20TH ANNUAL

Student Research Day

MARCH 28TH, 2018

UNIVERSITY OF NEBRASKA UNK KEARNEY

Schedule of Events

Wednesday, March 28, 2018

7:30 am to 9:00 am..... Students set up posters in Pondersoa 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, Charles E. Sepers, Jr. M.A., M.P.H. in rooms Ponderosa A & B

1:30 pm to 3:45 pm..... Oral Presentations
Open Poster Viewing

3:45 pm..... Awards Ceremony & Reception in rooms Ponderosa A & B

Guest Speaker

Charles E. Sepers, Jr., M.A., M.P.H.

Chuck Sepers completed his Bachelor of Science degree at the University of Nebraska at Kearney in Psychology and Exercise Science and both his Master of Public Health and Master of Arts in Behavioral Psychology with an emphasis in community health and development at the University of Kansas. Broadly, his research is focused on understanding and improving conditions that contribute to health and well-being using community-based participatory evaluation research, particularly among traditionally underserved populations experiencing health disparity. Chuck is currently the evaluation project coordinator for both the Missouri Foundation for Health's Healthy Schools, Healthy Communities initiative, an ecological approach to preventing childhood obesity in urban and rural Missouri; and the Platte County Lifestyles Coalition Capacity Development initiative funded by UNK's Rural Futures Institute, an effort to build capacity for obesity prevention and treatment through training and technical assistance in Platte County Nebraska. Recent publications include those related to healthcare systems approaches to diabetes self-management education and evaluating the World Health Organization's effort to bend the curve on Ebola-related mortality during the 2015 Ebola outbreak in West Africa.

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Poster Abstracts

Fine Arts & Humanities

Communication

Poster 1 – Matthew Fischer
Mentor: Sonja Bickford
Title: *Developing and Testing of K-12 Aquaponics Curriculum*

Aquaponics is the combining of aquaculture and horticulture that is sustainable and discharges less waste than other methods (Lennard, 2004). Being portable and sustainable, easily portable aquaponics systems have during the past decade been implemented into classrooms, giving more hands-on ways of teaching agricultural methods, biological systems, etc. In this project, we aim to identify and create a curriculum that can be paired with the in-classroom aquaponics system to best utilize the systems in a k-12 setting. The overarching question of the study is to write and test a curriculum to be used with the systems to identify what curriculum best pairs with ongoing in classroom instruction and what the students respond best to. The planned deliverable of the project will be a set of k-12 aquaponics curriculum and lesson plans.
In order to identify the benefits of the systems paired with the curriculum, observations will be conducted in middle school classrooms in order to observe the level of attentiveness and changes to classroom dynamics changes during the lesson(s) where aquaponics systems are utilized as part of the lesson. This 3-year project is currently in the literature and curriculum writing phase and an IRB will be submitted during this spring 2018 semester for the observational portion of the study.

Poster 2 – Emma Lee
Mentor: Sonja Bickford
Title: *Assessment and Modes of Application of Aquaponic Systems in Classrooms*

Aquaponics is the combination of aquaculture and hydroponic technology to grow both fish and plants together in a closed-loop system. While aquaponics can play a role in increasing food security, it may also be a potential educational tool because of its interdisciplinary nature (Heart 2013, pg 7). Systems come in many sizes and styles with providing users the choice of size, colors, sound levels, and food production along with the health, well being, and educational benefits. In this project, we aim to identify the physical, mental, and overall benefits of aquaponics systems in K-12

classrooms. The study's main question is to identify the benefits of aquaponic systems for elementary aged children, with a deliverable result of a marketing plan to get more systems into k-12 classrooms.
To identify the benefits of the systems in classrooms anonymous observations are being done in second and fourth grade classrooms, looking specifically at the differences in classroom dynamics of classes with verses without systems. The results of the observations will be analyzed through a thematic analysis based on benefit categories. Along with observations a survey is being conducted with teachers in classrooms with and without the systems. The surveys are designed to provide additional data regarding the system as a tool for classroom management for teachers as well as getting the teachers perspectives on the specific mental benefits and physical benefits for the children, which will be compared to the observation data. Planned project deliverables will be a marketing plan of aquaponics systems for elementary schools along with a peer reviewed journal article and presentation at an academic conference.

