisor: Hector Palencia
Title: *Synthesis of Bronsted Acid Catalysts for Esterification and Transesterification Reactions*

The esterification reaction is important for the synthesis of esters that are used in fragrances, flavors, polymers for industry, and bioenergy. Catalysts are key for the success of esterification and transesterification reactions. Recently, research efforts are focusing on the development of active catalysts that can convert renewable resources such as vegetable oil or animal fats into biodiesel. In this context the project interest lies on the development of active acidic catalysts that are able to convert non refined oil and animal fats into biodiesel under low energy consumption. Five different catalysts were synthesized and tested for a model reaction between oleic acid and methanol with encouraging results. These catalysts had been screened for the synthesis of biodiesel from vegetable with moderate yields. New catalysts are under development for the synthesis of biodiesel from alternative feedstock. The synthesis of catalysts and the results obtained for esterification and transesterification reactions will be discussed.

Presenter: **Taylor Carlson (44)**
Advisor: Annette Moser
Title: *Immunoextraction of Nicotine from Serum Samples using Magnabind® Beads to Create a Standard Curve for Nicotine Quantitation*

When measuring clinical serum samples, it is desirable to create a standard curve from 'blank' plasma samples. Unfortunately, small amounts of some compounds are naturally present in serum and prohibit the creation of a standard curve. One solution to this problem is to use immunoaffinity extraction coupled with magnetic bead technology to remove the undesired components from the serum prior to creating the standard solutions. Nicotine is a common compound found in human plasma even in nonsmokers. In this project, nicotine was stripped from human plasma using MagnaBind® magnetic beads coupled with an anti-nicotine antibody. Removal of the nicotine was verified by HPLC with UV-vis detection. Future work with this project will involve calculating the binding capacity, optimizing extraction conditions, and determining the number of times the Magnabind® beads can be regenerated.

Presenter: **Kelli Garwood (45)**
Advisor: Cheri Barta
Title: *Lanthanide-containing Pharmaceuticals: Chemical Bone Growth Agents for the use in Bone Fusion Surgeries*

Bone fusion procedures, such as total joint replacement surgeries and spinal fusion surgeries, are commonly used to treat medical Bone fusion procedures, such as total joint replacement surgeries and spinal fusion surgeries, are commonly used to treat medical conditions, such as chronic osteoarthritis and severe scoliosis. These types of surgeries, however, have only mediocre success rates, due to insufficient bone growth. Lanthanide metal ions, sharing many similar chemical properties with calcium ions, have been observed to exchange with calcium ions in bone tissue. Upon exchange, osteoblast activity was increased and osteoclast activity was inhibited, thus promoting bone growth. The design, synthesis, and characterization of six lanthanide-containing complexes will ideally be able to be used in the future to promote bone growth in bone fusion surgeries.

Cytotoxicity and cell proliferation studies on mus musculus osteoblast cells indicated that the six lanthanide-containing ligand complexes were not toxic to living cells and did indeed promote cell proliferation, thus possessing a possible future as bone re -growth agents in bone fusion surgeries.

Presenter: **Britni Hervert (46)**
Advisor: Hector Palencia
Title: *The Use of Organocatalysts in Sustainable Chemistry*

Sustainable chemistry searches for environmentally friendly methods that can perform chemical transformations under low energy consumption and reducing or eliminating the generation of waste, catalysts can be the key in these goals. Catalysts are promoters that achieve chemical transformations in short time and under mild conditions. There is a wide variety of catalysts and most of them are metal complexes. Organocatalysts are an important class of catalysts that can accomplish chemical transformations without the presence of metals, simplifying the purification or disposing of waste. In this project we will show that N-heterocyclic carbenes can be efficient organocatalysts for the synthesis of glycerol carbonate, a promising green solvent, and benzoin condensation of aldehydes. The key feature of the project is the development of catalysts that work with no heating and no solvent in short time,

saving energy and avoiding the generation of waste, in tune with the goals of Green Chemistry.

Presenter: **Rita Hood (47)**
Advisor: Michael Mosher
Title: *Progress Report on Dibenzacridines as G-quadruplex stabilizers*

The stabilizing of G-quadruplex structures in telomeric DNA is a viable target for anti-cancer therapy. The G-quadruplex is a single stranded region of DNA that is folded to form a relatively discrete binding domain. A series of G-quadruplex binding drugs has been designed to fit this domain. Their synthetic routes have been planned. Herein is described the synthesis of the Dibenzacridine cores that are to be used in this plan.

Presenter: **Benjamin White (48)**
Advisor: Frank Kovacs
Title: *Use of Chromatography to Characterize Substrate Binding Constant for a His-Tag Immobilized Enzyme*

The analytical chromatographic method of frontal analysis has been used successfully to measure binding constant for ligands to proteins. The typical method of protein immobilization for these studies is via a covalent linkage of the protein to a silica resin. In this work we have demonstrated that an enzyme-substrate binding constant can be measured using a Histidine tag to immobilize the protein which can be done in much less time. We have expressed the enzyme ascorbate peroxidase (APX) from switch grass with a His-tag and immobilized it on a Ni-NTA linked agarose resin. We then measured the binding of the enzyme with the substrate, ascorbate. Although no binding constants have been measured previously for switch grass APX, our measured value (Kd=11.4 ± 2.41) for switch grass APX corresponds well to those for APX from the literature (Kd = 11.6 ± 0.4).

CSIS

Presenter: **Tyler Adelung (49)**
CoPresenters: **Kelsy Bard, Luke Decker, Aaron Mitchell, Dan Farlin, Josh Beck, Dave Gangwish, Garrett Kearney, Ryan Levell, Wen Luo, Liang Liang**
Advisor: Sherri Harms
Title: *A-mazing Robots*

This project presents the results of robots navigating an atypical maze – an amaze. The objectives of this project were 1) understand the interplay between the physical design of a robot and the mental capacity of the robot in solving a problem; 2) experiment with various physical designs as well as mental, or algorithmic designs; and 3) compare the robotic designs by having them compete against one another. For this competition, we designed robots that attempt to navigate through two different amazes. On each attempt, a robot will be allowed a maximum of 7 minutes to navigate an amaze The robot that successfully navigating both amazes in the shortest combined time is the winner.

