

17<sup>TH</sup> ANNUAL

University of Nebraska at Kearney

# Student Research Day

APRIL 15, 2015

Program & Abstract Booklet



# SCHEDULE OF EVENTS

Wednesday, April 15, 2015

7:30 am to 9:00 am .....Students set up posters in Ponderosa Room of the Nebraskan Student Union

9:00 am to 11:00 am.....Poster Judging

12:00 pm to 1:15 pm .....Luncheon with Guest Speaker, Megan Dethlefsen, Pharm. D

1:30 pm to 3:30 pm .....Oral Presentations & Performances  
.....Open Poster Session

3:30 pm .....Awards Ceremony & Reception



DO RESEARCH. FEED YOUR TALENT.  
RESEARCH NOT ONLY WINS THE  
WAR ON CLICHÉ, IT'S THE KEY TO  
VICTORY OVER FEAR AND ITS  
COUSIN DEPRESSION.

— ROBERT MCKEE





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# GUEST SPEAKER

## Megan Dethlefsen, Pharm. D

Dr. Megan (Nelson) Dethlefsen is a Pharmacist and Clinical Coordinator for Pharmacy Services at CHI Health-Creighton University Medical Center. Megan is a 2006 graduate of UNK where she received her Bachelor of Science degree in Biology (Summa Cum Laude). Megan received her Doctorate of Pharmacy (conferred with High Distinction) from the University of Nebraska Medical Center in 2010. After pharmacy school, she completed a general pharmacy practice residency at the Veterans Affairs – Nebraska/Western Iowa Healthcare System in 2011.

As a pharmacy student, Megan's area of research focus was on the delivery of healthcare to indigent populations. She was a student board member and pharmacy chair of the SHARING Clinic, a student-run safety net clinic in Omaha. Megan completed research on the control of diabetes using a modified consensus algorithm for care in the indigent population. As a pharmacy resident, she continued research in the control of diabetes and hypercholesterolemia in the veteran population. As part of her Clinical Coordinator duties at CHI Health-CUMC, Megan acts as an Investigational Pharmacist, which keeps her involved in clinical drug trials. She also precepts students from Creighton University's School of Pharmacy and Health Professions and pharmacy residents at CHI Health-CUMC, which includes teaching and mentoring them on possible research projects.

At UNK, Megan completed research on characterizing the antimicrobial compounds in the oral secretions of *Nicrophorus marginatus* under the guidance of Dr. Julie Shaffer in the Department of Biology. She presented her research at Nebraska Academy of Sciences, and was the recipient of the Senior Research Award from the Department of Biology in 2006. Megan's research experience at UNK opened her eyes to the importance of research, not only for contributing new information but also for personal growth. She is especially grateful to the professors who make Bruner Hall their home for providing such a great foundation for success in the healthcare setting.



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# POSTER ABSTRACTS

## Fine Arts and Humanities



( 2 )

**Presenter – Brooke Butterfield**  
**Co-Presenters – Emily Feters, Stormy Chesmore, and Brian Spencer**

Department: English

Advisor: Dr. Jessica Hollander

Title: *Environmental Visual Argument 2*

From environmentally-friendly changes mandated by companies and government to the hype and hypocrisy surrounding the consumer-based “green movement,” we see current trends of Environmentalism both exploited and ignored without knowing the true benefits and harms to our society and our world. This group of students has created a rhetorically-rich visual argument to expose one misrepresentation or oversight of environmentalism, or “The Green Movement,” and illustrate why it is problematic.

( 3 )

**Presenter – Julianna Burr**  
**Co-Presenters – Michael Jones, Kendra Schiermeyer, and DaCarlos Humphrey**

Department: English

Advisor: Dr. Jessica Hollander

Title: *Environmental Visual Argument 5*

From environmentally-friendly changes mandated by companies and government to the hype and hypocrisy surrounding the consumer-based “green movement,” we see

## English

( 1 )

**Presenter – Shannon Betts**  
**Co-Presenters – Gabrielle Paczosa, Myles Sudbeck, and Gianna Demiranda**

Department: English

Advisor: Dr. Jessica Hollander

Title: *Environmental Visual Argument 4*

From environmentally-friendly changes mandated by companies and government to the hype and hypocrisy surrounding the consumer-based “green movement,” we see current trends of Environmentalism both exploited and ignored without knowing the true benefits and harms to our society and our world. This group of students has created a rhetorically-rich visual argument to expose one misrepresentation or oversight of environmentalism, or “The Green Movement,” and illustrate why it is problematic.

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**( 4 )** **Presenter – Megan Cherry**

Department: English

Advisor: Dr. Denys Van Renen

Title: ***Robert Louis Stevenson: Dualism and Fusion in the Victorian Era***

Author and writer Robert Louis Stevenson articulates the topic of dualism within his literary works. Dualism influenced Stevenson all his life, starting with his roots in Scotland. While Scotland joined with England to form the United Kingdom in 1707, it differs considerably from its neighbor England. Stevenson remarks on socio-political and cultural difference between the poor Scottish Highlanders and wealthy English Lowlanders through his characters. The Highlander characters seek adventure and represent traditional ideals—they want to keep intact their culture--while the Lowlander characters represent commercial and worldly practices. This duality intersected with the Victorian Era in interesting ways; the idea of, “what it means to be a gentleman.” But the question in Stevenson’s works is, what makes a gentleman? Is it his active life or his fortune? English Lowlanders chose fortune while Scottish Highlanders were defined by their active lives, even if their neighbors to the south thought of them as poor and wild. At times, Stevenson represents how these characters shared characteristics, adventures,

hardships and family blood. I propose to depict this duality in both Stevenson’s novels as well as in the artwork of the period.

**( 5 )** **Presenter – Mathew Dietz**  
**Co-Presenters – Kayla Francis, Kennedy Schaefer, and Destiny Garcia**  
Department: English  
Advisor: Dr. Jessica Hollander  
Title: ***Environmental Visual Argument 1***

From environmentally-friendly changes mandated by companies and government to the hype and hypocrisy surrounding the consumer-based “green movement,” we see current trends of Environmentalism both exploited and ignored without knowing the true benefits and harms to our society and our world. This group of students has created a rhetorically-rich visual argument to expose one misrepresentation or oversight of environmentalism, or “The Green Movement,” and illustrate why it is problematic.

**( 6 )** **Presenter – Natalie Hall**  
Department: English  
Advisor: Dr. Megan Hartman  
Title: ***Epicene Pronoun Usage in Common Speech Patterns***

The history of the epicene pronoun in English is long, varied, and complicated. An epicene pronoun is a singular, third-person pronoun that does not have a clearly gendered referent, as in the following example: Someone left his keys in the car. Because "someone" is an indefinite referent, it lacks a clearly defined gender, making "his" an epicene pronoun. Many linguists and grammarians have

suggested a myriad of strategies or solutions for solving the problem, such as recasting the sentence and using generic she, he or she, or a pronominal neologism. Over time, though, none of these options have proven to be a truly effective way of filling the epicene pronoun gap because we still are searching for a solution. In this project I found that the common speech patterns of Americans indicate that generic "they" is the most commonly used epicene pronoun in informal speech. For my research methodology, I developed a brief oral survey of common speech patterns and gave the survey to a varied demographic. Participants were asked to respond to two open-ended prompts and then complete a short gap-fill exercise. This study builds upon previous work I have completed in this area, and the data gathered in this survey has been added to my previous research findings. Combining the data from this survey and my previous research, my conclusions are that generic "they" is the most common epicene pronoun in speech patterns, "he or she" is an unnatural construction found more prominently in written than spoken communication, and traditional gender associations are still attached to previously gendered words (i.e. lawyer and teacher).

**( 7 ) Presenter – Rachel Nozicka**

Department: English

Advisor: Dr. Denys Van Renen

Title: *Labor and the Shifting Perception of Personal Property in Jonathan Swift's "Gulliver's Travels"*

Jonathan Swift's satire, Gulliver's Travels, produced an intricate social commentary on the 18th century. Through his novel, Swift considers the shifting conceptions of labor during the early 1700s. Work itself becomes a

form of private property for Gulliver; he works to enhance his sense of identity and property-holdings. Knowledge also becomes a form of private property for him, a device that will enable him to rise in the social classes. By transforming his views about personal ownership, Gulliver becomes very self-centered and abnormally preoccupied with his body and self-preservation. In his corrupted sense of private property and family relations, Gulliver rejects the sense of shared wealth in a family and only works to further his own interests. In doing so, he loses touch with the community of his "members" and essentially exiles himself from his own species. His disdain of his kin alienates him from the happiness he has the potential to achieve if he applies the lessons he has learned from traveling to improve his familial relationships. In the end, Gulliver has worked for happiness but cannot envision it in a situation where he must work harder for himself and others in order to achieve that happiness. Therefore, Gulliver fails to recognize what Swift and readers alike can see clearly: Labor, when used appropriately for the proper reasons, can help in the journey to happiness. However, when labor is abused, people can come to incorrect conclusions about happiness and the need for property in order to reach happiness, thereby effectively preventing themselves from achieving a true understanding of happiness and its role in labor and relationships.

( 8 )

**Presenter – Aleesha Olena**

**Co-Presenters – Rachel Tweedy, Teresita Medrano, and Teautla Zimmerman**

Department: English

Advisor: Dr. Jessica Hollander

Title: *Environmental Visual Argument 3*

From environmentally-friendly changes mandated by companies and government to the hype and hypocrisy surrounding the consumer-based “green movement,” we see current trends of Environmentalism both exploited and ignored without knowing the true benefits and harms to our society and our world. This group of students has created a rhetorically-rich visual argument to expose one misrepresentation or oversight of environmentalism, or “The Green Movement,” and illustrate why it is problematic.

## Modern Languages

( 9 )

**Presenter – Alecia Friedel**

Department: Modern Languages

Advisor: Dr. Chris Jochum

Title: *Investigating the SIOP Model and Marzano Framework in ELL Classrooms*

The purpose of this study is to provide a continuation or extension of my previous projects: Summary and Analysis of the SIOP Model and Investigating the SIOP Model in Elementary Classrooms: A Multiple Case Study. In both projects, I analyzed the use and effectiveness of the Sheltered Instruction Observation Protocol (SIOP) Model in ESL, or English as a Second Language, programs and in mainstream classrooms. As a future

elementary educator with an emphasis in ESL instruction, I realize the importance of the academic success of English learners relies on approaches such as sheltered instruction and on tools such as the SIOP Model. Created by Echevarria, Vogt, and Short (2008), the SIOP Model’s original purpose was for research. Since then, it has evolved into a framework of best practice within the field of ESL pedagogy. For this project, I will be interviewing all eight of the ELA (English Language Acquisition) teachers at Grand Island Senior High, where I am currently student teaching in one of the ELA classrooms. I will also conduct research on the Marzano framework, as the district is moving toward that protocol in the next two years. The Marzano Protocol, created by Dr. Robert Marzano, identifies 41 key strategies and is oftentimes connected to the SIOP Model. I will then compare and contrast the SIOP Model to the Marzano Protocol and present my findings in the form of a poster presentation.

## Music and Performing Arts

( 10 )

**Presenter – Danielle Kluver**

Department: Music and Performing Arts

Advisor: Dr. Anne Foradori

Title: *Musical and Cultural Significance in Samuel Barber’s Knoxville: Summer of 1915*

Program music, a genre that suggests images or conveys the notion of a certain experience, is the idyllic way to describe Samuel Barber’s Knoxville: Summer of 1915. Although the prose poem and composition were written and

composed at separate times, the connection that Barber and Agee shared through the profound impact of the death of their respective fathers lies at the emotional core of this work. Through literary and compositional analysis, as well as research on the distinct writing styles of Barber and Agee, this nearly flawless composition was broken down into the key elements that fused to create this American seminal masterwork. Samuel Barber and James Agee's respective bodies of work give a glimpse into the type of composer and author they were. The search for their native voice — their "American" voice — was something that interested both James Agee and Samuel Barber. Barber uses a series of alternating compound meters in Knoxville, facilitating a use of vernacular text setting which allows the vocal line to be easily understood. The medium-range tessitura of the vocal line is a key element in creating understandable text throughout this work. This vernacular writing offers the performer an ideal platform from which to relate the narrative, and provides the audience with an opportunity to leap into the gentle world that Agee's words present. The cultural impact of Knoxville: Summer of 1915 is visible throughout the work. Barber's use of Jazz and Blues musical idioms plays an important role in its "American" sentiment. This connection to a popular style of music in America was unique at this time in music. James Agee produced a colorful, highly descriptive text that described a time in our country's history that truly seemed perfect, which offers the feeling of nostalgia to the listener. The collaboration between poet and composer brought forth an opportunity for performers past and present to depict a piece of American culture, and a moment in history filled with sincere gentleness.

( 11 )

**Presenter – Alyssa Wetovick**

Department: Music and Performing Arts

Advisor: Dr. Sharon Campbell

**Title: *A Case Study of Music's Influence on Alzheimer's Patients' Behavior***

Patients with Alzheimer's disease generally have better recognition of the past and are more aware of their current surroundings when music is involved in their environment. To encourage high quality of living, this case study was conducted to investigate whether familiar music opposed to nonfamiliar music would make a patient with Alzheimer's disease more aware of the past and behave naturally in their present surroundings. The primary subject was selected based on participation in social settings and the ability to communicate effectively, both verbally and nonverbally. The subject was observed for her reactions to music in a background setting and music as a prominent activity. The subject was also observed when music wasn't present in the activity. The subject engaged in music related activities such as sing-a-longs, drum playing, and listening to audio recordings. Reactions that were recorded during sessions related to the posture of the subject, the subject's facial expressions, and the overall social interaction with peers. By analyzing the subject's reactions to these music related activities, it was determined whether or not the subject became agitated or stayed relaxed in the current surroundings. Answers in response to questions concerning memory of past events determined whether the presence of familiar music versus nonfamiliar music helped the subject to be more aware of past events.



# Behavioral & Social Sciences



## Geography and Earth Sciences

**(12)** Presenter –Cale Eacker

**Co-Presenters –Ashley Larsen, Tayler McPeak, Fletcher Sheridan, Joe Smidt, Tanner Stark, and Kaitlyn Taylor**

Department: Geography and Earth Sciences  
Advisor: Dr. Paul Burger

Title: *Market Area Analysis of Robinwood Retirement Community: How GIScience Integrates Marketing Geography and Spatial Analysis.*

This study analyzes the market area of the Robinwood retirement community in the Memphis, Tennessee metropolitan area using their resident and customer prospect data. GIScience is utilized in conjunction with principles of marketing geography and spatial analysis to: delineate the geographic extent of the market area, identify the socioeconomic and demographic characteristics of customers, and prioritize locations and prospective residents within the market area based upon these characteristics. The results will provide Robinwood with a better understanding of their market area and assist them with marketing decisions related to their resident and customer prospect data.

**(13)** Presenter –Emily Kaslon

Department: Geography and Earth Sciences  
Advisor: Dr. Jason Combs

Title: *Electric avenues throughout the United States*

This project explores possible outcomes of replacing 3.9 million miles of United States roads with hexagonal interconnected solar panels. The company, Solar Roadways, made their first prototype in 2009. The idea is to convert typical paved roads into solar panel highways, which would allow the transportation network to operate as a power generation system that would be self-sufficient and safer for transporters. Solar Roadways technology can make it possible to provide light where there is none, as well as LED warning signs and signals to drivers. Also during cold weather, heating elements can melt ice and snow. The Federal Highway Association was the initial benefactor for the engineering behind Solar Roadways technology. The Idaho-based company is working on a tempered glass panel design infused with LED lights. The panels are designed to withstand extreme pressure and to have an easy-grip surface for optimum traction. One of the main concerns for consumers is making this change economically viable in all locations including rural and urban areas. Taking that into account the amount of electricity created by the accumulated solar panels would sustain three days of the power for every one day of sun exposure. Transportation choices can be positively impacted by solar roadways and change the future conditions of the interconnected world.