Poster 3 – Zach Sullivan
Mentor: Sonja Bickford
Title: *Analysis and comparison of solar net metering policies and best practices between Arctic and Non-Arctic states and countries*

While Nebraska makes the inevitable transition to increased renewable solar energy consumption, the policies in place should be evaluated. One area of policy that cannot be overlooked is the Nebraska Net Metering Policy. Net metering is a billing arrangement that allows businesses and individuals generating their own electricity to deliver unused energy back to their local power grid and to receive a credit for that energy. The vast majority of electricity generating systems around the world use the default method of net metering to account for the generation supplied to the grid from rooftop solar panels. The concept is simple, but has complex issues. The main issues to be examined in this study are the credit structure for energy supplied back to the grid, destabilization of the grid, and rate inequalities. Currently, Nebraska operates using a fixed fee equal for customer-generators and customer-nongenerators. Net metering structures vary from state to state as different pricing and purchase agreements are being utilized and evaluated. By comparing our current system in Nebraska and different parts of the United States to strong international net metering practices the United States can establish a robust policy. Net metering issues must be approached carefully as a strong economy and the health and safety of citizens are dependent on a reliable energy grid.
This project has two phases:
1. Compare the state to state net metering policies to determine examples of best practices within the United States
2. Compare the United States policies and practices to Arctic countries to determine examples of best practices
The results of this study will provide insight for policy makers and those interested in producing solar energy.

English

Poster 4 – Emily Hemmer
Mentor: Marguerite Tassi
Title: *Religion in Game of Thrones and Shakespeare's First Tetralogy*

As established by previous research, there lies extensive thematic, character, and plot connection between the two English history tetralogies of Shakespeare and the television series Game of Thrones. By choice and concomitantly with the medieval setting, the second tetralogy and Game of Thrones share a particular thread of connections in regards to religious dogma, hierarchy, and practice. This research will examine the similarities between Medieval Catholicism along with the transition into Anglican England and the fictional Faith of the Seven. George R.R. Martin created the Faith of the Seven with Medieval Catholicism in mind, incorporating the symbol "seven" in the seven figures that represent important theological thinking. One of the major plot devices throughout the fifth and sixth seasons of Game of Thrones centers around religious uprising and persecution of the heads of state for their sins. In this way, the series is calling back upon the historical time period which inspired it, the Wars of the Roses, and portraying the Protestant Reformation. Game of Thrones primarily uses religious context to further plot and conflict during a lapse in the series. Shakespeare, however, was forbidden by the Royal Proclamation of 1559 to produce any play dealing with the matter of religion. Though there is evidence this Proclamation was largely ignored, many historians would argue that Shakespeare was largely unconcerned with matters of religion. His plays instead focus on the morality of characters within a strictly religious society, and are biased according to Anglican accounts of historical events. This research attempts to dive further into this issue by analyzing certain characters (Bishop of Winchester, High Sparrow), events and passages (murder of Clarence, death of the Bishop of Winchester and Joan la Pucelle) as well specific instances of language that reflects religious convictions.

Poster 5 – Tiffany Vavricek
Mentor: Susan Honeyman
Title: *The Adventurous Monster*

Over the past school year, I have worked with Dr. Susan Honeyman on my undergraduate research project to write a children's book. The main plot of the book is that a monster goes on an adventure around the world and learns a lot while he's away. I have drawn a lot of inspiration for this book from other books, such as Where the Wild Things Are by Maurice Sendak and The Adventures of Beekle: The Unimaginary Friend by Dan Santat.
My two learning objectives for this project were the following: 1) To increase my knowledge of what makes a children's book successful through research; 2) To write a publishable children's book. In order to achieve the first learning objective, I have read many children's books and looking into commonalities between popular children's books that are beloved by children and parents alike. To reach my second learning objective, I have been working on writing the book itself and plan on having a publishable

manuscript done by the end of this semester.