Presenter: **Kelsy Bard (50)**
Advisor: Sherri Harms
Title: *A Database Information System for Aviation Programs*

This research involves the analysis, design, and development of an FAA and TSA

compliant database information system to be used by the Aviation Systems Management Program at the University of Nebraska at Kearney. The goal of this project is to create a more reliable, user-friendly, and error-free system to store records of students enrolled in the program, along with instructor information, flight certificates, FAA courses, advising and assessment data, and TSA authorizations. An ideal system enforces data integrity, allows for a very small margin of error concerning data entry, is easily read and understood by many users, and allows for easy querying of individual students, as well as instructors, certificates, and records. The system stores personal student and instructor information, TSA registration and authorization forms, FAA course completion records, flight certification records, and advising and assessment data for at least five years after an individual has left the program.

Presenter: **Jason Webb (51)**
Advisor: Kenneth Trantham
Title: *Enabling Intuitive Control of 3-D Models Using an Accelerometer-Enabled Wristwatch*

In certain contexts, the standard keyboard and mouse interface constricts general computer users into a mode of interactivity that is not always optimal. One should not expect to interact as freely with a 3D model as they might with an e-mail application using a keyboard and mouse. Therefore, this poster will present a novel mode of interaction that utilizes a wirelessly-connected wristwatch computer, capable of measuring three-dimensional tilt of a user's hand, to intuitively rotate a 3D model on a computer display in real-time.

Geography

Presenter: **Austin Barenberg (52)**
Advisor: Vijendra Boken
Title: *Monitoring Pantanal Wetlands of Brazil Using Landsat Satellite Data*

Wetlands are very critical to the survival of many species and preserve the ecosystem. The Pantanal wetlands are largest tropical and freshwater wetland in the world. Most of the wetland can be found in the Brazilian state of Mato Grosso do Sul, and Mato Grosso, but part of the wetlands can be located in parts of Bolivia and Paraguay. The geographical extent of its dynamic area is estimated to be from 140,000 square km to 210,000 square km. The main objective of this project was to monitor change in the extent of this wetland over the past few years using satellite data. Wetlands were classified using an image processing system. All factors that affect the changes in water levels will be examined and the difference in wetland area between 1986 and 2007 will be discussed.

Presenter: **Ross Brunkhardt (53)**
Advisor: Jason Combs
Title: *Damages from the 1811-12 New Madrid Earthquake*

Earthquakes are caused by sudden movements of tectonic plates that release energy creating seismic waves. Seismic activity refers to the frequency type and size of earthquakes experienced over a period of time. Most Americans are familiar with California's San Andreas fault line and its continued seismic activity. As a result of that activity, California in recent decades has spent hundreds of millions of dollars repairing damages. Another fault line that is

gaining attention is the New Madrid fault. In the winter of 1811 the fault line slipped, resulting in the largest release of seismic energy in the continental United States. The New Madrid fault runs beneath four states—Arkansas, Kentucky, Missouri, and Tennessee. This project examines the devastation from the 1811 quake in that region and compares it to the potential consequences of a similar earthquake striking the area today.

Presenter: **Jennifer Linder (54)**
Advisor: Jason Combs
Title: *Tallgrass Prairie Restoration in Eastern Nebraska*

This research shows the ecological importance of prairie lands and the cycle that maintains the prairie ecosystem. A detailed explanation of the different methods of prairie restoration and why prairie restoration is important is provided. Public access prairie restoration sites in eastern Nebraska including seven sites maintained by the Nebraska Prairie Plains Resource Institute are studied. Research focuses on the destruction of the prairie, the importance of natural plant life, the cycle that maintains the prairie ecosystem and the importance of native plant species. Methods of prairie restoration such as grazing, planting of native grasses, and controlled fires are also considered. Mapping and aerial photography show Nebraska restoration sites and the type of restoration methods used. The findings demonstrate the important role prairies play as an ecosystem, from erosion control, to soil fertility and natural habitats. The planting of native grasses and controlled burnings maintain a healthy prairie and conservations efforts are aiding in the success of prairie restoration.

Presenter: **Ryota Tanaka (55)**
Advisor: Vijendra Boken
Title: *Monitoring Aral Sea using Landsat Satellite Data*

Remote sensing has the capability of monitoring a wide geographical area periodically and in a reliable manner. The Aral Sea has shrunk dramatically since 1960s. As a result, ecological system has changed. In this project, the objective was to monitor the change in the area of Aral Sea. During the period from 1980 and 2010, Landsat satellite data for different dates was downloaded and the area of the Area Sea determined using an image processing system.

Presenter: **Nicholas Volpe (56)**
Advisor: Vijendra Boken
Title: *Desertification modeling for the Rio Puerco Watershed using remote sensing techniques*

The Rio Puerco River Basin is suffering from erosion and desertification. Overgrazing is partly responsible for the land degradation. Landsat 4-5TM satellite imagery of the Rio Puerco watershed were used. Images starting from 1987 to the present provide a time lapse look at the watershed. Vegetation indices provide a quantifiable decay of vegetation conditions. Classification of the imagery depicts the regions undergoing degradation. Other remote sensing techniques are utilized to monitor desertification and show areas of high erosion risk. This work can be used in future erosion modeling projects.

HPERLS

Presenter: **Katlyn Heiserman (57)**
Advisor: Gregory Brown
Title: *Comparison of muscle activation in the rectus abdominis and rectus femoris between different foot positions during the use of an abdominal exercise weight machine in college aged females*

Strong abdominal muscles are necessary to maintain trunk and spine stability thereby reducing stress on the lumbar spine through the maintenance of correct posture and to prevent low back pain. Abdominal muscle strength is also necessary for successful athletic performance in many different sports. Abdominal muscles are commonly exercised by flexion at the trunk through a concentric muscle contraction, like that in a crunch or sit-up exercise. Activity of muscles which flex the hip should be inhibited as much as possible throughout abdominal exercise to prevent low back pain. The purpose of this study is to compare the EMG amplitude of the hip flexor and abdominal muscles during the use of a weighted abdominal exercise weight machine at different foot positions to determine which foot position is most beneficial in terms of activating the abdominal muscles while minimizing activation in the hip flexors.