**(14)**

**Presenter – Ashley Larsen**

Department: Geography and Earth Sciences

Advisor: Dr. Paul Burger

**Title: *A spatial examination of geographic factors that influence voter turnout in Nebraska***

Many academic disciplines, such as, political science and psychology, have evaluated the personal and social factors at play in voter turnout. Largely overlooked, however, is the “geography” of voter turnout. Namely, do certain geographic factors such as: urban vs. rural location, distance or accessibility (for those in rural and/or remote areas), population density or geographic communities impact the likelihood of a potential voter turning out on Election Day? Nebraska provides a rich area of study as 51 percent of registered voters live within the Omaha and Lincoln metropolitan areas, while the other 49 percent are scattered statewide. Historical statewide voter turnout data from the previous four elections were obtained from the Nebraska Secretary of State and integrated with Geographic Information Science (GIScience), principles of electoral geography, and spatial analysis. This allows for an examination of the impact that geographic factors—location, population density, and distance to the nearest town, for instance—have on voter turnout in Nebraska.

**(15)**

**Presenter – Ashley Larsen**

**Co-Presenters – Nic Stoll, Zach Davidson, and Dayana Rodriguez**

Department: Geography and Earth Sciences

Advisor: Dr. Paul Burger

**Title: *Delineation and Analysis of UNK Undergraduate Student Body Market Area Through GIScience***

Colleges and Universities in Nebraska perpetually are competing for students with sufficient academic standards to be successful at the undergraduate level in a market that is both finite and, in some cases, declining in terms of graduation rates from Nebraska High Schools. The University of Nebraska system has three campuses that provide comprehensive undergraduate degrees with campuses in Lincoln, Omaha, and Kearney. This study will analyze the market area of U.S. domestic undergraduate students for the University of Nebraska at Kearney (UNK) using the current 2013-2014 full-time undergraduate student body and those in the most recent applicant pool from recruitment efforts leading up to the Fall 2013 semester. Geographic Information Science (GIScience) technology is integrated with principles of marketing geography to first delineate and then compare the primary market areas of Applicants, Enrollees and the entire undergraduate Student Body at UNK. Keywords: university enrollment, market area analysis, GIScience.

**(16)**

**Presenter – Eon Lemburg**

Department: Geography and Earth Sciences

Advisor: Dr. Jason Combs

Title: *Horse racing: a sport connecting the United States*

Horse racing has been popular for centuries. One might look at the horse racing industry as a dying breed, especially in the Midwest. However, horse racing today is alive and well in the United States. Even with the racing industry receiving a bad reputation for alleged animal cruelty and drug abuse the sport provides a tremendous economic boost for the entire country. Along with profits, horse racing brings joy to thousands of fans across the nation. With the help of simulcasting and technology racing enthusiasts across the nation are now able to watch and wager on some of America's largest races —the Kentucky Derby, Preakness, and Belmont Stakes, for instance. This project illustrates the spatial patterns and economic impacts of the horse racing industry in the United States.

**(17)**

**Presenter – Tayler McPeak**

Department: Geography and Earth Sciences

Advisor: Dr. Vijendra Boken

Title: *Assessing the Impact of Irrigation on Global Warming*

The irrigated area as well as temperatures in Nebraska has been increasing. While there may be several factors responsible for global warming, the present study focuses on the possibility of finding a relationship between the irrigated acres and the temperatures. Increasing irrigated acres tend to enhance the soil moisture that leads to raising the concentration of water vapor (a greenhouse

gas) in the atmosphere. Data relating to irrigated acres, soil moisture, and temperature were collected from the United States Department of Agriculture, the Technical University of Vienna, and High Plains Regional Climate Center, respectively. The project was funded by Daugherty Water for Food Institute. Using ArcMap the soil moisture estimates were averaged for different counties in Nebraska and were regressed against the irrigated acres and the temperatures. Discussion for the spatial variation in the strength of above relationships across counties will be included. Such analysis could show the effects of irrigation on climate and where Nebraska could head if farmers continue to heavily irrigate their fields. As a result, the study will contribute to irrigation planning in the state.

**(18)**

**Presenter – Kaitlyn Taylor**

Department: Geography and Earth Sciences

Advisor: Dr. Jason Combs

Title: *Generational Political Patterns: The Case Study of Presidential Election Results in Kearney, Nebraska*

Politicians and scholars alike have evaluated and studied voting patterns at various geographical levels for decades. Projects have examined voting patterns for presidential elections, Congressional races, and even confirmation votes in the Senate. Our project builds on these previous studies by spatially examining voting trends in Kearney, Nebraska. A total of 2,110 ballots were completed by local elementary and middle school students and compared to the 11,909 votes cast for president in 2012 by the adult population. As anticipated, there was a strong positive correlation ( $r = +0.738$ ) between the adult and student vote totals. Additionally,

multiple socio-demographic variables, such as, employment, higher education, home ownership, and income help explain the voting patterns at the precinct-level in Kearney.

**(19)** **Presenter – Kaitlyn Taylor**  
Department: Geography and Earth Sciences  
Advisor: Dr. Jason Combs  
Title: *A GIScience Approach to Analyzing Spatial Patterns of Voter Turnout in Omaha, Nebraska*

Scholars from a variety of disciplines have analyzed voter turnout. Often overlooked, however, is the ‘geography’ of voter turnout patterns. Nebraska presents a diverse study area to examine geographic factors related to turnout. Over 51 percent of the state’s registered voters live in three counties—Douglas, Sarpy, and Lancaster—which contain the Omaha and Lincoln metropolitan areas. This project employs Geographic Information Science (GIScience) along with electoral geography principles and spatial analysis to evaluate turnout across the Omaha metropolitan area. Getis-Ord  $G_i^*$  statistic and Mean Center are utilized in the spatial analysis.  $G_i^*$  demonstrates statistically significant spatial clustering of high or low values of voter turnout and the Mean Center identifies the geographic center (the center of concentration) for a set of features, in this case voters. This study also examines a number of demographic variables which help explain voting patterns in the Omaha metropolitan area.

**(20)** **Presenter – Kaitlyn Taylor**  
Department: Geography and Earth Sciences  
Advisor: Dr. Jason Combs  
Title: *The role of geography education in k-12 curricula*

In many K-12 curricula, geography plays only a minor role. This paper examines geography education in Nebraska and the discipline’s importance throughout the past century. At the national-level, Nebraska was forty-ninth in adopting K-12 content standards that include geography. Geography is essential in today’s world; it fosters critical thinking skills, which are fundamental in addressing current issues. Within the past decade Nebraska’s Department of Education has improved geography curriculum standards and now requires assessment at each grade level. Students at each grade level are expected to understand certain geography concepts and skills outlined in the new standards. While geography standards have advanced, there are still many educational obstacles to overcome.

## Political Science

**(21)** **Presenter – Audrey Grant**  
Department: Political Science  
Advisor: Dr. Christie Maloyed  
Title: *State-Required Civic Education: Are There Discernible Benefits?*

This paper examines the importance of civic education. First, I conduct a review of the literature, in an attempt to understand why some push for a greater emphasis on civic education, and reasons why this may not be a

priority. I then analyze current states' requirements, attempting to discern any differences that would make a case on either side. To do this, I analyze states' civic education requirements, including whether or not there is a required state assessment in Social Studies and whether or not a course in civics is required for graduation. I compare this to the states' civic health index scores and voter turnout, while controlling for other factors that may affect the results, such as poverty rates, the percentage of the state population that is black, and whether or not the state had easy voting methods available. I then discuss the implications of these results regarding state requirements for civic education.

**(22)** **Presenter – Courtney McClellen**  
Department: Political Science  
Advisor: Dr. Christie Maloyed  
Title: *Technology's Affect on Voter Turnout*

Technology is ever changing. The changes in technology have different effects on aspects of life. This project is focused on technology and the affects that it has on voter turnout in the United States. The research part of this was based on studying and analyzing the voter turnout rates in various presidential elections. The changing and developing technology was also researched and analyzed. Changes such as cell phones, computers, and social networking (i.e. the Facebook "VOTE" initiative) were taken into consideration. The voter turnout rates and the changes in technology were compared in a timeline fashion to visualize the effects that technology had on voter turnout.

**(23)** **Presenter – Shelby Rowan**  
Department: Political Science  
Advisor: Dr. Peter Longo  
Title: *Exploring the Value of Rural Life: Providing Curricula Opportunities*

From Thomas Jefferson to Wendell Berry, citizens have long championed the value of agrarianism. Sustaining the rural sector is essential to the maintenance of a positive set of social capital outcomes. Yet, the demographics reveal a prolonged and persistent decline in rural populations. Despite the demographics, rural communities still hold considerable value for the citizenry. While the necessity of farmers and rural dwellers is mentioned in the curricula of high schools and universities, the offerings for in-depth scholarship about rural life is commonly seen as less than a necessity, while occasionally not an option. There are opportunities to broaden and enhance college offerings in order to provide students with experience pertaining to rural life. Study abroad programs serve as a model for other endeavors such as rural travel experiences. This poster will establish the theoretical importance of rural course offerings, offer data regarding the perceptions of rural life, explore curricular opportunities analogous to study abroad offerings, and propose curricula modifications for the experiential study of rural America and abroad.

(24)

**Presenter – Caitlin Williams**

Department: Political Science

Advisor: Dr. Christie Maloyed

Title: *The Founding Fathers on Income Inequality*

The ideas of the Founding Fathers have been used as a basis to think through many types of political problems. One of the paramount problems in the United States today is the income gap. Policymakers, on all points on the political spectrum, are trying to define the problem of the income inequality in the United States and are developing plans to address it. Unfortunately, there is not an extensive amount of scholarly work focused particularly on the Founding Fathers' feelings towards income inequality or their beliefs on if and how the government should get involved in alleviating it. I set out to find the scholarly information on the topic and to research the Founding Fathers' own words on the subject. In order to do this, I used key words to search political and historical scholarly works and the primary works of James Madison, Thomas Jefferson, John Adams, and Alexander Hamilton. All of their primary works were available on the Online Library of Liberty provided by [libertyfund.org](http://libertyfund.org). The key words or phrases that I used were: wealth, economy, income gap, income inequality, wealth distribution, occupational stratification, wage differential, income distribution, wealth disparity, income disparity, poor, plebeians or plebians, poverty, and impoverished. James Madison thought that the wealth disparity might cause tensions between the classes. He recommended that state governments work with the private sector to make more opportunities for the poor. Thomas Jefferson detested income inequality and thought that legislators should

create laws to allow poor people a chance to succeed in life. This included paying for school (with some caveats) using a higher tax for the wealthiest. John Adams believed that the government should strive to make "the pursuit of happiness" available to all classes. Alexander Hamilton did not put income inequality as a top priority problem and his national bank idea catered to corporations and the wealthy.

## Psychology

(25)

**Presenter – Michael Cantrell**

**Co-Presenter – Tommy Augustin**

Department: Psychology

Advisor: Dr. Krista Fritson

Title: *Public Perceptions of Clerical Wear*

Clergy members, or those affiliated with a religious order, are sometimes treated differently than other professionals. Research findings reveal that clergymen and women receive more attention than do men and women of other professions, especially when the clergy members wear the associated clothing, commonly called clerics in Christian denominations. Specifically, within the clergy profession, women receive more criticism and negative attitudes than do men. Because most of the previous studies gather data regarding clergy perceptions from church congregations, we question perceptions of clergy made by the general public. An observational study was performed that included a male and female pastor in clerics or casual wear while in public places such as coffee shops, a shopping mall, and a mid-western university campus. Participant behaviors and responses were recorded, which included different measures of positive

or negative responses. We hypothesized that the pastors would receive more attention, both positive and negative, when they wore their clerics rather than casual wear. We also hypothesized that the female cleric-wearing pastor would receive more negative attention than the other conditions, followed by the male cleric-wearing pastor. Our results and considerations for real world are discussed.

**(26)** **Presenter – Alexa Haave**

Department: Psychology  
Advisor: Dr. Theresa Wadkins  
Title: *Cheating Behaviors in UNK Undergraduate Students*

Academic dishonesty is a prevalent problem among college students. Researchers have concluded that a participant's ethic was a predictor of whether or not the participant would be more likely to engage in cheating behaviors. Honors programs have also been observed in these studies. They represent the students who excel in academics, and cheating behaviors are expected to be less prevalent. The expectation may be compromised when academic consequences (i.e. revoking of title, privileges, and scholarships) are presented. I conducted a two-part study. The first study assessed the general attitudes of Honors Program students and non-Honors undergrads regarding cheating behaviors. Honors and non-honors students completed a questionnaire about cheating behaviors. Their scores were compared to determine if there were differences in their perceptions. We hypothesized that, given the demands for success in an honors program, cheating attitudes may be more justified by Honors students. Few differences were found between the groups. In the second study, we

set up a scenario to encourage cheating behavior. We then compared the differences between Honors and non-Honors students.

**(27)** **Presenter – Sarah Hall**

Department: Psychology  
Advisor: Dr. Krista Forrest  
Title: *Why Did The Music Stop?*

On April 5, 1994 Kurt Cobain committed suicide leaving many fans with unanswered questions. The goal of this project was to evaluate Cobain's suicide note using a technique called content analysis. After reviewing previous articles examining the words and themes frequently present in suicide notes (Gunn, Lester, Haines & Williams, 2012; Osgood & Walker, 1958; Richman, 1978), I examined the frequency with which Cobain referenced terms of endearment, religion, empathy, belongingness and burdensomeness. Similar to previous research comparing genuine and simulated suicide notes we found that Cobain used terms of endearment and referred to religion (Osgood & Walker, 1958) but also described himself as isolated from others. Richman (1978) suggested interdependence (symbiosis) within a relationship allows empathy toward others. In Cobain's suicide note, he described that his hatred towards others stemmed from his inability to exhibit empathy. In this case, Cobain is withdrawing from the symbiotic partner(s) he knows as his fans. This contributed to his loss of interest in creating music, the livelihood that he previously enjoyed. Another factor hypothesized to relate to suicide is the extent to which an individual feels he or she is disconnected from or burdens family members and friends (Gunn, 2012). Cobain indicates in his letter that he feels

disconnected from others and that his daughter will be much happier without him. After addressing these and other findings, the viewer will have the opportunity to analyze the note and accompanying artwork that captures the moment before he commits suicide.

**(28)** **Presenter – Katelyn Haschke**

Department: Psychology

Advisor: Dr. Krista Fritson

Title: *Reflective Journaling: Building Middle School Students' Self-Esteem and Self-Efficacy*

The purpose of our study was to explore the effect reflective journaling has on middle school students' self-esteem, self-efficacy, and perceived stress levels. Participants were students in a middle school after school program in central Nebraska. Participants included 21 middle school students (11 females and 10 males ages 11 to 13) in either a non-journaling (control) group or a journaling group. Students journaled about predetermined topics chosen by the researchers. These topics included positive quotes and anecdotes to promote introspection and generate positive reflections to be expressed in the journal entries. Students who did not journal attended regularly scheduled after school program events. Before and after a six-week period of journaling twice weekly, participants completed a demographics survey as well as questionnaires regarding their self-esteem, self-efficacy, and perceived stress levels. We hypothesized students in the journaling group would show increases in self-esteem and self-efficacy and decreases in perceived stress. While the findings are not statistically significant, the trends of decreasing stress and

increasing self-efficacy suggest journaling has effects similar to those hypothesized.