Music & Performing Arts

Poster 6 – Tierney Casper
Mentor: Sharon Campbell
Title: *Swimming Lessons, Autism, and the Benefits of Music*

Pending IRB approval, I will be teaching six swimming lessons to a child with Autism. In these swimming lessons I will use musical and non musical activities to determine if the musical swimming activities enhance and improve the learning process for the child with Autism. I believe that by including music in a swimming lesson this student and other students with disabilities will better understand the task of swimming and exhibit calmer behavior in their lessons. My student research day poster presents the research that supports my theory as well as my lesson observations.

Behavioral & Social Sciences

Communication Disorders

Poster 7 – Rachel Beck
Mentor: Mickey Langlais
Title: *"Can you hear me now?" Examining the role of social media with romantic relationship development with individuals with a speech and language disorder*

Individuals with speech or language disorders (SLD) report difficulties with social and emotional functioning (Craig, Blumgart, & Tran, 2009), which is likely to impede the ability to form and maintain romantic relationships. One study found that adolescents and young adults view peers who stutter as less attractive and these participants also stated that they were less likely to initiate and maintain a relationship with a peer who stutters (Borsels, Brepoels, & Coene, 2011). However, the advent of social media may ease the formation of romantic relationships, as social media contributes to relationship formation and maintenance (LeFebvre, Blackburn, & Brody, 2015). Thus, the goal of this study is to see if young adults with a speech or language disorder are more likely to use social media to initiate and maintain romantic relationships. Shyness and self-esteem will also be examined as potential covariates. Both quantitative and qualitative data were collected from 170 emerging adults, with 19 reporting some form of speech or language disorder (fluency disorder, articulation disorder, auditory processing disorder, and hearing impairment). Quantitative data via independent t-tests revealed that SLD participants reported significantly more time on Instagram and SnapChat compared to no-SLD participants. Additionally, SLD participants were significantly more likely to agree that social media helps when interacting with potential partners compared to no-SLD participants, although there were no differences between whether or not participants actually used social media when communicating with potential partners. Qualitative data revealed that SLD participants are motivated to use social media with the relationship formation process because it's easier and convenient, it increases confidence, and it helps them alter who they really are. This research provides insight about how young adults with a SLD initiate romantic relationships. Additional implications for social media and romantic relationships will be discussed.

Economics

Poster 8 – Courtney R. Leitner
Mentor: Sonja Bickford
Title: *Cost Benefit Analysis of Small-Scale Aquaponic Systems*

Aquaponics is the process of removing fish waste through a filtration system. This filtration system converts the waste into nutrients that are beneficial to both plants and fish. The process is completed

through the continuous recirculation of water from a flood tank into a grow bed, then into the tank that homes the fish. This process consists of a combination of hydroponics and aquaculture. Through aquaponics the negative aspects of both hydroponics and aquaculture are turned into positives when they are combined. The majority of the research conducted on aquaponics systems has been on commercial sized systems; and the benefit is measured by the amount of fish/plants they can produce. Therefore, the purpose of this project is to analyze the costs versus the benefits that a small-scale (5-10 gallons) aquaponics system can provide. During the project the benefit values of both tangible and intangible benefits of the small-scale aquaponics system will be identified and calculated as there is not a lot of monetary benefit from the fish and plants yields, but benefits can come from the overall wellbeing, feeling of happiness, and physical activity from maintain the system. This project is currently in the data collection and analysis phase and will be followed up with a deliverable of a peer reviewed publication and presentation of the study's results which will be applicable to anyone interested in implementing a system in their homes, offices, or institutions.