Presenter: **Amy Long (58)**
Advisor: Scott Unruh
Title: *Bone Density and Its Relationship to Incidence of Injury in Collegiate Female Athletes*

Bone mineral density (BMD) is an important aspect of women's health. It is known that BMD increases throughout maturation and for a short time after and with some exercise. However, little is known about the affect of long-term participation collegiate athletics has on BMD, menstrual function (MF) and incidence of injury. Purpose: The purpose of this study is to determine if there is a strong correlation between BMD, body composition, MF and incidence of injury. Specifically, the intent is to evaluate the impact participation in collegiate athletics has on BMD over the duration of a collegiate athletic experience. Methods: To date, 121 female collegiate athletes aging from 18 – 23 at the University of Nebraska at Kearney (UNK) have voluntarily participated for one, two or three years. Subjects have participated in each of the sports that UNK offers for women. BMD and body composition was measured by dual-energy X-ray absorptiometry (DEXA). Height was measured using a seca standard stadiometer and weight using a Befour scale. Participants completed an initial and quarterly questionnaire regarding their menstrual function. Summative data on incidence of injury were calculated at the conclusion of each competitive year. Results: Preliminary results show mean whole body bone density equal to 1.24 ± 0.08 g/cm2 for 2008-09, 1.25 ± 0.09 g/cm2 for 2009-10 and 1.25 ± 0.09 g/cm2 for 2010-11. No correlation between whole body bone mass density and incidence of injury was indicated for the years of 2008-09 (r=0.04) and 2009-10 (r=0.12). Conclusion: The results indicate that whole body bone mass density is not a strong influence in collegiate women athlete's injury risk.

Presenters: **Ben Lentz, Krista Scheer, Sarah Siebrandt (59)**
Advisor: Gregory Brown
Title: *Wii, Kinect, and Move for Physical Activity*

Nintendo Wii was the first widely popular "physically active" video game system. In response, Microsoft has developed the XBOX Kinect. Sony has also developed the PlayStation Move, to compete with the Wii. Kinect uses no handheld controllers, but instead uses a camera to monitor a player's movements and convert the player's movement to on screen movements. Move uses handheld controllers and a camera to provide more precision in controlling on-screen movement. The purpose of this project is to compare physical activity in college aged adults using heart rate while playing Nintendo Wii Boxing, XBOX Kinect Boxing, and Move Gladiatorial Combat. Participants will first be evaluated for maximal aerobic fitness. Then, on another day, the participants will play Nintendo Wii Boxing, XBOX Kinect Boxing, and Move Gladiatorial Combat against a human opponent and against the game system opponent (8 minutes of gaming in each condition) while heart rate is monitored.

Presenter: **Bradley Peters (60)**
Advisor: Kate Heelan
Title: *Validation of Omron Pedometers using MTI Accelerometers with Children*

The need for a cost efficient and unobtrusive tool to measure physical activity in children is a priority for physical activity promotion. The MTI accelerometer is regarded as a valid, reliable, objective measure of physical activity in children; however, it is not always a practical instrument to use. The purpose of the current study is to validate Omron™ pedometer (steps per day) against MTI accelerometer (counts /day and moderate to vigorous physical activity (MVPA) per day) for children. 190 normal weight (n=78), overweight (n=42) and obese (n=70) children (88 males, 102 females, 8.7±2.1 yrs, 76.9±27.5 BMI %tile) wore a MTI accelerometer and Omron™ pedometer attached to the same belt for 3.9±2.2 days. Pearson correlation coefficients were used to determine validity coefficients between the devices. The correlation between Omron™ steps/day with MTI counts/day and MVPA/day were r=0.79, and r=0.72 ($p<0.05$), respectively. Our results suggest that the Omron™ pedometers are an acceptable method for physical activity measure in children.

Presenter: **Krista Scheer (61)**
Co-Presenters: **Sarah Siebrandt, Ben Lentz**
Advisor: Gregory Brown
Title: *Physically Active Video Games*

The term "physically active video game" seems like an oxymoron, yet there are numerous video gaming systems that are currently advertised to promote physical activity and enhance physical fitness. Nintendo Wii, Microsoft XBOX Kinect, and Sony PlayStation Move are all "physically active" home video game systems. The purpose of this research project is to measure the changes in ventilation elicited by playing Nintendo Wii Boxing, XBOX Kinect Boxing, and Move Gladiatorial Combat against a human opponent and against the game system. Participants will first be assessed for respiratory rate, tidal volume, and minute ventilation during a graded exercise test, and then on a separate day the same measurements will be made while the participants play the video games for 8 minutes under each condition (Nintendo

Wii Boxing, XBOX Kinect Boxing, and Move Gladiatorial Combat against a human opponent and against the game system).

Presenter: **Sarah Siebrandt (62)**
Advisor: Gregory Brown
Title: *Oxygen Consumption in Interactive Video Games*

With the introduction of the Nintendo Wii, the concept of a Physically Active home video game system has been realized. However, playing Nintendo Wii only results in light to moderate physical activity and there are numerous "tricks" that can be used to reduce physical activity while still playing the Wii. Sony has recently introduced the PlayStation Move gaming system and Microsoft has introduced the XBOX Kinect gaming system. The Kinect and move are second generation physically active home gaming systems with more advanced motion sensitive control of on-screen game play. The Kinect and Moved are supposed to be less prone to non-physically active trickery, and thus more physically active than Nintendo Wii. The purpose of this project is to measure oxygen consumption and energy expenditure when playing Nintendo Wii Boxing, XBOX Kinect Boxing, and Move Gladiatorial Combat for eight minutes against a human opponent and against the game system.

Presenter: **Krista Zarybnicky (63)**
Advisor: Kate Heelan
Title: *Changes in Metabolism based on Breakfast Consumption*

In recent years, the media has indicated breakfast consumption may jumpstart ones metabolism and therefore assist with weight maintenance. PURPOSE: To determine whether breakfast consumption influences resting metabolic rate (RMR) among college students. METHODS: Ten college students (5 males, 5 females, age: 21.20 ± 0.79 years) volunteered to participate. Subjects had their RMR measured on two separate occasions, once after breakfast and once fasted. A paired t-test was conducted to analyze differences between RMR measured following breakfast consumption and fasted RMR. RESULTS: Resting metabolic rate was 2207.60 ± 370.35 kcal/day after breakfast. Resting metabolic rate measured in a fasted state was 2047.30 ± 369.34 kcal/day. CONCLUSION: These results suggest that consuming a breakfast of 520 calories increases resting metabolic rate significantly ($p<0.01$). Previous studies suggest that an individual who consumes breakfast tends to eat less throughout the day. Their weight loss occurs as the result of the increased satiety and decreased intake of calories throughout the remainder of the day.

Math

Presenter: **David Hayes (64)**
Advisor: Aaron Clark
Title: *Continued Construction and Testing of a Distributed Computing Environment*

Continuing the project we started last year, Dr. Clark and I over doubled the processing power and memory of our distributed computing environment. Additionally, this year, we benchmarked the environment using the HPC Challenge; it is the standard benchmarking software for MPI based clusters. We are using our cluster to run code Dr. Clark has written to simulate radiative transfer through clouds. The results, although in their infancy, are very promising. As a tangent to this years research, I have been working on code to break simple encryption schemes. The hope is that it can eventually be implemented on the cluster.