**(29)** **Presenter – Cameron Staudacher**

Department: Psychology

Advisor: Dr. Krista Fritson

Title: *What Factors Affect Mental Health Stigma?*

Research shows that heightened perceived stigma or personal stigma is a significant barrier to mental health care (Eisenberg, Downs, Golberstein, & Zivin, 2009). Given that mental health problems such as depression and anxiety are increasing among college students (Hunt & Eisenberg, 2010), it is vital to improve our understanding of mental health stigma. Education regarding mental health and experience with family members who have a mental health condition may have an effect on how mental health conditions are perceived by others. One hundred forty-eight college-age participants (28 men, 120 women) completed our study through Qualtrics. Participants completed questionnaires assessing education and experience with mental health conditions, as well as perceptions of stigma. We predict more education about and experience with a family member who has a mental health condition will yield lower negative attitudes and less stigma regarding mental illness conditions. Multiple regression analyses will be completed and discussed.

**(30)**

**Presenter – Geoffrey Streeter**

Department: Psychology

Advisor: Dr. William Wozniak

Title: ***The Bill Buckner Effect: Is Our Memory of Others Overshadowed By One Error?***

In this study we are evaluating the initial perceptions and memories of an athlete's performances. Participants watch clips of an athlete, rated the performance in each clip, rated the overall performance, then rated that athlete after 48 hours. Our independent variables included the time of rating, immediate or delayed. The second was the type of clip series: (a) error committed by the athlete at the beginning of series, (b) no error included in the clip series, or (c) error at the end of the clip series. No significant effects were found across all areas examined. We did find a trend in the interactions of the two independent variables, suggesting that an error at the beginning of the series may have a greater effect on memory than the other two conditions.

## Social Work

**(31)**

**Presenter – Emma Carstens**

Department: Social Work

Advisor: Dr. Christina Sogar

Title: ***Does School Breakfast Influence Student Performance?***

A healthy breakfast has been shown to improve concentration, academic performance, school attendance rates, and overall wellbeing (Basch et al, Benton & Jarvis; Wedenhorn-Muller et al). The Food

Research and Action Center (2012), an organization working to eradicate child hunger in the United States, recently released a report calling for state School Breakfast Programs (SBP) to reach at least 70 percent of the children who qualify for free or reduced price school lunch. In Nebraska, however, only 31% of children in poverty participate in the SBP causing Nebraska to be ranked 49th in the Nation (Food Research and Action Center, 2012). In order to address the low participation in SBP in Nebraska, Legislative Bill 834 has been introduced which would provide funding for SBP development within the state. The current legislation indicates that school breakfast is a timely topic in Nebraska; however, more research is needed on how SBP operate in the state and the benefits associated with them. This project had three distinct components. First, the availability and characteristics of SBP in Nebraska school districts were examined. Second, variables associated with the provision of school breakfast, such as the size of the district, and the number of families in poverty were investigated. Finally, the outcome variables that were correlated with the availability of school breakfast, including graduation rates, ACT scores, percentage of students meeting state standards, and student attendance were analyzed. References Basch, C.E. (2011). Breakfast and the achievement gap among urban minority youth. *Journal of School Health*, 81(10), 635-640. Benton, D. & Jarvis, M. (2007). The role of breakfast and a midmorning snack on the ability of children to concentrate at school. *Physiology of Behavior*, 90, 382-385. Food Research and Action Center. (2012). Profile of hunger, poverty and nutritional programs. Retrieved from: <http://frac.org/wp-content/uploads/2010/07/ne.pdf>

# Natural and Physical Sciences



## Biology

### **(32)** Presenter – Alyssa Dillon

Department: Biology

Advisor: Dr. Julie Shaffer

Title: *Investigation of Abiotic and Biotic Parameters in three Nebraska Sandhill Lakes within the same Drainage*

The objective of this study is to define the current abiotic and biotic parameters of three selected sandhill chain lakes within Brown County, Nebraska. The primary lakes for this study occurred in the same drainage and included: Willow Lake, Diamond Lake, and Rosenbach Lake. Fish species were collected and identified using trap nets. Zooplankton were collected using an 80-µm mesh Wisconsin-style zooplankton net, which were identified and quantified to common taxa groups. Water quality parameters were also collected. Fish collection found that Willow Lake, which had been recently rotenoned, had a small presence of common carp (*Cyprinus carpio*). Diamond Lake and Rosenbach Lake showed established populations of common carp. Zooplankton results found that the lakes with carp were less diverse but had higher zooplankton densities than the lake without an established carp population. Willow lake

had a secchi reading greater than 120 cm, while Diamond was 15 cm and Rossenbach was 33 cm. These findings support the high levels of carp in Diamond and Rossenbach. This baseline data will continue to be collected monthly from April to October to make comparisons between lakes with and without carp, and to highlight the potential for a fishery and aquaculture.

### **(33)** Presenter – Cody Dreier

Department: Biology

Advisor: Dr. Keith Geluso

Title: *Mammalian Records from Southwestern Kansas and Western Oklahoma, including Crawford's Desert Shrew (*Notiosorex crawfordi*) from Kansas*

Mammalian distributions are constantly changing. Some distributional shifts reflect habitat change, climate change, and human transplantations, whereas other species appear to shift but new records actually reflect undetected populations due to a lack of past surveys or species difficult to detect. In 2013, we employed multiple techniques to document mammalian distributional records in southwestern Kansas and western Oklahoma. We discovered three new county records in Morton County, Kansas (Crawford's desert shrew, *Notiosorex crawfordi*; American beaver, *Castor canadensis*; and eastern fox squirrel, *Sciurus niger*), with Crawford's desert shrew also representing the first records for the species in Kansas. We documented five new county records in Cimarron County, Oklahoma (least shrew, *Cryptotis parva*; American parastrelle, *Parastrellus hesperus*; wapiti, *Cervus canadensis*; white-tailed deer, *Odocoileus virginianus*; and eastern fox squirrel, *Sciurus*

niger). We suspect that the fox squirrel and least shrew are expanding their distribution into the region along the Cimarron River, whereas the wapiti, white-tailed deer, and beaver likely are recolonizing the area after extirpation during the last century. Occurrence of eastern fox squirrels in Elkhart, Kansas, and Boise City, Oklahoma, likely represents human introductions. The American parastrelle and desert shrew likely have gone undetected at our sites of occurrence and have not recently experienced an expansion in distribution. Our survey demonstrates the importance of continued surveys with various methods to document mammals. Both counties have been intensively surveyed in the past for mammals, indicating that targeted surveys and various techniques are important to documented distributional shifts as well as rare or difficult to capture species. Understanding the species present in an area is requisite for managing habitats and wildlife and will allow us to better elucidate future changes in distributions.

**(34)** **Presenter – Tad Fuchs**

Department: Biology

Advisor: Dr. Kimberly Carlson

Title: *Production of Nora virus ORF1 Monospecific Antisera*

Picornaviruses are positive, single-stranded RNA viruses that have a single open reading frame, ORF, allowing for easy replication. Nora virus, a *Drosophila* picorna-like virus, is functionally like other picornaviruses, but not structurally as it has four open reading frames instead of just one. There is not much known about the individual open reading frames encoded by the virus mainly the ORF of interest, ORF1. It is believed to have a role in

RNA interference, RNAi, suppression through inhibition of the RNA induced silencing complex, RISC. This allows Nora virus to remain persistent in its host. The purpose of this study is to produce monospecific antisera specific to the ORF1 encoded protein, viral protein 1, VP1, with validation of specificity via Western blot analysis. ORF1 nucleic acid was codon optimized, amplified via PCR, and cloned into pET28a. The pET28a-ORF1 was transformed and expressed in BL21 *E. coli* competent cells. The resulting VP1 protein was purified via affinity column chromatography. The purified VP1 protein was injected into mice for the production of monospecific antisera and collected via retro-orbital bleeding. Expression of VP1 was assessed using Western blot analysis and a product was present at approximately 60 kDa, which was the expected result. This indicated the specificity of the antisera to the VP1 antigen. Currently, this antisera is being tested for its usefulness in immunohistochemical studies to determine the site of synthesis of VP1. In toto, the monospecific antisera produced will be useful for the characterization of ORF1's role in Nora virus replication.

**(35)** **Presenter – Jordanna Glock**

Department: Biology

Advisor: Dr. Dawn Simon

Title: *Intron Heterogeneity and Evolution in the Lichen-fungi Teloschistes*

Introns have no known general function, yet are ubiquitous across eukaryotes. Despite this, their origin is not well understood. We are particularly interested in ribosomal RNA (rRNA) introns, because they have a recent origin. Specifically, we hypothesize that they

arose from group I ribozymes, which are common in the same taxa. Here we focus on one position in the small subunit in the fungal genus *Teloschistes*. Previous work suggests that multiple types of introns exist at this position. The primary objective of this ongoing study is to increase sampling and discover additional introns that represent intermediate steps in the transition from group I ribozyme to spliceosomal intron. In the course of this work, we found evidence for intron presence/absence heterogeneity within one sample collected in Nebraska. Previous work on other systems suggested that this is common, however it has not been directly shown until now. This intron was further characterized for in vivo splicing ability and compared to other introns at this position.

**[36]** **Presenter – Abby Hongsermeier**

Department: Biology

Advisor: Dr. Dawn Simon

Title: *Teaching Evolution: An Activity Based Approach*

Evolution is a fundamental theory in biology. Yet, it has been shown that college students, regardless of chosen major, have an inadequate understanding of it. This is at least partially due to ineffective teaching at the high school level. Fortunately, the use of interactive activities may alleviate this problem. The objective of this project was to develop an exercise that could easily be used at either the high school or college introductory level to specifically address some common misconceptions. The exercise simulates the four major processes in evolution (natural selection, random genetic drift, mutation, and migration) using LEGO® organisms, as well as visually

depicting descent with modification. It was tested in one section of Biology I at the University of Nebraska-Kearney using a pretest/posttest assessment. Based on student learning, comments, and instructor experience, the lab will be modified and tested with a larger sample size in the future.

**[37]** **Presenter – Emma Keele**

Department: Biology

Advisor: Dr. Letitia Reichart

Title: *Triglycerides of Migratory Songbirds in South Central Nebraska*

Variation in lipid metabolism is linked to differences in resource use and innate genetic variation. South central Nebraska is an important migratory stopover site because birds use it for refueling along their migratory path. Acquiring lipids on stopover sites is especially important to allow birds to complete the remaining portion of their migration. In addition, birds able to maintain lipids throughout migration are more likely to breed successfully. Specifically, we developed an appropriate assay to detect lipid metabolites in blood plasma for species captured during spring migration. Lipid metabolism in each species is variable, thus baseline information must be collected for each species captured. For species captured, we collected blood samples within five minutes of capture from the brachial vein of migratory songbirds and then samples were stored on ice. Plasma was removed from the remaining blood components and then stored at -80°C until analysis. Here we report species captured and baseline levels for migratory songbirds captured during Spring 2014 and 2015. The specific lipid metabolite that I analyzed was triglycerides. Differences in triglycerides indicate accumulation and

catabolism of lipids. Results from my assays of triglycerides will be used to formulate new testable hypotheses regarding lipid metabolism for migratory birds that use Nebraska as a migratory stopover site.

**(38)** **Presenter – Alexis Page**

Department: Biology

Advisor: Dr. Kimberly Carlson

Title: *Production of Nora virus ORF2 Monospecific Antisera*

Nora virus is a picorna-like virus that has four open reading frames (ORFs). The presence of four open reading frames is in contrast with other members of this virus family, which only contain one long open reading frame. Not much is known about the coding potentials of the four ORFs, especially ORF2. However, it is known that ORF2 is the largest ORF, and it is believed that ORF2 encodes the replicative proteins such as the RNA polymerase (RNAP) and helicase. In addition, it is predicted to specify the viral protease, which is needed to process the predicted polyproteins encoded by ORF 2 and ORF 4. The RNAP is of intense interest because it allows the virus to replicate its RNA. The purpose of this study was to express and purify the RNAP region of ORF2, and to produce monospecific antisera in mice against this protein. The resulting ORF2 RNAP was expressed, purified, and analyzed using SDS-PAGE. The results showed a protein product at ~30 KDa, which is the expected size for ORF2 RNAP. After batch expression and purification of ORF2 RNAP, it was injected into mice and blood serum containing the monospecific antibodies was collected. The resulting monospecific antiserum was validated with Western Blot using infected fly lysates. The production and

validation of the monospecific antisera is a useful tool for characterizing the structure and function of ORF2 RNAP from Nora virus.

**(39)** **Presenter – Ryan Sowle**

Department: Biology

Advisor: Dr. Kimberly Carlson

Title: *Drosophila melanogaster Nora virus virus-like particles: in vitro assembly*

Nora virus is a recently discovered RNA picorna-like virus that produces a persistent infection in *Drosophila melanogaster*. This virus is of interest because it is similar to the human picornaviruses that are responsible for human diseases, such as polio, hepatitis A, foot and mouth disease, and the common cold. Virus-like particles (VLPs) are non-infectious virions, which contain only empty capsids with no enclosed packaged genetic material. Assembly of VLPs, for diseases caused by known viruses that lack efficient treatment and prevention, could be essential in the production of vaccines. For this study, VLPs of the Nora virus ORF 1, -3, -4a, -4b, and -4c proteins were placed together, in vitro, to determine the gene(s) that are essential in assembling the structural capsid. Proteins were separated through cesium chloride gradients and detected by Western blot analysis. Further visual composition and aggregation of protein was confirmed by electron microscopy. Electron microscopy revealed a size distribution similar to that of wild type virus when viral protein 4A is present with an additional protein, but the lack of VP4A, or VP4A alone, results in scattered size distribution, potentially indicating VP4A as the scaffold protein. The Nora virus assembly pathway is not yet known, but consideration of this could lead to

a deeper understanding of how picornaviruses in general undergo assembly.

**(40)** **Presenter – Ashleigh Teten**  
**Co-Presenters – Rachel Wemhoff and**  
**Isabella Gomez**

Department: Biology

Advisor: Dr. Paul Twigg

Title: *Quantitation of lipid accumulation in Chlamydomonas reinhardtii under oxidative stress*

This project examines the response of *Chlamydomonas reinhardtii* to nutrient deficiency and peroxide treatment. Under this sort of stress, the model alga *Chlamydomonas* is known to accumulate large lipid droplets which can be harvested for biofuel production and provide an alternative to fossil fuels. In this study, 150 mL *Chlamydomonas* cultures (strains cc124 and cc125) were grown under normal conditions in phototropic medium. Once grown to a cell density in excess of one million cells per milliliter, one culture of each strain was transferred to phototropic medium lacking nitrogen. The remaining six cultures remained in normal phototropic medium, five of them being treated with H<sub>2</sub>O<sub>2</sub> (hydrogen peroxide) at concentrations of 100  $\mu$ M, 400  $\mu$ M, 1 mM, 5 mM, and 10 mM daily. Samples were collected over a 10-day time course for each strain. Nile red/DMSO staining was used to detect the lipid droplets, which could then be quantitated using a FluoroMax-4 fluorometer with a detection wavelength of 580 nm. The full fluorescent data for the time course will be presented. This project is intended to be in preparation for a larger study of the genetic control of lipid accumulation. This project was funded by the NSF-EPSCoR program grant “Nebraska 2010-15 RII Project: Nanohybrid

Materials and Algal Biology” (award number EPS-1004094).