Family Studies & Interior Design

Poster 9 – Maria Diaz
Mentor: Toni Hill
Title: *Child Health: Examination of Doula and Lactation Services*

I am examining Lactation and Doula Services nationally. I am looking at certifications, credentialing, and trainings that contribute to mother and child health. Doula services begin before birth and Lactation services begin at birth and continue trough early childhood.

Poster 10 – Allison Kiolbasa
Mentor: Sharon Obasi
Title: *Of Kith and Kin: Naming Patterns in Perkins County, Nebraska*

Namesaking, the practice of naming a newborn after a relative may be viewed as a unique form of advertising; a way to strengthen family connections by aligning children with specific members of kin and by extension specific social groups. Previous research has identified precise patterns in namesaking in South Central Nebraska (Obasi, 2016). For example, male newborns are more likely to be namesaked than female newborns; first-born children are more likely to be namesaked than later-born children; and, namesaked children are more likely to be named after paternal relatives rather than maternal relatives. This project builds on these observations by examining naming patterns in Perkins County, Southwestern Nebraska from 1997-2017 using birth announcements printed in the Grant Tribune.

Poster 11 – Taylor Kizer
Mentor: Mickey Langlais
Title: *Connect or Disconnect?: Examining the Influence of Social Media Behaviors on Interpersonal Health*

The use of social media has increased dramatically over the past decade (e.g., Greenwood, Perrin, & Duggan, 2016), with some research indicating a negative relationship between social media use and mental health (Forest & Wood, 2012; Kalpidou, Costin, & Morris, 2011). However, this research has primarily focused on Facebook as opposed to other or multiple social media platforms. Few studies have examined the varied or cumulative effects of social media for interpersonal health. Thus, the goal of this study is to examine the relationship between the four most popular social media platforms (Facebook, SnapChat, Instagram, and Twitter) and individuals reported levels of stress, depression, and anxiety. Data for this study comes from a community sample of 262 participants (Mean age = 26.73, SD = 10.35; 77.1% female). Participants completed an online survey that asked questions regarding average minutes on Facebook, SnapChat, Instagram, and Twitter, frequency of social media behaviors, which included posting photos and videos, making posts, commenting on others' social media content, monitoring others' social media, and private messaging on social media, as well as questions measuring mental health. Linear regression analyses revealed that number of private messages was positively associated with stress, number of photos, private messages, and minutes on Facebook were positively associated with depression, and minutes on Facebook, frequency of posting photos and videos, and number of minutes private messaging and monitoring others' content was positively associated with anxiety. An examination of separate social media platforms illustrated that posting content on Twitter and Instagram was positively associated with stress and depression. Results of the current study reveal that individuals may benefit by refraining from spending too much time on social media, particularly when it comes to posting and sharing content. Additional implications will be discussed.

Poster 12 – Victoria Peterson
Mentor: Sharon Obasi
Title: *Assessing Public Opinion on the Use of Cannabis-based Medicine with Alzheimer's Patients*

According to the Alzheimer's Association, more than five million Americans are living with Alzheimer's disease (www.alz.org). This disease often comes with behavioral symptoms such as agitation, irritability, anxiety, depression, and combativeness. Previous research, using an animal model, has identified certain neuroprotective effects of using cannabis-based medicine, especially for the reduction of compulsive or repetitive actions (Casarejos et al., 2013). Thus far, in human-based research, there has been a lack of clinical trials and case reports about the use of cannabis-based medicine for the treatment of behavioral symptoms of Alzheimer's disease. Indeed, the use of such types of medicine invites discussion. Thus, the purpose of this research project is to assess public opinion on the use of cannabis-based medicine to treat the behavioral symptoms of Alzheimer's disease. Public

opinion was assessed using a Qualtrics survey. Knowledge of, and opinions on, the efficacy of using cannabis-based medicine for the treatment of the behavioral symptoms of Alzheimer's disease will be discussed.