Physics

Presenter: **Carl Corder (65)**
Advisor: Liubov Kreminska
Title: *The Investigation of Optical Vortices and Hexagonal Patterns in Three Plane Wave Interference*

We demonstrated that optical vortices can be created by means of interference of three waves from a common laser source. Different patterns can be generated starting from common two wave interference fringes up to regular hexagonal structures. Experiment supported our theoretical and numerical results.

Presenter: **Adrian Sanabria-Diaz (66)**
Advisor: Timothy Reece
Title: *Modeling Nonvolatile Memory Elements based on Ferroelectric Polymers*

We used the computer simulation program Matlab to model memory elements based on ferro-electric polymers. Equations based on previous hyperbolic tangent or tanh functions were used to model the hysteresis of ferro-electrics. This model allowed us to predict the operation conditions like minimum voltage needed. In addition, the model allowed us to optimize parameters for real world applications like desired thin film thickness.

Presenter: **Jason Teten (67)**
Advisor: Liubov Kreminska
Title: *Characterizing and Describing Light Waves*

In this project we were able to reconstruct the phase of a laser beam. By doing this we were able to explore optical vortices and phase singularities. I was able to complete this by using an experimental lab setup and computer programs. I had a modified Mach-Zahnder Interferometer set up that allowed me to conduct the experiment. By doing this I was able to successfully reconstruct the phase of the laser which shows great examples of optical vortices. I am also starting to explore how light waves behave when they are diffracted by a plane. Here we are hoping to see that the diffraction field we create will be represented as a super position of real obtainable light waves.

Professional & Applied Science

Business Management

Presenter: **Megan Faust (68)**
Co-Presenter: **Phillip Boon**
Advisor: David Palmer
Title: *Increasing Competitiveness in the Area Job Market*

This study investigates the pertinent characteristics that human resource managers from the area's largest companies typically seek from recent UNK graduates. With the help of surveys, we will take a sample of select area companies and determine what they find most important in a student's resume. Further, answers to questions concerning interview attire, references, and social media will be examined. When all interview results have

been compiled, a set of recommendations will be made for students wishing to increase their competitiveness in the area's job market.

Industrial Technology

Presenter: **Stephen Carlson (69)**
Advisor: Tim Obermier
Title: *Internet Service Across Nebraska*

This research project was done to compare the cost for internet across the state of Nebraska by comparing the cost per Megabyte between the different city classes as defined by Nebraska legislation.

Family Studies

Presenter: **Meaghan Hill (70)**
Advisor: Toni Hill
Title: *The Impact of Social Media*

My poster will display the impact of social networks on today's society. I'm not just talking about Facebook, but every aspect of social media, Email, Twitter, etc. To narrow down the aspect of this research topic it is going to be about the fast pace of information transferred between people through a social media. For example, how fast people find out about a pregnancy, engagement, death, birth, etc. through social media.

Graduate Poster Presentations

Biology

Presenter: **Amanda Fields (71)**
Advisor: Julie Shaffer
Title: *Currency as potential vector for Stappylococcus Aureus*

Staphylococcus aureus is a potentially pathogenic bacterium that can cause fatal infections. This is especially true of antibiotic resistant strains, such as methicillin-resistant S. aureus (MRSA). Traditionally healthy, young individuals without known risk factors are showing increased rates of infection. It is becoming increasingly important to determine vectors of this serious pathogen to reduce the risk of exposure and contamination. The aim of this study is to collect US paper currency from a local hospital and examine the bills for the presence of S. aureus and MRSA. Of the 100 bills we collected so far, 67 bills were positive for S. aureus, and 15 exhibited methicillin resistance. We will continue to collect samples to determine if the number of S. aureus colonies increase during the flu season, providing a potential source of infection for the increase in MRSA-influenza co-infection related deaths.

Presenter: **Monluedee Luecha (72)**
Advisor: Keri Farnsworth-Hoback
Title: *Genetic variation of isopods in Nebraska*

Monluedee Luecha, Kate Kneeland, Kerri Farnsworth-Hoback, W. Wyatt Hoback and John E. Foster

Isopods are important invertebrates because they decompose organic matter and increase the soil nutrition by excreting feces containing microbes, which help in speeding up the decomposition process. All terrestrial isopods in North America are believed to be exotic species introduced and distributed with soil ballast and agricultural aesthetic plantings. Little is currently known about dispersal and population isolation in species of isopods, including Armadillidium vulgare, a very commonly encountered species. This study assessed the genetic variation among four isopod populations of A. vulgare collected at rest areas on Interstate 80, which runs east/west in Nebraska. The CTAB method was used to extract DNA, and amplified fragment length polymorphism (AFLP) techniques were used to compare populations. The results indicate the occurrence of genetic variation among these populations. These results are important for understanding dispersal ability and adaptation to local environments, such as in Nebraska where precipitation declines east to west.

Counseling & School Psychology

Presenter: **Keller Batterman (73)**
Co-Presenter: **John Wehrbein**
Advisor: Max McFarland
Title: *Using Aims Web Math Curriculum Based Measurements as a Predictor for the Measures of Academic Progress Standardized Test*

With the passage of the No Child Left Behind Act (NCLB) in 2002, annual standardized tests became mandatory in the Public School Systems. This study looks at using Math Curriculum Based Measurements to predict how a student will perform on the standardized MAP test in third, fourth, and fifth grades. Additionally, this study looks is there are multiple predictors at each of these grade levels. This study provides information to educators looking for help monitoring student performance on future MAP tests.

Presenter: **Dani Butterfield (74)**
Co-Presenter: **Jayme Davis, Melissa Burrows, Melissa Gochenour, Casey VanZandt, Joel Lemus, Trish Holen, Liz Sizer, Crystal Vinderslev**
Advisor: David Hof
Title: *Counselors: Making a Difference Wherever You Are Through Community Engagement*

Student members of Upsilon Nu Kappa and faculty traveled to the Pine Ridge Reservation to further develop an ongoing partnership with reservation residents by co-constructing advocacy initiatives to address the mental health needs of reservation

youth. Pine Ridge is one of the poorest reservations in the US with also the highest incidences in mental health issues, especially among youth. In addition to reservation based activities, social media was used to initiate ongoing dialogue with youth about needs and empowerment strategies to promote self advocacy as well as identify appropriate counselor assisted interventions. By attending, participants hoped to become better prepared to serve the mental health needs of Native American youth and improve outlook of the counseling profession. Information provided will include pictures, quotes, and descriptions of the experience that illustrate participant training, an overview of the social media experience, reservation-based experiences, and qualitative themes from participants' reflections will be shared.