**(41)** **Presenter – Joshua Wiese**

Department: Biology

Advisor: Dr. Bryan Drew

Title: **Molecular Phylogeny and Biogeographical History of the Genus Agastache (Lamiaceae): Examining an East Asian-North American Disjunction**

Agastache is an aromatic flowering plant genus within the plant family Lamiaceae (mints). Several Agastache are economically important in the horticultural trade, flavor extraction industry, medicinal treatment, and is currently being looked at as a source of insecticide for grain pests. Within Agastache, there are unanswered questions regarding its biogeographical origin and phylogenetic placement within the Lamiaceae family. All but one species of Agastache occur in North America. A lone species, *Agastache rugosa*, occurs in East Asia. The study aims to correlate speciation events with historical geological events and attempt to come to conclusions on the continental origin of the genus. Analyses employing molecular DNA markers, ITS and ETS, will give rise to a better understanding of temporal and spatial species divergences and help answer the broader mystery of the timing and direction of plant disjunctions between East Asia and North America. Genetic material will be extracted from silica dried samples, from newly collected samples, and from GenBank. Homozygosity of genetic material will be examined between different species of Agastache and the lone disjunct Asian species. Specifically chloroplast DNA will be used to identify relationships between species. Chloroplast DNA is identical to

female parent plants in offspring. Analysis of chloroplast DNA can show removal or introduction of genetic material. Changes in chloroplast DNA are then used to develop an evolutionary story involving geographical and ecological history. Since more species of *Agastache* occur in North America, we hypothesize that *Agastache* originated in North America and that *A. rugosa* allopatric species dispersed by vicariance and isolated from North American populations. It is expected that the *Agastache* genera covered a larger geographical area across North America and spread to Asia via the Bering Land Bridge and Asian populations became geographically isolated from the North American population, leading to speciation of *A. rugosa*.

## Chemistry

**(42)** **Presenter – Jessica Blum**

Department: Chemistry

Advisor: Dr. Christopher L. Exstrom

Title: ***Immobilization and Functional Coating of Gold Nanoparticles in a Polydimethylsiloxane Microfluidic Device Structure***

In work toward the development of a gold nanoparticle-based microfluidic biosensor device, we report progress in the immobilization of gold nanoparticles on approximately 80 x 3  $\mu\text{m}$  rectangular channels in a polydimethylsiloxane (PDMS) microfluidic device structure prepared via a soft lithography process. The microchannels were loaded with poly(diallyldimethylammonium) chloride and, after drying and removing the PDMS device, the coverslip was immersed in a

solution of spherical gold nanoparticles prepared by the reduction of  $\text{HAuCl}_4$  with citrate. Visual evidence and Image J mapping analysis will be discussed. Coating of the immobilized gold nanoparticles with the biolinker Protein A was achieved as indicated by visual color and fluorescence of Alexa Fluor 488 tagging.

**(43)** **Presenter – Emily Brestin**

**Co-Presenter – Brock Madsen**

Department: Chemistry

Advisor: Dr. Mahesh Pattabiraman

Title: ***Binding Interactions Between Dopamine and Water-Soluble Cavitands-Cyclodextrins and Cucubiturils***

This study was conducted in order to gain a better understanding of how dopamine, an important neurotransmitter, interacts with the water soluble molecules cyclodextrins and cucubiturils. Cyclodextrins have been known for their applications in drug administration, but the interactions between beta-cyclodextrin and dopamine have not been studied in a comprehensive manner. Findings of this study were that the smaller cavities alpha-cyclodextrin, beta-cyclodextrin and CB7 engage in a simple 1:1 binding with dopamine, while larger cavities may engage in a 1:2 binding interaction.

**(44)** **Presenter – Aspen Clements**  
**Co-Presenters – Nga Nguyen and Shava Parkinson**

Department: Chemistry  
Advisor: Dr. Mahesh Pattabiraman  
Title: **g-Cyclodextrin Mediated Heterodimerization**

Larger members of the cyclodextrin and cucurbituril macrocyclic cavitation families, cucurbit[8]uril and g-cyclodextrin, are capable of forming ternary inclusion complexes through encapsulation of two small organic molecules simultaneously. Photoexcitation of ternary inclusion complexes involving photoactive guests is an efficient approach for directing bimolecular photochemical reactions. For example, such an approach has been utilized in the past to steer alkene photochemistry towards the entropically less favorable photocycloaddition reaction. This presentation will feature our recent findings on the photocycloaddition reaction between non-identical photoactive alkenes (heterodimerization) achieved using a similar approach, in which reaction control was realized through host-guest and guest-guest supramolecular interactions. We have demonstrated that through an appropriate choice of non-identical reactant alkene pair with subtle, complementary electronic and steric characteristics, the inclusion process could be directed towards the hetero-complex predominantly, which upon irradiation yielded heterodimer as the major product. This approach was used to produce less symmetric, more complex cyclobutane containing structures than has been previously reported. Moreover, photochemical outcomes in conjunction with computational studies were used to predict

the inclusion complex structure and the nature of supramolecular interactions between the components of the complex.

**(45)** **Presenter – Aspen Clements**

Department: Chemistry  
Advisor: Dr. Elisabeth Mills, National Radio Astronomy Observatory  
Title: **Location of Deuterated Ammonia in the Sagittarius B2**

Multiple transitions of singly-deuterated ammonia was detected in Sagittarius B2 using the Karl G. Jansky Very Large Array (VLA) with a resolution of 3'' and the Australia Telescope Compact Array (ATCA) with a resolution of 10''. Deuterated ammonia was detected in two sources in the Northern core of Sgr B2. The most commonly known source, the Large Molecule Heimat, had a velocity of ~61 km/s. The other source we designate as h had a velocity of ~73 km/s. Multiple transitions of ammonia and the isotopologue 15-ammonia were detected as well. NH<sub>3</sub> is a useful tracer of temperature, but in Sgr B2 the transitions were too optically thick to measure accurately. Instead 15NH<sub>3</sub> was utilized to find a rotation temperature and thus kinetic temperature. The temperature of h was higher than that of LMH, which is unexpected, because LMH is more chemically complex and contains an embedded ultra-compact HII region, suggesting it is the more evolved source, and should have a warmer temperature. The column densities of 15NH<sub>3</sub> and NH<sub>2</sub>D were used to find the deuterated fractions in each source. The ratio of 14N to 15N previously measured in Sgr B2 was used to approximate the amount of ammonia. The deuteration fraction was found to be ~40x higher in h than LMH, which is surprising given h is the

hotter source and fractionation reactions that lead to higher deuteration of molecules are favored in cooler temperatures. We will discuss possible explanations for these discrepancies.

**(46)** **Presenter – Josh Edgar**

Department: Chemistry

Advisor: Dr. Christopher L. Exstrom

Title: *Formation of WSe<sub>2</sub> thin films via annealing of a solvothermally prepared nanocrystalline precursor*

WSe<sub>2</sub> is an earth-abundant semiconductor of interest for application as a photovoltaic absorber due to its high absorption coefficient, phase stability, and a direct bandgap of 1.2-1.5 eV that matches well for optimum absorption by photovoltaic cells. The solvothermal preparation method eliminates the need for expensive high-vacuum fabrication steps but the as-made nanoparticles do not exhibit a sufficient degree of crystallinity or specific crystalline face orientation to be cast as suitable thin films for photovoltaic devices. We have successfully fabricated phase-pure WSe<sub>2</sub> thin films, as characterized by Raman spectroscopy and x-ray diffraction, via the annealing of either nanocrystalline WSe<sub>2</sub> or a tungsten-selenium precursor material that was solvothermally prepared from W(CO)<sub>6</sub> and elemental selenium in an aromatic solvent. Materials were annealed in a homemade physical vapor deposition apparatus in an argon atmosphere. The annealing process significantly improved the crystallinity of as-made WSe<sub>2</sub> and successfully converted tungsten-selenium precursor material to WSe<sub>2</sub> films that were highly (002) face-oriented.

**(47)** **Presenter – Emily Edwards**

Department: Chemistry

Advisor: Dr. Amanda M. Glass

Title: *Comparing Myoglobin and Hemoglobin using Circular Dichroism spectroscopy*

Circular dichroism (CD) spectroscopy was used to monitor the stability of the two heme-containing oxygen binding proteins, hemoglobin and myoglobin. CD can be used for measuring the stability of a protein as a function of solution temperature. Presumably, the more weak interactions (e.g. hydrogen bonds, electrostatic attractions) a protein has, the higher its thermal stability, and the higher the T<sub>m</sub>. We have observed that equine myoglobin has a higher thermal stability than bovine hemoglobin, which was unexpected. The structures of hemoglobin and myoglobin are similar, but the former is tetrameric whereas the latter is monomeric. It could be predicted that with hemoglobin, with its four chains, would have a higher T<sub>m</sub> than myoglobin, which has only one chain. However, the opposite trend was observed. We have expanded on this data set by comparing three different sources of hemoglobin protein to observe if the trend is the same at a single solution pH value to see if this trend is replicated through the sources of hemoglobin, or if the bovine hemoglobin is the only protein to behave in this manner.

**(48)** **Presenter – Rachel Flaugh**

**Co-Presenter – Joshua Lallman**

Department: Chemistry

Advisor: Dr. Kristy Kounovsky-Shafer

Title: *Determination of electroosmotic and electrophoretic forces in a gel matrix in different ionic strength conditions*

Nanocoding, a genome analysis platform, relies on very low ionic strength conditions to elongate DNA molecules up to 1.06 (fully stretched DNA molecule = 1)<sup>1</sup>, which is the largest stretch reported in the literature.

Understanding how electroosmotic and electrophoretic forces vary, as ionic strength decreases, will enable better Nanocoding devices to be developed. Using two different gel assays to determine electroosmotic and overall mobility (includes contributions from electrophoretic forces and electroosmotic forces), we were able to determine electrophoretic mobility in different ionic strength solutions. Our first gel assay relied on electrophoresising linear DNA molecules [pUC19 (2.7 kb), pBR322 (4.4 kb), ?X174 (5.4 kb), and PSNAPf-H2B (6.2 kb)] in varying gel concentrations (1.5%, 1.25%, 1%, 0.75%, 0.5%) to determine the free solution mobility (overall mobility) of these molecules in dilutions of TE buffer. As the buffer concentration decreases from 2X (Ionic strength = 13.8 mM) to 1X (Ionic strength = 7.3 mM), the overall mobility increased. As we further diluted TE (< 1X TE), the overall mobility drastically decreased as the ionic strength decreased. For the second assay, we utilized a neutral tracer to determine the electroosmotic mobility. Combining these two assays, we were able to determine the electrophoretic and electroosmotic forces in different ionic strength concentrations. 1. Kounovsky-Shafer, K.L., Hernández-Ortiz,

J.P., Jo, K., Odijk, T., de Pablo, J.J., and David C. Schwartz, D.C. Presentation of large DNA molecules for analysis as nanoconfined dumbbells, *Macromolecules*, 2013, 46 (20), 8356–8368.

**(49)** **Presenter – Michael Hanrahan**  
**Co-Presenter – Josh Edgar**

Department: Chemistry

Advisor: Dr. Christopher L. Exstrom

Title: *Thermal and electronic effects on the solvothermal formation of nanocrystalline WSe<sub>2</sub> in aromatic solvents*

WSe<sub>2</sub> is an earth-abundant semiconductor of interest for application as a photovoltaic absorber due to its high absorption coefficient, phase stability, and a direct bandgap of 1.2-1.5 eV that matches well for optimum absorption by photovoltaic cells. The solvothermal preparation method eliminates the need for expensive high-vacuum fabrication steps but the formation of nanocrystalline WSe<sub>2</sub> in solution has not been explored in detail. We report that the formation of WSe<sub>2</sub>, as characterized by Raman spectroscopy, x-ray diffraction (XRD), scanning electron microscopy, and inductively coupled plasma optical emission spectroscopy (ICP-OES), in a series of aromatic solvents is sensitive to reaction temperature and the electron donating/withdrawing nature of solvent molecule substituents. At temperatures of 155°C and above, the reaction between W(CO)<sub>6</sub> and elemental selenium in yields WSe<sub>2</sub> after heating for several hours. Conducting the reaction at lower temperatures yields a material that has a Raman spectrum and XRD pattern consistent with trigonal crystalline selenium; however, ICP-OES confirms the presence of tungsten.

The role of the solvent in reaction intermediate formation as linked to the favorability of WSe<sub>2</sub> product generation will be discussed.

**(50) Presenter – Haley Houtwed**

Department: Chemistry

Advisor: Dr. Haishi Cao

Title: *Synthesis of a Molecule to Detect Hydrogen Sulfide*

Hydrogen sulfide (H<sub>2</sub>S) has beneficial uses in the body. It deals with apoptosis, inflammation, leukocyte movement, and stroke diagnosis. A common way to detect for hydrogen sulfide is by gas chromatography. This way can only be used outside the cell or the cell has to be destroyed in order to detect the amount of hydrogen sulfide. Fluorescence detection is one of the ways that can be used to show that hydrogen sulfide is present. This detection method can reach maximum fluorescence in a short amount of time. Although these detection compounds can be used inside the cell, they can cause physical changes to the membrane of the cell. The proposed N-Cy3 molecule is a cyanine 3 dye which will detect hydrogen sulfide by becoming fluorescent.

**(51) Presenter – Gunwoo Kim**

Department: Chemistry

Advisor: Dr. Haishi Cao

Title: *Development of fluorescent approaches for detecting fluoride ion*

As a ubiquitous anion pervading in biosphere, the biological roles of fluoride (F<sup>-</sup>) is largely unexplored. In the past decades, understanding roles of F<sup>-</sup> has been extended

from an industry pollution to a therapeutic reagent for osteoporosis and dental protection. F<sup>-</sup> was also reported to involve in many bio-process in living cells, such as formation of reactive oxygen species (ROS) and ion transportation on cell membrane. The Health and Human Services (HHS) and Environmental Protection Agency (EPA) proposed the recommended level of fluoride to be 0.7 mg/l in the drinking water. Over taking fluoride may cause toxic effects including skeletal fluorosis, damage to kidney, liver and brain. Therefore, developing a simple and reliable method for quantitative detection of F<sup>-</sup> is highly desired for understanding its functions.

**(52) Presenter – Joshua Lallman**

Department: Chemistry

Advisor: Dr. Kristy Kounovsky-Shafer

Title: *Determination of Electroosmotic Forces in a Dynamic Range of Ionic Strength Conditions*

Nanocoding is a single DNA molecule genome analysis platform that electrokinetically moves DNA molecules from microchannels to nanochannels using an electric field. Utilizing an electric field to moved DNA molecules in a gel or a microfluidic device requires an understanding of how electroosmotic and electrophoretic forces affect these DNA molecules. Electroosmotic forces can be determined with a neutral dye, called Rhodamine B. Electrophoretic forces only move charged molecules, so if a neutral dye (Rhodamine B) moves during the experiment it is due to electroosmotic forces. Under different gel concentrations with the same ionic strength, we can determine the mobility of Bromophenol Blue, which is negatively

charged, and Rhodamine B, a neutral dye. Next, the ionic strength is varied to determine how electroosmotic forces vary with ionic strength. In decreasing the ionic strengths of the buffer, the mobility of Rhodamine B and Bromophenol Blue increased. The Rhodamine B dye moved toward the negative electrode and the Bromophenol blue moved toward the positive electrode. The mobility of Rhodamine B was a result of electroosmosis. Analyzing the mobility of these two compounds allows us to observe electroosmotic forces and electrophoretic forces that affect DNA molecules moving via an electric field in Nanocoding.