Poster 13 – Hannah Woodward
Mentor: Jeanne Stolzer
Title: *Psychiatric Medication Use of UNK campus*

According to published data, psychiatric drug prescriptions have risen dramatically across America over the last 20-25 years. The purpose of this study is to determine what type of psychiatric diagnoses are most prevalent and which types of psychiatric medications are prescribed to treat these illnesses in students at a relatively small-sized Midwestern university. Data collection included mental illness diagnoses, if there were multiple diagnoses, types of psychiatric medications prescribed, and the increase or decrease of these drugs, and the type of medical provider utilized. I also assessed variables such as age, gender, ethnicity, and insurance to ascertain if any statistically significant differences could be detected.
Findings of this study indicate, that nearly 50% of participants cited that their provider offered no alternatives to psychiatric drugs when it came to treating their mental illness diagnosis. I also analyzed if the provider increased the dosage of these medications and/or added other psychiatric medications to the treatment plan. Results indicate that over 25% of medical providers added more psychiatric medications to their treatment plans while only 17.19% decreased medication. Approximately 62% of participants indicated that after their initial prescription, no further psychiatric drugs were prescribed. My study also analyzed who referred these college students for psychiatric evaluation and if these students had insurance. Results indicated that 59.52% of participants were diagnosed with a psychiatric illness and then prescribed psychiatric drugs by a general practitioner. Findings also indicated that 96.74% of participants had health insurance. In addition, I assessed what type of diagnosis the student received and if multiple diagnoses were made. The diagnosis most reported was depression (56.14%). Of the responses, 35.09% of participants had at least two or more diagnoses. Furthermore, my online web-based survey determined what types of psychiatric drugs were prescribed. The most prescribed drugs were Zoloft and Lexapro (antidepressants).

Geography & Earth Sciences

Poster 14 – Connor Gosnell
Mentor: Paul Burger
Title: *Locating a Community Garden Using GIScience in Omaha's Food Dessert*

Suburban growth in America and the concurrent decline of inner cities has led to the expansion of large suburban super-market chains that follow population shifts and leads to a decline of neighborhood grocery stores (Altwitt and Donley 1997; Guy et al. 2004). What results are areas within the central city where a lack of variety of both healthy and affordable

food options exist for those residents who remain. Food deserts, as they are commonly referred, are voids in the economic landscape where little or no competition exists and access to existing stores proves difficult for those of lower socio-economic status who remain in inner-city neighborhoods (Fury et al. 2001; Cummins and Macintrye 2002; Guy et al. 2004).
Eastern Omaha, Nebraska is one such inner-city food desert designated as low income with low access to supermarkets (USDA 2017). Community gardens have been introduced in these neighborhoods to increase accessibility to affordable fresh fruits and vegetables (The Big Garden 2017). This study uses Geographic Information Science (GIScience), locational-allocation and existing garden locations in conjunction with 2017 block group socio-demographic data to locate a new community garden. The minimize impedance (P-Median) algorithm identifies a new garden site east of 72nd street that minimizes the total weighted distance for all demand (households within the block group below the poverty level) among the community gardens (existing and new site).
Keywords: Community Gardens, GIScience, Site Selection

Poster 15 – Emma Neil
Mentor: Jason Combs
Title: *History of the Death Penalty*

This particular study not only provides a brief history of the death penalty in the United States, but evaluates in more detail the death penalty in Nebraska. Although fascinating, the goal of the project is to not simply provide an account of Nebraska's death penalty. That information is provided, but this project goes beyond that to spatially examine recent vote patterns regarding the death penalty. The geographical breakdown demonstrates how Nebraskans vote compared to their elected Unicameral officials.