Presenter: **Kelsey Van Dusen (75)**
Advisor: Max McFarland
Title: *NASP Accredited Education Specialist Programs vs. Non NASP Accredited Education Specialist Programs*

The birth of the National Association of School Psychology (NASP) in 1969 strengthened the field of school psychology and it was established to support practitioners in the field. Through the development of this organization, very specific practitioner standards and training program accreditation requirements have been established. In an article by Fagan and Wells (2000) they quote Chernay and note "accreditation is defined as a system for recognizing educational institutions and professional programs affiliated with those institutions for a level of performance, integrity and quality which entitles them to the confidence of the educational community and the public they serve". (Chernay, n.d., p.1; Fagan & Wells, 2000, p.28). Accreditation is an important way for educational institutions to assure quality education for its students. In order to maintain consistency in their accreditation standards, NASP created 11 domains of training, they include; 1) data-based decision making, 2) consultation and collaboration, 3) effective instruction and development of cognitive/ academic skills, 4) socialization and development of life competencies, 5) student diversity in development and learning, 6)school and systems organization, policy and development, 7)prevention, crisis intervention and mental health, 8) home/school/community collaboration, 9) research and program evaluation, 10)school psychology practice and development, 11) information technology. These are the domains of training and resulting competencies that programs must address, assess and attain in order to receive national approval and recognition from NASP. School psychology program accreditation is a major symbol of professionalism that helps to establish the field on a par with clinical and counseling psychology (Fagan & Wise, 2007).

HPERLS

Presenter: **Cody Flower (76)**
Advisor: Kate Heelan, Todd Bartee
Title: *Parental Satisfaction of a BMI Report Card Program*

The increase in childhood obesity has initiated the use of Body Mass Index Report

Cards (BMI-RC) to inform and educate parents of their child's weight status. It is important to understand parents' knowledge and perceptions of the BMI-RC to determine the effectiveness of the report.

Purpose: To evaluate parent satisfaction of BMI-RC.

Methods: Body mass and height were measured for 2,559 elementary school-aged children (grades K-5). BMI (kg/m²) was calculated, and BMI percentile was determined based on age and gender by the Centers for Disease Control and Prevention. BMI-RC were distributed to parents of all elementary students providing their child's weight status, explanation of the results, helpful tips for healthy eating and physical activity, and community resources. Following BMI-RC distribution, parents were sent a 13 question survey to gauge their satisfaction and perception of child's weight status which is currently being analyzed.

Performance Presentations Room NSU 238 C

1:30 - 1:45 Presenter: **Robert Roth**
Advisor: Darleen Mitchell
Title: *UNK Alma Mater*

1:45 - 2:00 Presenter: **Jillian Parker**
Advisor: Sharon Campbell
Title: *Lotte Lenya Competition*

2:00 - 2:15 Presenters: **Jordan Peterson & Amy Knispel;**
Ryan Hruza & Nate Rocke;
Spencer Wolfe & Kassie Wendell;
Natalie Burling & Kyle Kuypers
Advisor: Janice Fronczak
Title: *KCACTF - Region 5 Irene Ryan Acting Competition*

2:15 - 2:30 Presenters: **Katherine Ridder, Amber Kosmicki, Elizabeth Liebermann**
Participated in project: **Jordan Peterson, Addison Heeren, JoanAnn Blomstedt, Amy Knispel**
Advisor: Andrew White
Title: *West Central Regional NATS*

2:30 - 2:45 Presenters: **Addison Heeren, JoanAnn Blomstedt, Codie Milford, Dillon Nelson**
Participated in project: **Jordan Peterson, Nate Rocke, Katherine Ridder**
Advisor: Anne Foradori
Title: *Midwest Theater Auditions*

Oral Presentations - Room NSU 238 D

Economics

1:30 - 1:45 Presenter: **Roy Machamire**
Advisor: Frank Tenkorang
Title: *The Analysis of Small Business Economic Standing in Kearney, NE, 2007-2009 Recessionary Period*

English

1:45 - 2:00 Presenter: **Sada Hotovy**
Advisor: Kathryn Benzel
Title: *Discovering Character with Sandburg: New Territory in an Annotated Transcription*

Music

2:00 - 2:15 Presenter: **Anthony Ward**
Advisor: Darleen Mitchell
Title: *The Role of Music in 2001: A Space Odyssey*

Sociology

2:15 - 2:30 Presenter: **Mandy Yendra**
Advisor: Diane Kholos-Wysocki
Title: *Internet Personals: How Men Socially Construct Themselves Based on Who They are Seeking*

Political Science

2:30 - 2:45 Presenter: **Danielle Larson**
Advisor: Peter Longo
Title: *Whiteclay: Historical Underpinnings of Political, Social and Legal Injustice*

2:45 - 3:00 Presenter: **Brennon Malcom**
Advisor: Peter Longo
Title: *Free Speech at Military Funerals*

Graduate History

3:00 - 3:15 Presenter: **Amber Alexander**
Advisor: Mark Ellis
Title: *The Fairmont Army Field*

Economics

3:15 - 3:30 Presenter: **Alexandra Zysset**
Advisor Frank Tenkorang
Title: *Investor Sentiment*

Oral Presentations - Room 310

Biology

1:30 - 1:45 Presenter: **Travis Claybrooks**
Advisor: Julie Shaffer
Title: *Beetle Juice! Characterization of Antimicrobial Proteins in Nicrophorus Carolinus*

Chemistry

1:45 - 2:00 Presenter: **Bobbi Stromer**
Advisor: Frank Kovacs
Title: *Characterization of Ascorbate Peroxidase of Switchgrass*

HPERLS

2:00 - 2:15 Presenter: **Charles Sepers**
Advisor: Todd Bartee
Title: *From Theory to Practice: The Development of an Internet - Based Walking Program*

2:15 - 2:30 Presenters: **Ben Lentz, Krista Scheer, Sarah Siebrandt**
Advisor: Gregory Brown
Title: *Wii, Kinect, and Move for Physical Activity*

Sociology

2:30 - 2:45 Presenter: **Laura Ahlman**
Advisor: Stephen Glazier
Title: *A Plea for Authority: The King James Only Movement And 1970's Conservatism*

Graduate Biology

2:45 - 3:00 Presenter: **Christopher Uphoff**
Advisor: Casey Schoenebeck
Title: *Sexual Size Dimorphism and Rensch's Rule among Yellow Perch Populations*