**(53)** **Presenter – Bethany Lueck**

Department: Chemistry

Advisor: Dr. Christopher L. Exstrom

Title: *Stabilization of anisotropic gold nanoparticle shapes by Protein A*

Anisotropic gold nanoparticles exhibit red-shifted surface plasmon resonances that are potentially useful for biosensor applications. While such nanoparticles can be prepared using surfactant-free one-pot methods, the particles are thermodynamically driven toward spherical shapes in later growth stages. We report that Protein A (PrA), which is known to coat gold nanoparticles and serve as a linker to antibodies and other species that can bind to biological analytes of interest, can stabilize branched gold nanoparticles, prepared by the reduction of HAuCl<sub>4</sub> by triethylamine in ethylene glycol solvent, at temperatures up to 90°C as evidenced by UV-vis spectroscopy and transmission electron microscopy. Preliminary investigations of Au-PrA-biotin-streptavidin binding will also be discussed.

**(54)** **Presenter – Tony Munch**

**Co-Presenter – Lauren Hoefft**

Department: Chemistry

Advisor: Dr. Amanda M. Glass

Title: *Characterization of Nickel Binding in a Metallochaperone*

SlyD is a metallochaperone necessary for the insertion of nickel ions into E. coli and other prokaryotic nickel-iron hydrogenases. Metallochaperones are important proteins because they help facilitate metal ion insertion and prevent deleterious side reactivity or improper metal ion insertion into apo-metalloproteins. SlyD contains a C-terminal metal binding domain (MBD) that is rich in nickel-coordinating amino acid residues. The individual binding sites within the MBD have not been elucidated. Conflicting results have indicated that SlyD binds four — seven nickel ions per monomer. This is problematic, because it is expected that the specific metal-ion geometries help facilitate proper metal ion insertion. A lack of understanding about the metal ion binding prevents understanding of the metal ion delivery process. Our work focuses on the characterization of individual metal binding sites within the MBD of SlyD. Other researchers have found that three cysteine pairs within the MBD are necessary for “full” metal incorporation, additionally a lack of these pairs caused diminished hydrogenase activity. Our focus is on these cysteine pairs and the residues that flank them. Our research approach is three-sided; we completed theoretical computational characterization using density-functional theory and both experimental electronic absorption spectroscopy and mass spectrometry. Here we show preliminary work with the computational modeling of one peptide

(Peptide 2, EGCCGG), spectroscopic characterization of the other two (Peptide 1, DGCCGG and Peptide 3, GGCGCH) and mass spectrometric analysis of Peptide 1. Although the peptides are derived from different cysteine pairs within the MBD of SlyD, the peptide sequences are very similar. Peptides 1 and 2 differ by one CH<sub>2</sub> group in their first position amino acid. Peptide 3 contains a histidine residue; this is a residue with a cyclic structure containing nitrogen rather than the carboxylic acids present within the first two peptides' aspartate and glutamate residues.

**(55)** **Presenter – Miranda Neumann**  
Department: Chemistry  
Advisor: Dr. Christopher L. Exstrom  
Title: *Anisotropic Gold Nanoparticles Prepared by the Reduction of HAuCl<sub>4</sub> with HEPES: Optimization of Synthesis Conditions and Shape Stabilization by Protein A*

The shape and surface plasmon resonance (SPR) frequencies and intensities of gold nanoparticles prepared via the reduction of HAuCl<sub>4</sub> with the Good's Buffer HEPES are very sensitive to pH and temperature conditions. Using UV-vis spectroscopy and transmission electron microscopy evidence, we have determined that the optimum reaction temperature and pH conditions for maximizing the longitudinal-to-transverse SPR intensity ratio, a desired biosensor property that red shifts SPR signals away from major analyte interferences, are 26°C and 7.63, respectively. Coating of the nanoparticles with the biolinker Protein A was observed to decrease the degree of aggregation in solution as well as arrest further shape changes when added at any

point during the gold nanoparticle formation reaction.

**(56)** **Presenter – Becky Svatora**  
Department: Chemistry  
Advisor: Dr. Christopher L. Exstrom  
Title: *Stability of gold nanoparticle-based films deposited on plasma-etched borosilicate glass via a layer-by-layer physisorption technique*

Solution casting of gold nanoparticle films for biosensor devices generates less waste than vacuum-based evaporation and sputtering methods for gold film fabrication; however, film uniformity and proper adhesion can be more difficult to achieve. Spherical gold nanoparticles of 30-50 nm diameter were prepared by the citrate reduction method and coated onto plasma-etched borosilicate coverslip substrates that had been previously coated with poly(diallyldimethyl)ammonium chloride. While visibly uniform films were produced, they were sensitive to mechanical wear and nanoparticle aggregation was observed by UV-vis spectroscopy, as indicated by absorption at wavelengths longer than 700 nm, to occur during deposition. Immersion of films in aqueous NaCl solutions induced further aggregation that could be arrested to some extent with a post-deposition coating of the gold nanoparticles with polyethylene glycol. The effect of Protein A, which is known to bind to gold and serve as a linker to biosensor molecules, on nanoparticle aggregation will also be discussed.

## **(57)** Presenter – **Hugo Tobias**

Department: Chemistry

Advisor: Dr. Frank Kovacs

Title: *Testing Ceiling Crystallization Protocol for Protein Crystal Generation*

Ceiling crystallization is a modification of the batch crystallization method where protein crystals are grown in a convection-free environment by using upside-down geometry to enhance the purity and crystallinity of protein crystals. Protein crystals are laborious, complex, and difficult to generate to optimal levels because of the specific conditions that must be met such as a vibration-free environment, temperature, and purity of the solutions and protein. A vibration-dampening table was constructed out of concrete and tire tubes so the protein crystals could grow in a vibration-free environment. The crystals were grown inside of an Igloo Cooler on top of the vibration-dampening table and grew left for approximately two weeks to allow the protein crystals to form. The protein crystals were grown using T-6 Bovine insulin and Hen egg-white lysozyme. Future work will amount to using the ceiling crystallization protocol on ascorbate peroxidase.

## Mathematics

## **(58)** Presenter – **William Broeckelman**

Department: Mathematics and Statistics

Advisor: Dr. Nick Hein

Title: *A Survey of Formulating Incidence Conditions*

In this poster we will discuss the problem of

four lines. We will also look at the local coordinates for bigger spaces that are harder to visualize. Then we look at the different ways that I used to calculate certain examples of the problem of four lines. Finally we will compare using determinants and using null spaces to formulate incidence conditions.

## Physics and Physical Science

## **(59)** Presenter – **Austin Ryan**

Department: Physics and Physical Science

Advisor: Dr. Lee Powell

Title: *Observations and Analysis of a Newly Discovered Binary Star in the Hercules Constellation*

I will present the results of analysis work that my research adviser and I performed on a binary star we discovered in the field of one of the RR Lyrae stars we recently studied. The measured lightcurves were analyzed to find the period of the system which was used to phase shift the B and V lightcurves. The shifted curves were used to determine the mass ratio and other parameters for this newly discovered contact binary system in the constellation Hercules using Binary Maker 3 and the Wilson-Devinney code.



# Professional and Applied Studies



## Communication Disorders

### **(60)** Presenter – Erin Criner

Department: Communication Disorders

Advisor: Dr. Michelle McKelvey

Title: *AAC Assessment Practices in Individuals with Aphasia: Systematic Review and AAC Assessment Practices in Individuals with Aphasia as Recounted by General Practice Speech Language Pathologists*

Assessment of individuals for the use of augmentative and alternative communication (AAC) systems is a challenging task. This is especially true in individuals with aphasia due to significant issues that exist within the disordered language system and difficulty with navigation (McKelvey, Dietz, Hux, Weissling, & Beukelman, 2007). This poster will present the results of systematic review of the literature in the area of AAC assessment for individuals with aphasia. It summarizes the results of the review and presents the implications of the review on the development of a framework for AAC assessment. This systematic review is the first step in a project to develop a standardized protocol for AAC assessment in people with

aphasia. Title: AAC Assessment Practices in Individuals with Aphasia as Recounted by General Practice Speech Language Pathologists How SLPs arrive at conclusions during AAC assessments has not been widely examined. The purpose of this study was to examine how general practice SLPs approach the AAC assessment of adults with Aphasia Four ASHA certified SLPs reviewed a case study and short video clip and provided their impressions of how they would approach assessment in the individual described within the case presentation material and video. This phenomenological study used qualitative data and employed an inductive in vivo coding analysis to derive themes from the data. Results yielded three major themes which included: (1) evaluation preparation; (2) area of assessment; and (3) method of assessment. These themes described the key areas of AAC assessment that general practice SLPs target. The results of this study add to the body of literature that support evidence based practice when conducting AAC assessments for individuals with Aphasia.

### **(61)** Presenter – Brianna Wardyn

Department: Communication Disorders

Advisor: Whitney Schneider-Cline

Title: *Emergent Literacy Intervention for at Risk Preschoolers: A Case Study*

The purpose of this study is to examine the effects of an emergent literacy intervention on the pre-reading skills of a preschool-age child who is at risk for later reading problems. Currently, there is limited information regarding the early indicators of reading problems in children under five years of age, and therefore, few to no interventions to address potential reading problems in very young children have been fully tested. This

project will utilize the limited existing research that describes behavioral characteristics of preschool children at risk for future reading problems. Three pre-reading skills reported as reading risk factors will be assessed: phonological awareness (PA), rapid automatized naming (RAN), and letter knowledge.

## Kinesiology and Sports Sciences

### **[62]** Presenter – Luke Friesen

Department: Kinesiology and Sport Sciences  
Advisor: Dr. Scott Unruh, Ed. D, ATC  
Title: *Shoulder SLAP Repair vs. Biceps Tenodesis*

New West Sports Medicine is conducting an outcomes-based, satisfactory survey that will help determine the functionality of patients who received one of two surgical procedures on his or her shoulder: SLAP Lesion repair (when the labrum is reattached to the glenoid, as well as the supporting muscular structures), and a biceps tenodesis (changing the attachment point of the biceps tendon to a more stable location in case of compromised labrum). Faculty and students at the University of Nebraska at Kearney were asked to aide in the data collection process, as well as the process of reporting our data through a lit review. The importance of this research will be greatly beneficial towards helping medical staff at New West Sports Medicine determine the success rate of a standard SLAP Lesion Repair surgery and the Biceps Tenodesis procedure. The project will consist of sending out a survey to patients who have undergone one of the procedures

over the last 10 years. The questionnaire will ask participants to respond to questions concerning his/her functionality, impairments, pain level, medication use, and if he/she received any other surgical intervention. The data collected will help determine any follow-up needed with patients and give the surgical team insight into how they approach surgical procedures and rehabilitation in the future.

### **[63]** Presenter – Brianna Jackson

Department: Kinesiology and Sport Sciences  
Advisor: Dr. Gregory Brown  
Title: *The Effects of Two Different Pre-Workout Supplements Between Males and Females on 400m Performance and Differences in Salivary Cortisol.*

Nutritional supplements purported to “increase” energy during exercise are commonly used in sports and during regular exercise sessions, particularly in high intensity exercise settings (such as sprinting or weight lifting). These “pre-workout supplements” contain creatine, caffeine, and herbal extracts, which may decrease fatigue and increase muscle strength resulting in an enhanced ability to exercise or compete in sports. Cortisol is a hormone secreted from the adrenal gland that has many effects of metabolism, so measuring salivary cortisol is often used as a marker of stress and metabolic function. PURPOSE: The purpose of this project is to determine whether or not pre-workout supplements alter exercise capacity. METHODS: The effects on salivary cortisol concentrations and 400-meter sprinting performance will be evaluated after the use of two pre-workout supplements, Blitzz and AdvoCare Spark. Sixteen healthy college aged subjects, eight male and eight female, who regularly engage in high intensity

exercise will participate in this project. On three separate occasions the subjects will be given a placebo drink, Blitzz, and AdvoCare Spark in a double blind, randomized, crossover design. Before and 1 hour after the drink salivary cortisol concentrations will be measured. The subjects will then run two timed 400-meter sprints on an indoor track, separated by 10 minutes and salivary cortisol concentrations will again be measured after the second sprint. The results of this research will increase our understanding of whether these pre-workout supplements alter sprinting performance or affect salivary cortisol concentrations. The results will also elucidate if there are gender differences in the response to pre-workout supplements. Collection of data for this project is currently underway.

**(64) Presenter – Skyler Jorgensen**

Department: Kinesiology and Sport Sciences

Advisor: Dr. Matthew Bice

Title: *Motivation of Shoulder Surgery Patients to Rehabilitation*

Motivation is an important factor in describing how individuals meet and obtain desired goals. The current research study aimed to analyze shoulder patients' motivation concerning rehabilitation post-surgery. The purpose of this study is to better understand motivation trends during rehabilitation and identify specific aspects that aid patient motivation. Study participants include shoulder surgery patients at New West Orthopedic Surgery Center. Shoulder patients are required to attend post-operative appointments during weeks 2, 8, 16, and then thereafter, patients will meet with researchers for an additional follow up survey during week 24. Researchers instructed patients how to fill out the rehabilitation motivation survey

(Brown, Miller, & Lawendowski, 1999) after post operation appointments. The current study (n = 21) utilized the Self-Regulation Questionnaire (SRQ) (Brown, Miller, & Lawendowski, 1999) consisting of 63 items measuring self-regulated motivation. Participants were instructed to answer survey questions in relation to their rehabilitation. This study will help professionals understand the connection between motivational factors over time (6 months post-surgery). In addition, motivation will be assessed among gender and previous experience with rehabilitation. Data will enable researchers to construct a motivation mindfulness protocol for physical therapists based on findings that will identify specific areas that can help enhance rehabilitation. The current study started in August 2014, and will continue until August 2015. The proposed presentation will present a research literature review, participant demographics, and preliminary results. The current study will continue through the summer with the Summer Student Research Project. Brown, J. M., Miller, W. R., & Lawendowski, L. A. (1999). The Self-Regulation Questionnaire. In L. VandeCreek & T. L. Jackson (Eds.), *Innovations in clinical practice: A source book* (Vol. 17, pp. 281-289). Sarasota, FL: Professional Resource Press.