Poster 16 – Natasha Winfield
Mentor: Jason Combs
Title: *Spatial Examination of Nebraska's Pioneer and Heritage Farms*

Land tenure and ownership rates have long been issues under consideration in the United States (Diller 1941; Clawson 1964). More recently, the examination of century farms—a term to note agricultural land held in a single family for more than 100 years—has also become popular. Studies examining century farms in several other states—Ohio and Tennessee, for instance—have evaluated patterns of land tenure and ownership over time (Van West 1986; Verstraten 2007). To our knowledge no studies have spatially analyzed Nebraska's century farms. The Aksarben Foundation in Omaha maintains a database for Pioneer Farms (Century Farms) and Heritage Farms—those held by a single family for 150 years. We plan to determine what factors impact long-term land ownership rates in Nebraska. This study will incorporate historical geography principles and also employ GIScience to analyze and map findings.

Kinesiology & Sports Sciences

Poster 17 – Katelyn Unvert
Co-Author – Jourdan M. Ringenberg
Mentors: Matthew Bice, Megan Adkins, Danae Dinkel, Nate Bickford, Angela Hollman & Dick Meyer
Title: *Aquaponics as a Tool to Increase Middle- School Students Fruit and Vegetable Consumption*

Obesity is the number one nutritional-related health issue in the United States and nutrition education is commonly neglected (Hung et al., 2015; Zimmerman & Snow, 2012). Further, many schools do not have the ability to teach additional subjects, making health education a serious concern (CDC, 2017). Aquaponics growing systems are self-sufficient growing systems and can be used to indirectly influence health. Growing programs are not new and but no experiments exists using Aquaponics systems. Utilizing Aquaponics systems as a teaching model allows teachers to be efficient and instruct lifelong skills. Teaching adolescents' appropriate health behaviors through growing activities can alter health behaviors that will possibly transition into adulthood. It is hypothesized that students who grow food will have better eating habits. Our overall research question is: Does the inclusion of an Aquaponics system in a classroom increase fruit and vegetable consumption among middle school aged students?
During the summer of 2017, sixteen (n = 16) middle school science teachers across the state of Nebraska were trained on how to use and maintain small and large Aquaponics growing systems. Each teacher had their own system and given tools on how to use the system to teach science and health. Teachers and students completed online surveys that asked a variety of questions about Health Consciousness and Nutritional behaviors. Data were collected at different segments of the school year 2017-2018 (August, December, May).
Growing systems have generated a lot of interest, however impact data is missing from the literature. Data for this presentation will report changes in nutritional intake and food choices over the course with the integration of an Aquaponics growing system in their classroom. This presentation will also discuss specific strategies that science teachers found helpful during implementation while using the system as a teaching model.

Poster 18 – Paula Zakrzewski
Mentor: Matthew Bice
Title: *The Correlation Between Middle School Students' Motivation to Learn Science and Social and Emotional Health and Health Consciousness*

Health is an important piece of an individual's life, but increasing rates of childhood obesity suggest that students do not apply healthy habits to their own lifestyle choices. This may be caused by a lack of personal motivation, behavioral choices, and/or lack of knowledge. In many cases, health is taught during time at school; however, many schools are finding it hard to find time to specifically focus on health education. While some schools provide an overview of health-related topics during biology classes,

health education is often placed into physical education curriculum and taught in a gym setting before physical activity. This project involved incorporating Aquaponics growing systems in classrooms across the state of Nebraska as means to teach health through science lessons. Specifically, we explored the relationship between motivation to learn science, perceived social and emotional health, and health consciousness among middle school students. METHOD. Seventeen (n = 17) middle schools across the state participated in the Aquaponics intervention. Surveys were distributed to each participating school to be completed electronically by middle school students. The measured variables of interest included: (a) motivation to learn science, (b) perceived social and emotional health, and (c) health consciousness. Data were collected in August 2017 and November 2017. RESULTS. Significant correlations were revealed between the variables of motivation to learn science and health consciousness at both data collection points. Furthermore, significant associations were also revealed between social and emotional health and health consciousness. CONCLUSION. Aquaponics can potentially be a preventative measure to help combat the obesity epidemic. Findings from this study indicate trends that could lead to sustainable prevention through relatively uninvestigated constructs.