Biology

3:00 - 3:15 Presenter: **Jess Lammers**
Advisor: Wyatt Hoback
Title: *Following Directions: A Test of Burying Beetle Navigation to Traps Using a Modified Pitfall*

Oral Presentations - Room 312

Physics

1:30 - 1:45 Presenter: **Joshua Beck**
Advisor: Liubov Kreminska
Title: *Polarizing Efficiency of Thin Films of IR806*

1:45 - 2:00 Presenter: **Jeremy Stromer**
Advisor: Liubov Kreminska
Title: *Image Analysis of Liquid Crystal Polarizers*

Psychology

2:00 - 2:15 Presenter: **Emily Kubalik**
Advisor: Richard Miller
Title: *Individual and Social Factors that Influence Self-Concept Resiliency*

2:15 - 2:30 Presenter: **Destinee Nelson, Kyle Brandyberry**
Advisor: Krista Forrest
Title: *The Effects of Interrogator Gender and Personal Space Violation on False Confessions*

2:30 - 2:45 Presenter: **Adrianne White**
Advisor: Krista Forrest
Title: *Laypersons' Interrogation Prototypes: Can Police Detect Suspect Legal Experience from Interrogation Descriptions?*

Social Work

2:45 - 3:00 Presenter: **Stephanie Klein**
Advisor: Maha Younes
Title: *The International Adoption Experience*

3:00 - 3:15 Presenter: **Cheri Theesen**
Advisor: Tobi DeLong-Hamilton
Title: *Grief Patterns in Family Caregivers for those with Dementia*

3:15 - 3:30 Presenter: **Austin Wilson**
Advisor: Maha Younes
Title: *Dating Violence Among College Students*

Oral Presentations

Biology

Presenter: **Travis Claybrooks**
Advisor: Julie Shaffer
Title: *Beetle Juice! Characterization of Antimocrobial Proteins in Nicrophorus Carolinus*

Carrion beetles (Coleoptera: Silphidae) are part of a vast army of organisms that recycle organic waste back into the environment. There are two subfamilies in North America. Silphinae species feed openly on decaying carcasses and developing maggots. By contrast, Nicrophorinae species bury carcasses as part of a reproductive strategy in feeding their larvae. Like many Nicrophorus species, *Nicrophorus carolinus* saliva contains antimicrobial proteins that prevent bacterial decomposition of the small animal carcasses used to feed their larvae. The hypothesis is that the character of the *N. carolinus* proteins is similar to those in *N. marginatus*. Primary objectives included in characterizing the antimicrobial proteins in *N. carolinus* and then comparing them with those in *N.marginatus.* First, the salivary proteins were separated using size exclusion HPLC. Fractions containing the active antimicrobial protein were then identified using a Microtox machine. Bioluminescent bacteria was added to each sample and the luminescence in each sample was measured at 5 and 15 minute intervals. A decrease in the luminescence in a sample indicated antimicrobial activity. Once the active fractions were identified, the proteins were isolated using isoelectronic focusing gels. Then the active samples were freeze dried and sent for amino acid composition and sequencing. Once the proteins are characterized they will be compared to the *N. marginatus* proteins. Future research will include synthesizing the antimicrobial proteins and testing them against various bacterial microbes including some harmful to humans.

Presenter: **Jess Lammers**
Advisor: Wyatt Hoback
Title: *Following Directions: A Test of Burying Beetle Navigation to Traps using a Modified Pitfall*

The biology of burying beetles (Coleoptera: Silphidae) outside of the carrion trap is not well understood; however, the numbers of Nicrophorus decline with habitat disturbance and are low when areas are used for row crop agriculture. Members of the genus find small vertebrate carcasses by detecting the odor of decay. After detection, the beetles are assumed to fly upwind to the source and beetles can travel more than 3.5 km in a day in search of carrion. Among the silphids, the American burying beetle, Nicrophorus americanus, has been eliminated from more than 90% of its historic range and is federally protected. Identifying critical habitat for this species is a major goal of its recovery plan. We modified a standard bucket trap to have four quadrants with a bait cup to test whether beetle catch could be associated with a direction. The dividers in the trap were set to the cardinal directions. Traps were set in areas that had suitable habitat (wildlife area or open range) in one direction and poor habitat (rowcrops) in another direction. A Chi-squared

goodness of fit test showed a statistical difference in numbers of beetles collected among quadrants. There was a strong preference for the north facing sections of the trap even when these quadrants corresponded to agriculture fields. Refining trap design may allow determination of the direction from which beetles come to the trap and allow a more precise determination of high quality habitat while providing additional information on burying beetle foraging behavior.

Chemistry

Presenter: **Bobbi Stromer**
Advisor: Frank Kovacs
Title: *Characterization of Ascorbate Peroxidase of Switchgrass*

The unique nature of lyotropic chromonic liquid crystals lends themselves to a variety of applications. One application of note is the use of lyotropic chromonic liquid crystals as linear polarizers. Our research is concerned with the development of a thin film polarizer using a particular lyotropic chromonic liquid crystal, the near-infrared dye IR-806. Thin films were produced with a pneumatic shearing device using differing concentrations of dye. The main focus of this project was the development of a method for analysis of thin film liquid polarizers. Pictures of the polarizers were taken under a polarizing microscope with a CCD camera. An algorithm for analyzing the intensity of the light in each image was written in MATLAB and then images were then inputted into this algorithm for analysis. This allowed for a new graphical approach for determining the quality of the polarization of our films. We were able to compare the efficiency of the liquid crystal polarizers with commercial polarizers.

Economics

Presenter: **Roy Machamire**
Advisor: Frank Tenkorang
Title: *The Analysis of Small Business Economic Standing in Kearney, NE, 2007-2009 Recessionary Period*

Analysis of small business economic standing in Kearney, Nebraska during the 2007- 2009 recessionary period, and also the measures they took in place to keep their doors open. Also, analyzing the effects of the recession on the business marketing strategies, human resource strategies, and also management strategies.

Presenter: **Alexandra Zysset**
Advisor: Frank Tenkorang
Title: *Investor Sentiment*

The purpose of this research project is to determine the influence of investor sentiment on the level of investment. Investor sentiment is the confidence that an investor has in the financial institution or system he or she is considering. The impact of investor sentiment on overall investment will be discerned through linear regression. Linear regression will enable investor sentiment's influence to be separated from that of the other factors of investment. This project is particularly relevant concerning the recent recession and what role investor sentiment has played. Since much effort through the recession had been focused on restoring lost investor sentiment, this project will help determine whether or not the effort was warranted.