**(65) Presenter – Callen Maupin**

Department: Kinesiology and Sport Sciences

Advisor: Dr. Kate Heelan

Title: *Physical Fitness and Academic Performance*

Several recent studies have found consistent positive correlations between physical fitness and academic performance when controlling for socioeconomic status (Rauner, 2013;

Welk, 2013; Wittberg, 2013). However, there are few studies to suggest that improving physical fitness leads to improved academic performance (London, 2011). The purpose of this study is to compare academic performance in math and reading between children who increase or maintain fitness and those who do not based on a Progressive Aerobic Cardiovascular Endurance Run (PACER) fitness score. Methods: Students in grades 3-5 from three low socioeconomic schools completed the math and reading Measures of Academic Progress (MAP) test in the fall of 2013 and spring of 2014. Academic performance was determined based on 2011 Northwest Evaluation Association RIT Scale Norms based on grade level performance. Students were categorized as scoring above or below the grade level average. Physical fitness was measured by the Fitnessgram 10 PACER test in the fall of 2013 and spring of 2014. The PACER test is a 15 meter sprint test where participants run back and forth shuttle style to progressively faster tempos until they miss the count twice. Students were categorized as either “fit” or “unfit” based on the appropriate Healthy Fitness Zones according to Fitnessgram 10. Participants will be categorized into four groups based on the fall and spring PACER scores: unfit to unfit; fit to fit; unfit to fit; and fit to unfit. Comparisons will be made between the change in fitness groups for changes in math and reading scores.

**66**

**Presenter – Ashley Pearson**

Department: Kinesiology and Sport Sciences

Advisor: Dr. Gregory Brown

Title: *Effects of Changes in Resting*

*Metabolic Rate and Diet Due to Stress*

*Throughout a Semester of College*

**BACKGROUND:** College can be a stressful time for students, especially during times when there are many examinations and assignments. Stress levels increase particularly around midterms and finals week. With the increases in stress, students typically increase the amount of food they consume while reducing the quality of their food choices and amount of physical activity. Unhealthy changes in one’s diet and physical activity may reduce the Resting Metabolic Rate (RMR) and increase body fat (%FAT). **PURPOSE:** The purpose of this study was to discern if changes in stress over the course of an academic semester influence RMR and dietary composition in male college students. **METHODS:** Eight male college students ( $21.9 \pm 1.9$  years) were measured for RMR, Body Composition, and a three day diet analysis during the second week of classes (TWO), midterms (MID) and finals (FIN) week. **RESULTS:** There were no differences in RMR between TWO ( $2066.4 \pm 593.9$  kcal/day), MID ( $2168.9 \pm 504.4$  kcal/day), of FIN ( $2061.6 \pm 418.3$  kcal/day). There were no differences in %FAT between TWO ( $18.7 \pm 6.9\%$ ), MID ( $18.5 \pm 7.6\%$ ), of FIN ( $18.7 \pm 4.6\%$ ). However, energy intake was higher ( $P < 0.05$ ) during FIN ( $2831.2 \pm 1220.0$  kcal/day) than TWO ( $2523.4 \pm 753.0$  kcal/day) or MID ( $2466.6 \pm 719.0$  kcal/day). **CONCLUSION:** During period of high academic stress, such as during finals week, these college aged males increased their energy intake by  $\sim 300$  kcal/day, with no

concomitant increase in resting energy expenditure. Although over the course of a single semester there were no changes in body composition, the increased energy intake from “stress eating” could contribute to eventual increases in body fatness.

**(67) Presenter – Shelby Rath**

Department: Kinesiology and Sport Sciences

Advisor: Dr. Kate Heelan

Title: *Parental Perception of BMI Screenings in Schools*

Parental Perception of BMI Screenings in Schools Abstract In the US 22.4% of states require schools to measure height and weight or assess students’ body mass and of those states, 72.7% require the schools to notify parents with the results (Brener et al., 2007). Calculating body mass index (BMI) percentiles for age and gender, and sending this information to parents has been suggested by many health experts as a way to inform parents of their child’s weight status (Institute of Medicine of National Academies, 2004). Purpose: To determine if parents feel it is important for schools to include height and weight in yearly health screenings (BMI). Also, if the parental notification programs increase the intentions of parents to change unhealthy eating and physical activity behaviors. Methods: Parents of 2315 elementary school children were surveyed to determine their perceptions of a school based BMI screening and the notification program in Kearney Public Schools. Results: 484 of parents completed the survey for a response rate of 20.9%. 76.3% of the parents thought it was somewhat or very important to include height and weight as part of their child’s school health screenings and 11.4% did not think it was important. After receiving a BMI

Report Card, 22.5% of the parents have or intend to create a better eating plan at home, decrease TV time, or increase exercise or physical activity. Conclusions: From these results, parents believe that height and weight is an important part of the annual health screenings. Regarding the parent notification programs (BMI report card) one in five parents intend to make healthy changes.

**(68) Presenter – Michelle Reutter**

Department: Kinesiology and Sport Sciences

Advisor: Dr. Megan Adkins

Title: *Factors Influencing Student Enrollment in Non-Mandated High School Physical Education Courses*

Physical education (PE) can increase student involvement in moderate to vigorous physical activity (MVPA) and help high school students gain habits early in life to have the knowledge, attitudes, and skills to engage in lifelong physical activity (Center for Disease Control, 1997 & 2001). High school students staying active in PE classes may help develop lifelong activities for a healthy lifestyle, however, only forty-four states mandate high school PE, with an average of only 1 credit of PE needed to graduate high school (SHAPE America, 2012). Thirty-three states allow students to substitute other activities for PE class credit and only a few states mandate min/week of PE at the HS level (SHAPE America, 2012). Although PE is looked upon as helping students learn about being healthy and active for a lifetime, the amount of time spent in HS PE is minimal. There are five areas of interest that I will be investigating that may effect student enrollment in physical education classes through an online survey. Geographic locations of schools may play a role because it can either limit or provide

resources for the PE department. Another area that may influence enrollment is the state physical education requirements. Student interests and PE courses taught may not coincide together that could influence enrollment and involvement in PE as well. Additionally, teaching styles and methods may contribute to PE enrollment along with support from the school district administration in promoting healthy lifestyles. The purpose of my research will be to determine factors influencing student enrollment in non-mandated PE courses in Midwest high schools. My poster will include an introduction, literature review, an explanation of methodology and expanded information about my research questions.

**(69)** **Presenter – Brian Szekely**  
Department: Kinesiology and Sport Sciences  
Advisor: Dr. Gregory Brown  
Title: *The Effects of Creatine, Sodium Bicarbonate, and Caffeine on Blood Lactate Concentrations During a Wingate Bicycle Test*

Creatine is a widely used nutritional supplement that may enhance the increases in muscle strength due to strength training. Caffeine and sodium bicarbonate (baking soda) can enhance physical performance during strenuous exercise and are also widely used by athletes. “Pre-workout” nutritional supplements are widely used and are purported to lead to more effective exercise resulting greater adaptations. Many pre-workout supplements combine creatine, caffeine, and sodium bicarbonate. However, the efficacy of using creatine, caffeine, and sodium bicarbonate together has not been evaluated. The purpose of this research is to study the effects of creatine, sodium

bicarbonate, and caffeine on blood lactate concentrations and power output during a 30 second anaerobic Wingate bicycle ergometer test in physically active men. **METHODS:** On three separate occasions, after a 2 hour fast, 12 adult male UNK students (19-25 years of age) will have resting blood lactate concentrations measured. Then subjects will either consume either a caffeine + creatine supplement (Blitzz), a caffeine + creatine + sodium bicarbonate supplement (AdvoCare Spark plus Baking Soda), or a placebo in a randomized, double blind, crossover manner. After 60 minutes for digestion and assimilation, the subjects will then engage in a 30 second Wingate bicycle test. During the Wingate test, absolute and relative peak power output, average power output, and the fatigue index will be measured. Immediately following the Wingate test, post-exercise blood lactate concentrations will be measured. Data collection for this project is currently underway. The results from this project will increase our understanding of possible synergistic or antagonistic effects of ingesting caffeine, creatine, and sodium bicarbonate before strenuous exercise.

**(70)** **Presenter – Traci Turek**  
**Co-Presenter – Payton Wragge**  
Department: Kinesiology and Sport Sciences  
Advisor: Dr. Matthew Bice  
Title: *Physical Activity Motivation among Sororities and Fraternities*

The purpose of the current study was to examine relationships between physical activity levels and motivation among active Greek affiliated college students. Research reports that students are significantly less active the first eight weeks of college compared to the last eight weeks of high

school (Bray and Born, 2004). As a result, motivation to exercise can be a potentially crucial aspect to college students' health. Thousands of college students join the Greek system upon enrollment in college; however, limited literature exists examining physical activity motivation among sororities and fraternities, (Markland and Ingledew, 2011). This study is based on the Self Determination Theory, encompassing motivation underlying the likelihood to partake in certain behaviors, such as physical activity (Ryan and Deci, 2000). Study sample included eight different sororities (n=4) and fraternities (n=4) at the University of Nebraska-Kearney campus. Participants (n = 235, fraternity, n = 73; sorority, n = 162) examined physical activity motivation using the revised version of the Exercise Motivation Inventory (EMI-2) (Markland and Hardy, 1993) and self-report physical activity levels (International Physical Activity Questionnaire - IPAQ) (Ainsworth, B. E., et al. 2000). The study reports a significant correlation in physical activity motivation among the constructs of stress ( $r = 0.420$ ;  $p = 0.000$ ), weight management ( $r = 0.419$ ;  $p = 0.000$ ), and appearance ( $r = 0.302$ ;  $p = 0.000$ ) among Greek groups. Results indicate fraternities' rate stress, weight management, and appearance higher than sororities. In addition, sororities present a stronger correlation between competition and physical activity motivation ( $r = 0.735$ ), while fraternities had a stronger correlation between affiliation and physical activity motivation ( $r = 0.326$ ). Greek affiliation can play an important role in college students' lives. The importance of this study could offer insight into creating an effective plan or solution to change or improve health behaviors in the Greek community.

## Management

**(71)** **Presenter – Paige Kordonowy**

Department: Management

Advisor: Dr. Michelle M. Fleig-Palmer

Title: *Physician Recruitment: Is Culture Being Overlooked*

As more people move from rural to urban areas, there is a great concern with the lack of medical personnel in small towns. Rural hospitals are struggling to attract medical staff; therefore, it is important to look at factors that are influencing recruitment. A factor that has been overlooked is not only the organizational culture in rural hospitals, but also the community culture that has a large impact on what life is like in rural areas. The focus of this study is to understand current and prospective physicians' perceptions of community and organizational culture of health care facilities that are located in rural areas. Furthermore, how do these perceptions affect whether a physician is willing to move to a rural setting? Methods included a review of literature and qualitative interviews. A systematic review of peer-reviewed articles was conducted about organizational culture to gain a better understanding of what types of culture are sought after in a working medical environment. Another important factor examined was the kind of culture and lifestyle that prospective medical personnel are seeking. Through the qualitative interviews, the community and hospital cultures were determined. A grounded theory approach was used to identify the culture within a rural town and hospital. Through inductive reasoning, insight was gained about what can be done to make small town life appealing for prospective physicians and their families.

Themes generated from the analysis of the qualitative data will assist health care organizations in increasing awareness of internal and external cultures that influence the recruitment of new physicians to rural health care facilities. The research is significant, because it analyzes how community and organizational cultures have an impact on physician recruitment and retention. Although this research was conducted in the Midwest, findings from this study can be helpful in understanding physician recruitment for medical facilities in other rural regions and countries as well. Findings from this literature review and qualitative interviews allow for a better understanding of how culture is affecting physician recruitment and what can be done to increase the number of physicians who are willing to work in a small town atmosphere.

## Marketing

**(72)** **Presenter – Ru Meng**

Department: Marketing, Supply Chain Management, and MIS

Advisor: Dr. Heather Schulz

Title: *The Comparison of Business Laws Between China and the United States*

This study presents information from secondary research comparing and contrasting the business laws of China with those of the United States. Marketing regulations, employment laws, merges and acquisition rules will be addressed. Different levels of economic development, and different functions of government between China and the United States impact on laws and buying and selling companies will be studied. With the development of China's

economic globalization, more and more economic corporations are transacting business with China. Understanding the diversity of each country's business laws will help American entrepreneurs to navigate cross-country business dealings with China.

## Teacher Education

**(73)** **Presenter – Amanda McClure**

Department: Teacher Education

Advisor: Dr. Donna Montgomery

Title: *The Effectiveness of Using an Assistive Technology Device to Improve Expressive Communication in a Child with Multiple Disabilities*

The majority of individuals can communicate verbally without the assistance of someone to sign for them or the need for a device to speak for them. A less familiar form of communication is by using an Augmentative and Alternative Device (AAC.) As a student enters Special Education, an educational goal for a student who cannot communicate through verbal speech could be communication skills improving through the use of an AAC device. This study entitled, "The Effectiveness of Using an Assistive Technology Device to Improve Expressive Communication in a Child with Multiple Disabilities," shows how effective a particular AAC device is in developing a child's ability to communicate verbally. The single subject who participated in this study is an elementary student with multiple disabilities. This student has a limited vocabulary and the majority of her words are unintelligible. The AAC device represented in this study is the 7-Level Communication Builder produced by Enabling Devices. The results of this project

begin with the 8 IRB applications that were revised and evaluated for approval. The research continues as standard research projects including collecting baseline data as well as intervention data. Currently, this project is still in progress and data is still being collected. However, the Primary and Secondary Investigators anticipate this study to show a positive effect on the student and her ability to communicate using her device as shown through the current data collected.

(74)

**Presenter – Jesse Yentes**

Department: Teacher Education

Advisor: Dr. Martonia Gaskill

Title: *Technology in Rural and Urban Schools: A Comparison Study*

This article examines the availability, use, and integration of technology in rural schools versus technology in urban schools in Nebraska. Data was gathered through interviews with eleven schools in central and eastern Nebraska, seven rural and four urban. Representatives from schools were excited about implementing technology in the classroom but acknowledged a variety of problems ranging from insufficient funding to unwilling teachers. Though several significant differences were noted among availability and training opportunities, much of the data was similar between rural and urban schools. The key similarity found was the passion of educators, administrators, and specialists for the engagement and the individual learning that the implementation technology in the classroom creates.

SOLUTIONS  
TO PROBLEMS  
DEPEND  
UPON  
KNOWLEDGE,  
WHICH ONLY  
RESEARCH  
CAN  
PROVIDE.

— H. KALMBACH

# Graduate Studies



## Counseling and School Psychology

**[75]** **Presenter – Sara Klingelhofer**  
**Co-Presenters – Sara Ramsay, Hannah Vontz, Jessica Estes, and Victoria Mexcur**  
Department: Counseling and School Psychology  
Advisors: Dr. Douglas R. Tillman and Dr. David D. Hof  
Title: *Effective Use of Social Media in Counseling and Counselor Education*

Ways counselor educators can use social media to enhance recruitment, instruction, extracurricular student contact, and alumni connections are discussed, as well as the ethical use of social media in clinical practice as articulated in the 2014 Code of Ethics update. Privacy, confidentiality, informed consent, boundaries, copyright, liability, and free speech issues are outlined as well as a proposed social media policy to assure ethical use of this potent tool. Ways social media can be used to unify the counseling profession both nationally and globally are also provided.

**[76]** **Presenter – Megan Nickel**  
Department: Counseling and School Psychology  
Advisor: Dr. Carmelo Callueng  
Title: *Efficacy of The Delivery of The Online Globalization of School Psychology Course*

School psychology as a profession is recognized in 43 countries (Jimerson, Oakland, & Farrell, 2007) and is seen to capture increasing interest in other countries. The school psychology program at the University of Nebraska at Kearney is one of the few graduate programs that offers a separate course in international school psychology (linked to ISPA resources) that provides opportunities for school psychology/psychology graduate students from different countries to engage in a colloquium about international perspectives of children's well-being and professional training of school psychology across countries. The poster will report data collected for two years on the learning experiences of graduate students from seven countries that participated in the online globalization course. Findings will focus on the teaching-learning modalities that students consider "effective" within their cultural context. In addition, the poster will report the self-report outcomes of self-study modules on child rights for school-based mental health professionals (Nastasi), which is a major component of the globalization course. Participants of this poster presentation will be able to gain knowledge and understanding of the importance of cultural context in the delivery of an international online course and the impact of infusing child rights into the curriculum.