Political Science

Poster 19 – Braydon Conell
Mentor: Satoshi Machida
Title: *United States and China: Ratification of the ICESCR*

The problem being researched surrounds the ICESCR. The United States was originally a signatory, but recent administrations have not ratified it into a recognized treaty. Another country involved with the ICESCR is China. The PRC has been known as a restrictor of human rights, yet China has both signed and ratified the ICESCR. As Pew Research (2017) found that the United States' competitive advantage in favorability around the world has declined, leaving human rights treaties such as the ICESCR unratified could result in lasting implications for American foreign policy as the world will view the country as contradictory in its values. Not joining international human rights treaties is a blow to the soft power of the United States and the world could see the emergence of China as a global power and threaten the United States for the top spot. The main question that has been researched from this discourse is why the United States, a so called "beacon for human rights" has not ratified the ICESCR while China, a known violator of some human rights, has ratified this treaty. In analyzing this question, three aspects of each state were researched; these included comparing the countries' constitutions to the ICESCR, analyzing the economic and social welfare conditions in each state, and conducting a survey to gather American public opinion on the rights contained in the ICESCR.

Because the United States has not ratified this treaty, deciphering public opinion will help clarify if the United States is truly a “beacon for human rights” or if both the state and the people are unsupportive of these rights.

Poster 20 – Henry Gonzalez
Mentor: Charles Rowling
Title: *Drone Warfare*

In recent years since the terrorist attacks that occurred on September 11, 2001, and the following war on terrorism, drone warfare has increased significantly as a military tactic by the United States. This procedure has become controversial for many reasons. To begin with, it challenges two important universal international laws, jus ad bellum which dictates the conditions under which a State may resort to the use of force and jus in bello, which is the means and methods of force a State may legally use. This has brought many scholars and lawyers to question the legality of the use of drones within international law and whether these laws need to be updated.

Poster 21 – Nicole Kent
Mentor: Peter Longo
Title: *A comparison of healthcare in urban and rural Nebraska*

In the United States, rural populations face numerous disparities in obtaining quality healthcare when compared to urban populations. While about 20% of the population live in rural areas, only about 10% of physicians work in rural areas. In addition, hospitals serving rural residents are typically under-resourced in terms of clinical, financial, and technological capabilities. According to national statistics, residents of rural areas have poorer health behaviors, such as consuming less fruits and vegetables, exercising less, and using tobacco products more, when compared to residents of urban areas. Rural populations also have lower income, less education, and less social support than urban peoples. Rural people are more likely to be uninsured than their urban counterparts, and the cost of healthcare is higher in rural hospitals than in urban hospitals. Nebraska is unique relative to the country as a whole because only 12 of its 93 counties are classified as metropolitan. Because of this, it is difficult to apply national statistics on disparities between rural and urban healthcare to healthcare in Nebraska. Using the County Health Rankings and Roadmaps as well as the Hospital Consumer Assessment of Healthcare Providers and Systems survey (HCAHPS), this project will (1) determine whether urban healthcare quality exceeds rural healthcare quality in Nebraska, (2) identify areas in Nebraska that do not have adequate access to healthcare, and (3) characterize the baseline healthcare needs of a rural community.

Poster 22 – Rachel Kneifl
Mentor: Peter Longo
Title: *Social Science on Social Media: Using Social Media to Advance Political Knowledge in Our Polarized Society*

Social media and politics are both large parts of American society as of 2018. This paper will explore the relationship that social media use and political engagement have with each other. Social media usage has increased dramatically since 2006, when Facebook first became available to the public. Twelve years later,

America has become a nation of increasing political polarization and unrest, much of which is expressed through social media. Using the behavior of Americans on social media in comparison to the polarization that is taking place, it is evident that connections exist. Although social media often contains bias or false information and facilitates threads of hate-fueled conversations, it continues to remain widely used and relied upon. Prior research shows that many Americans are aware of this misuse that is taking place on social media. The continuation of uncivil political conversation on social media has already negatively impacted American democracy and the lives of citizens and will continue to do so if interventions are not made.