English

Presenter: **Sada Hotovy**
Advisor: Kathryn Benzel
Title: *Discovering Character with Sandburg: New Territory in an Annotated Transcription*

This project began with transcribing and annotating one of Carl Sandburg's personal notebooks from the early 20th century. The project consisted of transcribing 138 pages of a handwritten notebook and then researching the context of Sandburg's notes and adding annotations, 30 pages of which are completed. The transcription and annotations revealed the types of experiences and literature that influenced Sandburg in his formative years after he left Lombard College(1904-1906) and gives insights to the creation of Sandburg's earliest published works, especially the little known poetry and prose in some of his earliest publications such as: In Reckless Ecstasy and Incidentals. This project is an exceptional opportunity for an undergraduate because the text is in such a primitive state and generally unavailable to researchers. Collaborating with my mentor, we prepared this document in an electronic format that not only makes it accessible to wider scholarship but also paves the way for use of other archived Sandburg materials.

HPERLS

Presenter: **Charles Sepers**
Advisor: Todd Bartee
Title: *From Theory to Practice: The Development of an Internet-Based Walking Program*

The internet has been gaining momentum in physical activity intervention delivery in recent years with mixed results. Process evaluation is an often over looked, but requisite component for developing effective internet-based, theory-driven programs. This presentation examines the planning, process evaluation, and delivery of two theory-based, 12-week walking program interventions; one demonstrating high theoretical fidelity and another that is theory-based, but outcome focused. These programs featured a partially automated data submission and goal setting algorithm method. Preliminary pilot testing demonstrated large effect sizes ($\eta 2p > 0.14$), for improved planning ($p = .05$), and improved program mastery ($p = .05$) among those in the high-fidelity condition.

Presenter: **Ben Lentz, Krista Scheer, Sarah Siebrandt**
Advisor: Gregory Brown
Title: *Wii, Kinect and Move for Physical Activity*

Nintendo Wii was the first widely popular "physically active" video game system. In response, Microsoft has developed the XBOX Kinect. Sony has also developed the PlayStation Move, to compete with the Wii. Kinect uses no handheld controllers, but instead uses a camera to monitor a player's movements and convert the player's movement to on screen movements. Move uses handheld controllers and a camera to provide more precision in controlling on-screen movement. The purpose of this project is to compare physical activity in college aged adults using heart rate while playing Nintendo Wii Boxing, XBOX Kinect Boxing, and Move Gladiatorial Combat. Participants will first be evaluated

for maximal aerobic fitness. Then, on another day, the participants will play Nintendo Wii Boxing, XBOX Kinect Boxing, and Move Gladiatorial Combat against a human opponent and against the game system opponent (8 minutes of gaming in each condition) while heart rate is monitored.

Music

Presenter: **Anthony Ward**
Advisor: Darleen Mitchell
Title: *The Role of Music in 2001: A Space Odyssey*

My presentation would border on performance in that I wish to show certain scenes from 2001 and discuss the role and impact of the music in those particular scenes. To illustrate my point, I wish to play the scenes without music or with different music to demonstrate the different emotional and psychological impacts within these scenes. I would also discuss the personal involvement we have with music, and the fact that without this personal, introspective involvement the film loses meaning and potency

Physics

Presenter: **Joshua Beck**
Advisor: Liubov Kreminska
Title: *Polarizing Efficiency of Thin Films of IR806*

The scattering of light, which passed through a thin film of IR806, was measured using an optical setup and a polarized light source. IR806 is a lyotropic chromonic liquid crystal substance that has been developed into thin films by fellow researchers. The light scattering was examined at many different angles of polarization. This was done using LabView as well as other computer environments to adjust the setup and take measurements, which were then stored directly to a computer for further analysis. The data, collected from several samples of different concentrations by mass, was then examined in order to determine if thin films of IR806, an LCLC, made an effective polarizer and how it compared to current commercial polarizers.

Presenter: **Jeremy Stromer**
Advisor: Liubov Kreminska
Title: *Image Analysis of Liquid Crystal Polarizers*

The unique nature of lyotropic chromonic liquid crystals lends themselves to a variety of applications. One application of note is the use of lyotropic chromonic liquid crystals as linear polarizers. Our research is concerned with the development of a thin film polarizer using a particular lyotropic chromonic liquid crystal, the near-infrared dye IR-806. Thin films were produced with a pneumatic shearing device using differing concentrations of dye. The main focus of this project was the development of a method for analysis of thin film liquid polarizers. Pictures of the polarizers were taken under a polarizing microscope with a CCD camera. An algorithm for analyzing the intensity of the light in each image was written in MATLAB and then images were then inputted into this algorithm for analysis. This allowed for a new graphical approach for determining the quality of the polarization of our films. We were able to compare the efficiency of the liquid crystal polarizers with commercial polarizers.

Political Science

Presenter: **Danielle Larson**
Advisor: Peter Longo
Title: *Whiteclay: Historical Underpinnings of Political, Social, and Legal Injustice*

This paper presents an overview of the history of Whiteclay, Nebraska. Recognized nationally for the prevalence of alcohol and its effects on the nearby Pine Ridge Indian Reservation, Whiteclay is often thought of as a modern problem. A review of this town's history shows this is not the case. Problems first recognized in the late 1800s have remained unaddressed. Injustices perpetuated throughout history in the political, legal, and social spheres will be discussed.

Presenter: **Brennon Malcom**
Advisor: Peter Longo
Title: *Free Speech at Military Funerals*

This presentation will examine the Respect for America's Fallen Heroes Act (RAFHA) passed in 2006 by U.S. Congress that prohibits disruptions during military funerals held on federally managed property. The presentation will use recent court decisions and law review articles to form a thesis that the act is and will be judged constitutional.

Psychology

Presenter: **Emily Kubalik**
Advisor: Richard Miller
Title: *Individual and Social Factors that Influence Self-Concept Resiliency*

This study examined the relationship between self-concept resiliency (how difficult it would be to change an aspect of self-concept) and individual and social factors. We examined the effect of false feedback on the resiliency of two specific components of self-concept, an individual's personality and values. Participants completed both personality and values inventories and received false feedback on one dimension of the personality and values inventories. A self-concept change scale assessed their acceptance of the false feedback. Participants also completed a self -concept clarity scale.