## Kinesiology and Sports Sciences

### **(79) Presenter – Marissa Bongers**

Department: Kinesiology and Sport Sciences  
Advisors: Dr. Kate Heelan, Dr. Todd Bartee,  
and Dr. Bryce Abbey

Title: *Outcomes of a Family-Based Obesity Treatment Program: Consumption of a Low-Fat Diet and Weight Loss*

The prevalence of pediatric obesity in the United States has continued to increase and become one of the leading public health concerns (Physical Activity Guidelines Advisory Committee, 2008). Most dietary approaches for obesity treatment or prevention attempt to limit intake of high-fat, low-nutrient dense foods (Epstein, 2001). **PURPOSE:** To determine the association between changes in high fat food intake and weight loss of participants attending Building Healthy Families (BHF), a 12-week family-based pediatric obesity treatment program. **METHODS:** 66 participants (age:  $10.01 \hat{A} \pm 2.50$  yrs) were educated on the Stoplight Eating Plan developed by Epstein et al. (1980). The Stoplight Eating Plan was used for its easy understanding of colors which are correlated with foods that are low (green), medium (yellow), and high-calorie/fat (red) foods. A red food is categorized as a food with greater than 200 kcal/serving or with greater than 5 grams of fat per serving. The goal for BHF participants was to reduce the number of serving of red foods consumed to two per day by the end of the program. **RESULTS:** Participants decreased number of servings of red foods consumed from  $6.24 \hat{A} \pm 1.48$  servings per day to  $3.24 \hat{A} \pm 1.40$  reds at

### **(77) Presenter – Summer Schmidt**

Department: Counseling and School Psychology

Advisor: Dr. Tammi Ohmstede

Title: *Ethical Issues Reported by School Psychologists in a Midwestern State*

This presentation focuses on ethical issues reported by school psychologists in a Midwestern state. The survey asked respondents whether they had witnessed a number of ethical transgressions and ethical dilemmas. The survey also asked about their ethics training and perceived level of preparedness to handle ethical issues. Attendees will learn whether there is an association between perceived preparedness and level of training, formal training in ethics, or years of experience as a school psychologist.

### **(78) Presenter – Sydney Veskrna**

**Co-Presenter – Meghan McKeone**

Department: Counseling and School Psychology

Advisor: Dr. Carmelo Callueng

Title: *Efficacy of Universal Screeners in Predicting Early Literacy Skills*

With the rising use of universal screeners in schools comes the need for finding measures that are valid and accurate in predicting future academic success. This presentation will report about the research project on the efficacy of universal screeners in predicting early literacy skills of kindergarten students in a rural midwestern school district.

12 weeks and lost  $-5.66 \pm 5.70$  lbs. Change in number of red servings from baseline to 12 weeks significantly correlated with change in body weight ( $r=.828$ ,  $p$

**(80)**

**Presenter – Mitchell Sasek**

Department: Kinesiology and Sport Sciences

Advisors: Dr. Kate Heelan and Dr. Bryce Abbey

Title: *The scheduling of recess and the effect on fruit and vegetable waste in four elementary schools*

Healthy eating and regular physical activity reduces the risk of developing heart disease, cancer, and having a stroke, as well as for certain chronic conditions, such as high blood pressure and type 2 diabetes (CDC 2011). It is crucial that healthy behaviors are established at a young age. Elementary schools need to establish policies that promote healthy behaviors in eating and physical activity. Recent school health guidelines recommend scheduling recess before lunch (CDC 2011). Scheduling recess before lunch can reduce food waste, improve lunchroom atmosphere and improve overall student behavior (Ramstetter 2010, CDC 2011). Bergman et al. (2004) also found that students who had recess before lunch had higher levels of consumption of many macro and micro nutrients. Further, Price (2015) found that moving recess before lunch led to an increase of fruit and vegetable consumption of .16 servings per child, which equaled an increase of 54%. **PURPOSE:** To determine the outcomes of a recess before lunch policy on fruit and vegetable waste in elementary aged students in grades 1-5. **METHODS:** Students at four similar socio-economic schools in Kearney, NE were observed during lunch. Using digital photography, fruit and vegetable

waste was determined by the number of servings selected and by number of servings left on the tray after consumption.

Photography is used because of convenience and low cost but is still useful in assessing tray waste yielding the same statistical results as weighing the food waste, except for chicken nuggets, chicken strips, applesauce and milk (Hanks 2012). Number of fruit and vegetable servings wasted will be compared between students who eat lunch before recess ( $n=111$ ) and students who eat lunch after recess ( $n=89$ ).





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# PERFORMANCE SCHEDULE



## Sandhills Room

1:30 pm — **Hajeong Lee:** *Korean diction for foreign singers* (Advisor: Dr. Sharon O. Campbell)

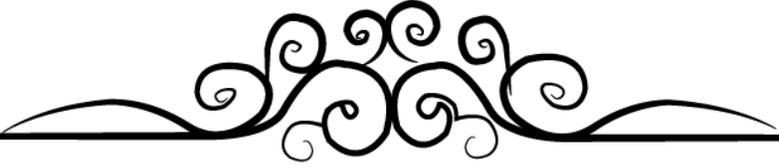
2:00 pm — **Loper Low Brass Ensemble:** *Loper Low Brass Performance at the International Tuba-Euphonium Conference 2014*  
(Advisor: Dr. Seth Fletcher)



I START WITH A QUESTION.  
THEN TRY TO ANSWER IT.

— MARY LEE SETTLE





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# PERFORMANCE ABSTRACT

## Music and Performing Arts



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### **Presenter – Hajeong Lee**

Department: Music and Performing Arts

Advisor: Dr. Sharon O. Campbell

Title: *Korean diction for foreign singers*

My presentation is about Korean diction for foreign singers. There is already standard Korean International Phonetic Alphabet (IPA). However when people whose mother language is Korean pronounce Korean with standard IPA, it sounds very weird. There are so many mispronunciations. For example, ‘ㄱ’ is usually indicated as [k], someone reading [k] would instead pronounce ‘ㅋ’ which can make a totally different meaning. And there is no additional explanation that people should pronounce this [k] much softer than a standard [k]. So I have modified the original IPA in order to correct the pronunciation. I have provided additional explanation of pronunciation exceptions (lenition) so that I can teach how to pronounce Korean like native speakers. Moreover, I would like to

introduce how the Korean alphabet Hangeul was created, who created it, and the scientific principal of Hangeul creation. Finally, I introduce some Korean art songs and let people know how Hangeul sounds in songs and the difficulties inherent in Korean art songs in western—composition style.

**Presenter – Loper Low Brass Ensemble  
Performers – Kenny Baires, Toni Birch,  
Patience Buck\*, Jeremy Eskam, Carlos  
Herrarte, Johnathon Kurth, Mark  
Messner, David Morrison, Vergil Nelson\*,  
Luis Panduro, Brock Persson, Eric  
Rempe\*, Alex Rudolph**

**\* indicates alumni musicians**

Department: Music and Performing Arts

Advisor: Dr. Seth Fletcher

Title: *Loper Low Brass Performance at the  
International Tuba-Euphonium Conference  
2014*

The International Tuba-Euphonium Conference (ITEC) is the premier event of the International Tuba-Euphonium Association (ITEA), a professional organization for low brass musicians. The Loper Low Brass Ensemble was invited to perform an hour-long program at ITEC 2014 held at Indiana University from May 19-24. This endeavor was made possible in part by funding from the UNK Undergraduate Research Council, the

UNK Department of Music and Performing Arts, and the tremendous efforts of members of the High Plains Chapter of ITEA and the UNK Chapter of the International Trombone Association. For today's program, the Loper Low Brass Ensemble will be performing works from their recent performance at the Southwest Regional Tuba-Euphonium Conference in Grants, NM and discussing their experiences at ITEC 2014.





# ORAL PRESENTATION SCHEDULE

## Room: Ponderosa C

- 1:30 pm — **Rachel Wemhoff**: *Women in Science: An analysis of why women choose science-based careers and how society influences that choice* (Advisor: Dr. Linda Van Ingen)
- 1:45 pm — **Stefani Perez-Zamarripa**: *Racial Diversity: An Analysis of Its Effects on Social Capital in Select Nebraskan Communities* (Advisor: Dr. Joan Blauwkamp)
- 2:00 pm — **Alysha Daley**: *Women's Education in Developing Countries* (Advisor: Dr. Charles Rowling)
- 2:15 pm — **Mariah Kimble**: *Pixar and SAS: Best Practices to Enhance Motivation and Creativity* (Advisor: David Palmer)
- 2:30 pm — **Sarah Ahrens**: *Examination of Materialism within the Brand Community Framework* (Advisor: Dr. Heather Schulz)
- 2:45 pm — **Kaley Hodgen**: *Big 5 Personality Traits: Forming a Relationship with Clients* (Advisor: Dr. Michelle Fleig-Palmer)

## Room: Ponderosa D

- 1:30 pm — **Estrella Monrroy**: *Rickettsia Rickettsii* Prevalence in *Dermacentor Variabilis* in Dawson County, Nebraska (Advisor: Dr. Julie Shaffer)
- 1:45 pm — **Alyssa Blair**: *Measuring Binding Interactions between HSA and Atrazine and Desethylatrazine Using High Performance Affinity Chromatography* (Advisor: Dr. Annette Moser)
- 2:00 pm — **Anthony Donovan**: *Measuring Binding Interactions Between HSA and Hydroxyatrazine and Deisopropylatrazine Using High Performance Affinity Chromatography* (Advisor: Dr. Annette Moser)
- 2:15 pm — **Jorge Vera Chavez**: *Social orientation and instructional practices of Peruvian Foreign Language Teachers* (Advisor – Dr. Chris Jochum)
- 2:30 pm — **So-Young Chun**: *English language musical theatre and Korean musical theatre* (Advisor – Dr. Sharon O. Campbell)
- 2:45 pm — **Holly Kosanovich**: *Gestures of Older Adults During Emotional Recall* (Advisor – Dr. Erin Bush)

## Room: NSU 312

- 2:00 pm — **Yentle Dyas**: *The Rise of the Romantic Period Anti-hero and his Decent from Milton's Satan* (Advisor: Dr. Denys Van Renen)
- 2:15 pm — **Shaun Friedrichsen**: *Accepting the Bitter Reality* (Advisor: Dr. Christie Maloyed)
- 2:30 pm — **Chloe Johnson**: *Making the Invisible Visible: Sylvia Plath & Mental Illness in the Mid-20th Century* (Advisor: Dr. Susan Honeyman)
- 2:45 pm — **Jonathan Johnson**: *Knights, Motorcycles, and Rebels: Knightriders as a Revision of the Arthurian Ideal* (Advisor: Dr. Rebecca Umland)
- 3:00 pm — **Marrissa Nutter**: *Homo electricus: Technology and Humanity in Twentieth Century Literature* (Advisor: Dr. Megan Hartman)
- 3:15 pm — **Amanda Slater**: *Teaching 'Anne Frank: The Diary of a Young Girl': A societal tradition worth examining* (Advisor: Dr. Marguerite Tassi)



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# ORAL PRESENTATION ABSTRACTS

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## Biology

**Presenter – Estrella Monrroy**

Department: Biology

Advisor: Dr. Julie Shaffer

Title: *Rickettsia Rickettsii Prevalence in Dermacentor Variabilis in Dawson County, Nebraska*

*Dermacentor variabilis*, also known as the American dog tick, is found throughout most of the United States east of the Rocky Mountains. *D. variabilis* ticks are a common vector of *Rickettsia rickettsii*, the causative agent of Rocky Mountain Spotted Fever. To date, very little is known about the risk of contracting RMSF from *D. variabilis* ticks in Nebraska. Therefore, the aim of this study was to determine the prevalence of *R. rickettsii* in adult male and female *D. variabilis* ticks collected from Dawson County, NE. Adult female ticks require a large bloodmeal to successfully reproduce, while adult male ticks rarely attach and feed on mammalian hosts. Therefore, we hypothesized that females would have a higher prevalence of infection with *R. rickettsii* compared to males. DNA was extracted from one hundred thirteen

females and 55 males, and was tested by PCR for the presence of *R. rickettsii*. PCR results showed that 41% of females and 20% of males were positive for *R. rickettsii*. These data support the hypothesis that the prevalence of *R. rickettsii* is higher in females than males. It also suggests that the prevalence of *R. rickettsii* is higher in Nebraska than other states. With these data Nebraska residents can be made aware of the risk of RMSF following exposure to *D. variabilis* tick bites.

## Chemistry

**Presenter – Alyssa Blair**

Department: Chemistry

Advisor: Dr. Annette Moser

Title: *Measuring Binding Interactions between HSA and Atrazine and Desethylatrazine Using High Performance Affinity Chromatography*

Human serum albumin (HSA), the most abundant transport protein in blood, has the ability to bind a wide variety of solutes including herbicides. Although numerous studies have examined the interaction with

drugs with HSA, very few have focused on the binding between herbicide and herbicide metabolites and HSA. Atrazine and some of its metabolites are often found to contaminate ground water and have the potential to bind HSA and be transported throughout the human body. In this study, frontal analysis, a subset of high performance affinity chromatography (HPAC), was used to measure the binding constant between HSA and atrazine and HSA and desethylatrazine.

**Presenter – Anthony Donovan**

Department: Chemistry

Advisor: Dr. Annette Moser

Title: *Measuring Binding Interactions Between HSA and Hydroxyatrazine and Deisopropylatrazine Using High Performance Affinity Chromatography*

Human serum albumin (HSA), the most abundant transport protein in blood, has the ability to bind a wide variety of solutes including herbicides. Although numerous studies have examined the interaction with drugs with HSA, very few have focused on the binding between herbicide and herbicide metabolites and HSA. Atrazine and some of its metabolites are often found to contaminate ground water and have the potential to bind HSA and be transported throughout the human body. In this study, frontal analysis, a subset of high performance affinity chromatography (HPAC), was used to measure the binding constant between HSA and hydroxyatrazine and HSA and deisopropylatrazine.

## English

**Presenter – Yentle Dyas**

Department: English

Advisor: Dr. Denys Van Renen

Title: *The Rise of the Romantic Period Anti-hero and his Decent from Milton's Satan*

The Romantic period's anti-hero finds his qualities in John Milton's Satan from his epic poem, "Paradise Lost". This project explores three popular anti-heroes, Emily Bronte's Heathcliff from "Wuthering Heights", Charlotte Bronte's Mr. Rochester from "Jane Eyre" and Mary Shelly's Victor Frankenstein from "Frankenstein". This presentation will also explore the influence that John Milton's "Paradise Lost" has on William Blake's epic poem, "Milton", which takes the opposite view of the other authors discussed here. This project will explore not only Satan's influence on each of these anti-heroes, but also the plot of "Paradise Lost" and its influence on the plots of these classic novels and poems. Milton's influence on the Romantic period is evident in the works of the time period and in the characters that come from them.