Presenter: **Destinee Nelson**
Co-Presenter: **Kyle Brandyberry**
Advisor: Krista Forrest
Title: *The Effects of Interrogator Gender and Personal Space Violation on False Confessions*

Previous research has found that a confession is seen as the single most incriminating piece of evidence presented to a jury, even with eyewitness testimony and physical evidence present. Judges, juries, and the general public commonly believe that suspects will only confess if truly guilty. A specific suspect behavior during interrogation that has recently received a lot of interest in research is the false confession. Another portion of the study is to distinguish if there is an optimal distance for each gender and interrogations as a whole. For the present study, the experimental procedures utilized in Kassin & Kiechel's will be replicated, except we will use male and female interrogators. Thus, the purpose of this study is to determine if male and female participants' confession and internalization rates differs as a function of interrogator gender and proximity.

Presenter: **Adrianne White**
Advisor: Krista Forrest
Title: *Laypersons' Interrogation Prototypes: Can Police Detect Suspect Legal Experience from Interrogation Descriptions*?

Individual factors contributing to suspect behavior during interrogation include personality characteristics (Gudjonsson, 2003; Gudjonsson, Sigurdsson, Bragason, Einarsson, & Valdimarsdottir, 2004); low levels of intelligence (Gudjonsson, 2003); younger age (Gudjonsson, 2003; Redlich & Goodman, 2003); mental illness (Redlich, 2004), substance abuse (Sigurdson & Gudjonsson, 2001), and suspect innocence (Kassin, 2005). Despite an increasing literature addressing individual factors, we know little about the effects of a suspect's expectations for and knowledge of interrogation processes. Nor do we know how capable police officers are of detecting suspects' knowledge of law enforcement when arrest records are not immediately available. This two-part study first addresses potential suspects' schemas for interrogations. Second we examine the extent to which individuals with law enforcement experience are able to distinguish law enforcement familiarity in descriptions of participants with low and high levels of experience with interrogation.

Social Work

Presenter: **Stephanie Klein**
Advisor: Maha Younes
Title: *The International Adoption Experience*

A literature review on international adoption and a presentation of future plans for a research project. Taking a look at the previous research done on international adoption about the experiences and challenges of internationally adopted children.

Presenter: **Cheri Theesen**
Advisor: Tobi DeLong-Hamilton
Title: *Grief Patterns in Family Caregivers for those with Dementia*

This research examines the grief process of family caregivers of those with Dementia. The Alzheimer's Association (2010) reported an estimated 10.9 million unpaid dementia caregivers, who were largely family members. With this prevalence of unpaid caregivers it is important to explore grief and its impact on the caregiver. Gaining a clearer understanding of the role and level of grief in family caregivers will assist in developing support and coping interventions for these caregivers. Using the Marwit-Meuser Caregiver Grief Inventory (2002) to survey a sample of Alzheimer's Association support group attendees in Nebraska, the results of this study identifies the symptoms and levels of grief experienced. This presentation will discuss factors of grief for family caregivers as well the influence of family support groups.

Presenter: **Austin Wilson**
Advisor: Maha Younes
Title: *Dating Violence Among College Students*

The intent of this research was to explore the prevalence of dating violence among college students. Research indicates that twenty-five percent of female students experience intimate partner violence, which has become a common concern among college students in general. More

specifically, this study explored dating history and initial exposure to dating violence, the types of violence experienced, victimization and perpetration factors, acceptability, coping skills, awareness and use of support services, prevention, and help-seeking behaviors. The outcome of the review reveals the sad reality of dating violence, the shame that victims feel, and their under utilization of services that are aimed at helping them to problem-solve their situation.

Sociology

Presenter: **Laura Ahlman**
Advisor: Stephen Glazier
Title: *A Plea for Authority: The King James Only Movement and 1970's Conservatism*

The controversy as to how to best translate the Bible has existed almost as long as the scripture itself. Fear that improperly translating scripture would somehow taint the holy word sparked a refusal by early Christian churches to produce biblical texts in the vernacular. Currently, a similar, but more complex controversy exists within the Christian community. A subculture of Christian fundamentalist has banded together to call for the authority of the King James Bible. Two men, David Otis Fuller and James Jasper Ray, are credited with starting in the movement in the early 1970. However, writings by advocates of the King James Bible have existed since the early 1930s. In this study, I look at the social construction of the King James Only Movement in order to explain why 1970s America provided the perfect time and place for the movement to flourish.

Presenter: **Mandy Yendra**
Advisor: Diane Kholos-Wysocki
Title: *INTERNET PERSONALS: How Men Socially Construct Themselves Based On Who They Are Seeking*

This content analysis of Craig's List participants will investigate both sexuality and internet usage. Using the personal ads In Craig's List under "Men Seeking Men", and "Men Seeking Women", I will find out how the ads differ based on whom they are looking for. Principles of sex, gender, and sexuality will be addressed. The methodology will include the review of eight states, with a sample of eighty randomly picked advertisements. I will be looking not only at what they say they are seeking, but also photos to measure differences.

Graduate Studies Oral Presentations

Biology

Presenter: **Christopher Uphoff**
Advisor: Casey Schoenebeck
Title: *Sexual Size Dimorphism and Rensch's Rule among Yellow Perch Populations*

Predicted and observed mean lengths at age were used to describe sexual-size dimorphism (SSD) of yellow perch across a broad geographic range. Predicted mean lengths at age were significantly greater for female yellow perch after age-3 indicating female-biased SSD upon maturity. Using observed

mean lengths at age, 10 of the 11 study populations had at least one year class where females were significantly larger than males and two-thirds of the individual year class comparisons were represented by female biased SSD. Sexual-size dimorphism could not be predicted using yellow perch population dynamics or lake morphometry, however SSD could be predicted using lake productivity. The SSD among these yellow perch populations also exhibited an allometric relationship known as Rensch's rule, where the magnitude of SSD decreases with increasing body size in species that exhibit female-biased SSD. This study demonstrates the likely presence of female-biased SSD in the majority of yellow perch populations across the study area.

History

Presenter: **Amber Alexander**
Advisor: Mark Ellis
Title: *The Fairmont Army Air Field*

The Fairmont Army Air Field was one of eleven airfields established in Nebraska during World War II. Its short life had significant social and economic impacts on the residents of Fillmore County. Land was seized from local farmers for the airfield. The large influx of construction workers, military personnel, and their families created housing shortages. Numerous civilians were employed and local businesses prospered. Local residents helped improve soldier morale by hosting dinners, dances, and opening the Geneva USO. Volunteers aided at the hospital, which was the largest in Nebraska at the time. Many friendships and marriages developed. Several soldiers returned to the area after the war to raise families. Along with the good, several residents witnessed traumatic airplane crashes making the war real. The Fairmont Army Airfield brought prosperity to an area stricken by the Great Depression and left local residents with memories of the vibrant times of its operation.

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