**Presenter – Shaun Friedrichsen**

Department: English

Advisor: Dr. Christie Maloyed

Title: *Accepting the Bitter Reality*

Finding meaning in this world is an issue that is hard to overcome. The all but forgotten poetry of Stephen Crane appears to be a guide to this very quest. In the poems "I Saw a Man Pursuing the Horizon" and "In the Desert," Crane reveals his negative view of idealism and shows that, even if it is bitter, people must accept reality. Accepting the nature of life is how Crane chooses to pursue his goals in life. If one examines these poems, he or she can

draw a deeper meaning from life and a sense of appreciation that an idealistic world view is not able to produce. This examination of the poetry of Stephen Crane provides readers the argument as to why we must seize life in the moment and not let it slip away by waiting for good things to come.

**Presenter – Chloe Johnson**

Department: English

Advisor: Dr. Susan Honeyman

Title: *Making the Invisible Visible: Sylvia Plath & Mental Illness in the Mid-20th Century*

Sylvia Plath is among a long list of authors and poets that have or still do suffer from mental illness and/or depression. Those who suffer from these conditions are plagued with the fact that their disabilities are not physical. But, there is no reason to believe that mental disabilities are any less debilitating or less serious even though the disability is not tangible. My research focus was on the spaces that Plath and others with mental illness inhabited and used the spaces to tell a story. The views on mental-illness pre-Plath and even to this day still carry a very heavy negative-connotation and the research looked at that as well. There are many abandoned mental institutions around the country along with some still in service such as the McLean Hospital where Sylvia Plath herself stayed. The Hastings Regional Center, which is now mostly closed down, is one of the oldest institutions here in the state of Nebraska and I was able to walk the spaces that patients walked and take photos. Through my research I hope to broaden the awareness of mental illness and its affects not only on the individual but people and spaces around them, making the invisible visible.

**Presenter – Jonathan Johnson**

Department: English

Advisor: Dr. Rebecca Umland

Title: *Knights, Motorcycles, and Rebels: Knightriders as a Revision of the Arthurian Ideal*

The medieval Arthurian legend has enjoyed continued popularity, constantly being adapted or changed for the likes of modern audiences. In Malory's "received legend," *Le Morte D'Arthur* (1485), Arthur and his fellowship of knights are new upholders of a new law, going against the old norms of their society. In this sense they are subversive, attempting to establish a Utopian world to replace the old corrupt model of feuding, factionalized warlords. The film *Knightriders* (1981), written and directed by George Romero, is set in contemporary post-60's America, but it features the quasi-Arthurian rebellious nature under the leadership of Billy, who we will come to see as a stand in for Arthur. This facet of the legend, I will argue, is at the heart of the continued popularity of the legend—one which displays its mythopoeic nature. Although released in 1981, *Knightriders* invokes a number of issues that were present (some still are present) in America in the 1960's. The film follows a motorcycle group that performs a traveling medieval fair. At each fair the band of misfits "reenacts" jousting tournaments using their motorcycles as horses. Though most of the props are just for show (made of cardboard and Styrofoam), the jousts themselves are quite real. A group of jousters fights for Billy (Ed Harris) who holds the crown and is king (in the literal sense) of the entire troupe, while another group fights under Morgan (Tom Savini) for Billy's crown. Traveling from one small town to the next, the troupe gets by with the money they make from each show. Subversive in their lifestyle—itinerant

performers and drop-outs who try to create their own democratic family —the troupe soon becomes divided by the introduction into their culture of the very things Billy has tried to rebel against: money, corruption, and fame. As his actions throughout the movie show, Billy lives up to a higher principle —one that holds true from the Arthurian legend. Romero makes it clear that Billy is not fond of the way his society acts and thinks. Throughout the movie, Billy repeatedly shows his disapproval in capitalism and materialism, which he sees as being highly prevalent in the society he lives in.

**Presenter – Marrissa Nutter**

Department: English

Advisor: Dr. Megan Hartman

Title: *Homo electricus: Technology and Humanity in Twentieth Century Literature*

As humanity rockets forward into the most rapidly advancing technological revolution our species has ever encountered, the danger is posed not only that computers will begin to think like men, but that men will begin to think like computers. Popular literature published on the dynamics of human-technology interactions throughout the twentieth century reflects a deep societal fear that technological advancement beyond a certain bound will inevitably result in a redefinition of what it means to be alive and ultimately the destruction of the human race. This study uses Isaac Asimov's 1950 publication *I, Robot* to provide the fundamental principles for understanding human-technology interactions, specifically human-robot interactions, as perceived at the exact midpoint of the 20th century. Fortification of Asimov's theories are provided through the examination of four additional texts: Thea von Harbou's *Metropolis* (1927), William Gibson's

*Neuromancer* (1984), Arthur C. Clarke's *2001: A Space Odyssey* (1968), and Philip K. Dick's *Do Androids Dream of Electric Sheep?* (1968). These works serve to demonstrate the gross misunderstandings associated with scientific advancement in the technological sector, in addition to providing various outlooks on the predicted political, social, and economic repercussions of pursuing technological advancement to no determinate end. Ultimately, this project uses these selected texts in conjunction with a number of scholarly works to illustrate the possibilities facing humanity's evolutionary journey and the introduction of a post-human collective. Twentieth century literature reflects a prevalent and growing fear of the potential of humanity being redefined and eliminated at its base-roots as a result of technology advanced too far.

**Presenter – Amanda Slater**

Department: English

Advisor: Dr. Marguerite Tassi

Title: *Teaching 'Anne Frank: The Diary of a Young Girl': A societal tradition worth examining*

Since the publication of "Anne Frank: The Diary of a Young Girl" in the late 1940s, English teachers across the country have come to rely on the Frank family tale in their conversations with students about the Holocaust. This begs the question as to why Anne Frank is so attractive in the eyes of teachers, adolescents, and scholars - just as prominently today as in the past. Looked at from the perspective of the classroom teacher, Anne Frank's life - and the Holocaust in general - offers a timeless lesson of moral clarity or the distinct recognition of enemies, victims, and heroes during the war. As for adolescents, the diary not only presents information regarding the historic event but is

relatable in its explanations of both physical and emotional changes throughout puberty. On a scholarly level, the written work is beautifully done - a true testament to Anne Frank's literary capacities. The potential downfalls of this curriculum abound, however, as only one side of the story is being told; for instance, life outside the Secret Annex is rarely mentioned. In order to curb these effects, it is the duty of middle and secondary school teachers to present "Anne Frank: The Diary of a Young Girl" in an alternate manner. These alternatives include, but are not limited to, using a variety of Holocaust texts alongside the diary, explaining Anne Frank's life prior to and after the diary entries, and delving into the controversy behind the text. In doing so, society's students will be empowered to question and make hard decisions in regard to the Holocaust and all of its complexities.

## Management

### **Presenter – Kaley Hodgen**

Department: Management

Advisor: Dr. Michelle Fleig-Palmer

Title: ***Big 5 Personality Traits: Forming a Relationship with Clients***

Forming relationships with a new client can be an unnerving experience for accountants. This paper presents a model that can help accountants form strong and lasting relationships with their clients. The first step is for the accountants to look at themselves and see whether they have a high or low level of instrumentality, which is how strong the accountants see the relationship between what they are doing and the reward. What the accountants are doing is making a relationship with the client and the reward is what the relationship turns out to be. The next step is

for the accountants to look at the client and see what job he or she has. Once the accountants know what job the client has, the accountants can assume the personality of the client based on his or her job. The following step is for the accountants to impression manage, and this depends on their level of instrumentality. Impression management is the process the accountants go through to control the impression their clients have of them, and there are two parts to this: impression motivation and impression construction. Impression construction, the accountants emphasizing characteristics about themselves to the client, only takes place if the impression motivation, wanting to come across a certain way, is high enough. The last step is to actually form a relationship with a client based on the client's job. If these steps are executed properly, accountants can expect to form long-lasting relationships with their clients.

### **Presenter – Mariah Kimble**

Department: Management

Advisor: Dr. David Palmer

Title: ***Pixar and SAS: Best Practices to Enhance Motivation and Creativity***

Approximately, seven out of ten Americans highly dislike their jobs according to various surveys of employee attitudes. However, leading companies such as Pixar and SAS have reversed this statistic by implementing innovative practices that motivate employees and increase creativity. Pixar is a computer animation company that is a division of Walt Disney and is well known for its films such as Toy Story, Monsters, Inc., and Finding Nemo. SAS is a computer software company based in North Carolina that develops business intelligence and advanced analytics. Both companies have been successful in enhancing the motivation and creativity of their

employees through the use of industry best practices. Some successful techniques that they have used include designing physical layouts that facilitate employee interaction, and adding on-site amenities (e.g., day care, medical services) that remove distractions and interruptions. By using these practices, it is estimated that Pixar and SAS have saved thousands of dollars a year by reducing employee absenteeism and turnover, and increasing employee engagement.

## Marketing

**Presenter – Sarah Ahrens**

Department: Marketing, Supply Chain Management, and MIS

Advisor: Dr. Heather Schulz

Title: *Examination of Materialism within the Brand Community Framework*

As the concept of brand communities continues to be a vital area of study for market researchers, overlapping areas of analysis have become increasingly helpful in understanding the social and interpersonal implications of brand communities.

Measuring materialism and observing the effects of this value within brand communities is one way the connection between these two concepts may be evaluated. A significant amount of research provides a thorough knowledge base on which to make further inferences on brand equity from the consumer's standpoint within a brand community. The terror management theory enables us to more clearly understand, the psychological motivators for consumers who exhibit materialistic tendencies. Questions that evaluate an individual's level of fear or insecurity are included in the research to assist in guiding conclusions from this area of interest. The goal of this discussion is to shape

an understanding of how materialism may play an active role within the membership and functioning of brand communities, and how this affects individual consumption habits. Social approval, self-clarity, and happiness are just a few of the measures used to build a picture of how materialism plays a role in brand community involvement by consumers. An electronic survey was distributed to students at the university that included established marketing research scales. By using Nike as an example of a brand that most respondents were familiar with, participants in the survey research were able to reflect on their feelings and actions towards the particular brand. Conclusions drawn include strong correlations between respondents placing social value on a brand and the level of involvement with that particular brand. A higher level of brand involvement was also strongly correlated with a higher level of overall anxiety. Respondents who placed more social value on a brand reduced the amount of emotional value invested in that particular brand.

## Modern Languages

**Presenter – Jorge Vera Chavez**

Department: Modern Languages

Advisor: Dr. Chris Jochum

Title: *Social orientation and instructional practices of Peruvian Foreign Language Teachers*

This session will present the results of a study conducted in Lima, Peru that used the Singelis Scale to determine the individualistic or collectivistic personalities of English foreign language teachers in order to account for their instructional preferences.

# Music and Performing Arts

## **Presenter – So-Young Chun**

Department: Music and Performing Arts

Advisor: Dr. Sharon O. Campbell

Title: *English language musical theatre and Korean musical theatre*

My Presentation is about the influence of English musical theatre on Korean musical theatre. The first part is about how musical theatre was created and developed through many previous genres. In my presentation I provide some historical background information from opera and operetta through musical theatre. The second part introduces Korean musical theatre. I researched Korean musical play forms and English language musical theatre forms in Korean musical theatre. Korea had its own musical theatre forms before the English language musical came to Korea. I will introduce these forms. Korean musical theatre was very quickly and highly developed after the English language musicals' inflow, so I present how Korean musicals were changed and developed. I show that Korean musicals are divided into three types, Import, License, and Creative musicals. I explain about those three Korean musical forms. Finally, I would like to present how I believe Korean musicals need to grow in order to become world famous musicals.

# Political Science

## **Presenter – Alysha Daley**

Department: Political Science

Advisor: Dr. Charles Rowling

Title: *Women's Education in Developing Countries*

This study outlines the educational disparity that women are faced with along with some of the leading causes of the disparity. It also examines some of the international institutions that have influence over the issue or are currently working on combating it. The study gives an in depth look into three regions- Pakistan, Kenya, and the indigenous women of Latin America- to show how these disparities are not centralized to one region. These three regions were used to compare and contrast how education for women is being treated in different areas along with any changes that have occurred in recent years. Within the examination of both Pakistan and Kenya there will also be information regarding specific women within their countries that have fought to promote education. The study presents alarming statistics and highlights the economic, societal, and individual benefits of educating women.

## **Presenter – Stefani Perez-Zamarripa**

Department: Political Science

Advisor: Dr. Joan Blauwkamp

Title: *Racial Diversity: An Analysis of Its Effects on Social Capital in Select Nebraskan Communities*

The relationship between racial diversity and social capital (community involvement) has been the subject of research studies such as Robert Putnam's *E Pluribus Unum: Diversity and Community in the Twenty-first Century*

(2006) and Christel Keslter and Ireme Bloemradd's Does Immigration Rode Social Capital? The Conditional Effects of Immigration-Generated Diversity on Trust, Membership, and Participation across 19 Countries (2010). The study concludes that a community or individual's level of social capital, whether it is low or high, is an indirect result of the community's level of racial diversity. This particular research attempts to replicate the methods used by the two mentioned studies to see if in select Nebraskan communities, racial diversity has an impact on social capital. Through survey work, this project measures three vital areas of social capital: civic engagement, political engagement, and trust. The Nebraskan communities of Lexington, Schuyler, Fremont, and Wakefield were chosen as the participant communities based on their known levels of racial diversity in relation to other surrounding communities. Following the results of Putnam and Bloemradd, this study hypothesizes that the higher a community's level of racial diversity is, the lower an individual's or community social capital index will be.

## Women's and Gender Studies

**Presenter – Rachel Wemhoff**

Department: Women's and Gender Studies

Advisor: Dr. Linda Van Ingen

Title: *Women in Science: An analysis of why women choose science-based careers and how society influences that choice*

This project is focused on the experiences of women who choose to pursue careers in science, a traditionally male-dominated field. Particular emphasis is placed on the lives

women in health sciences and biological sciences. An oral history methodology involving interviewing three women with experience either as a healthcare provider or scientific researcher is utilized for this research. This project is significant because it sheds light on why women choose careers in science and how societal norms can impact their choice, which can be useful in developing ways to increase the interest of young women in science.



RESEARCH IS  
TO SEE WHAT  
EVERYBODY  
ELSE HAS  
SEEN, AND TO  
THINK WHAT  
NOBODY ELSE  
HAS  
THOUGHT.

— ALBERT  
SZENT-GYORGYI





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# GRADUATE STUDIES ORAL PRESENTATION ABSTRACTS



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## Communication Disorders

**Presenter – Holly Kosanovich**

Department: Communication Disorders

Advisor: Dr. Erin Bush

Title: *Gestures of Older Adults During Emotional Recall*

The present study concerns gesture patterns of older adults (over the age of 65) during positive-emotional recall tasks. We employ two tasks related to emotional recall — one that is personally-relevant, and one that is not — in order to view the gesture differences of older men and women. Researchers viewed audio-video tapes of individuals speaking about a personally-relevant task and a non-personally relevant task, and determined gesture classification, frequency, trajectory, affiliation, and saliency. Results showed that gesture type, frequency, and saliency, even in an age-specific population, is highly individualized; however, some conclusions can be drawn from this study including that

emotional gestures are lexically affiliated and follow the trajectory of the metaphorical-spatial verb that is used in speech. If researchers can determine typical patterns of gesture in men and women, comparisons can be made when looking at the gestures of individuals with neurological impairments such as CVA and TBI.

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RESEARCH IS  
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IT IS POKING AND  
PRYING WITH A  
PURPOSE.

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