Poster 23 – Carson Messersmith
Mentor: Peter Longo
Title: *Family Farms on the Great Plains: Protecting Heritage*

Corporate farming is perceived as major threat to the family farm. As rural populations dwindle the political influence of the family farmer is diminishing as well. Corporate farming is perceived as a major threat to the family farm. Policies and laws aimed at protecting the family farm are limited due to the constitutional and resulting political constructs. This poster will explore the political factors impacting the family farm. Specifically, this poster will: 1) Review the anti-corporate farm legislation in a Nebraska, Kansas, and South Dakota 2) analyze the constitutional cases associated with corporate farming; and 3) provide a legislative framework in which family farm protective legislation can withstand constitutional scrutiny.

Poster 24 – Jackson Porter
Mentor: Joan Blauwkamp
Title: *The Interviewer Effect: External Factors in Research and Interviews*

There are factors both in individuals conducting surveys as well as the conditions that research/interviews are conducted in. In my research, I aim to perform a literature review to analyze different demographic factors as well as environmental factors and how they effect the results of a research experiment. In doing this, I aim to see which of these factors provide the strongest effects on the results of research as well as the most common types of external influences on research projects. After the conclusion of this research, I aim to conduct a survey testing some of these interview structure biases as well as question wording and demographic factors. This research will take place in order to test new combinations of these factors as well as confirm existing findings in the field.

Poster 25 – Jessa Schultis
Mentor: Peter Longo
Title: *White Evangelical Support for Donald Trump in the 2016 Election: An Analysis of Attitudes, Beliefs, and Values*

In the aftermath of the unexpected election of Donald Trump as president in 2016, academics and pundits tried to explain, and continue to explain who, or rather which subsections of the population, were responsible for his election. The purpose of this paper is to analyze the factors that can explain the

overwhelming support for Donald Trump by white evangelical Christians. Evidence suggests that white evangelical Christians joined other identifiable sections in delivering a victorious outcome for Trump. Given Trump's personal issues associated with marriage, sexual harassment, and abortion, support from white evangelicals needs further analysis. In this paper, 1) data from the 2016 election is analyzed and compared to the socioeconomic conditions of white evangelicals, and 2) evangelical cultural attitudes are analyzed and compared to campaign rhetoric by Trump to gain a better understanding of Trump's success with this population despite his personal flaws.

Psychology

Poster 26 – Jacob M Andreasen
Mentor: Evan Hill
Title: *Rat Perception*

Rats have long been said to be color-blind due to the poorness of their overall eyesight. Studies have shown that this claim is false, but that rats do have a more difficult time when it comes to distinguishing between colors of similar wavelengths. Due to the poor quality and inadequate evolutionary advancement of rat vision, it is a simplified system for investigation for variables such as developmental environment. The current project involves testing ordinary rat eyesight capabilities in a visual cliff apparatus, to determine a baseline range for future research involving the specimens being subjected to an environment in which there is only one specific wavelength of light presented from birth and into adulthood. The ultimate goal of this study is to answer whether their visual wavelength detection is completely contingent upon the rat environment whilst growing up, or if the rats are born with the capability to see all forms of wavelength regardless of pre-adulthood environment.
This study will involve taking a sample of 10 rats and subjecting each rat individually to a visual cliff apparatus under different wavelengths of light to study the normal behavior of the specimens when being introduced to this sort of new environment. Each rat will be studied for 5 minutes under three different light wavelengths (green- 500 nm, blue- 470 nm, and normal room light- 555 nm) to see if the rat ever crosses the visual cliff barrier, or if the rats showed any behaviors out of the ordinary with the different wavelengths applied. It is hypothesized that the rats will clearly avoid the ledge in fear of the visual of falling regardless of the wavelength of light the rats are presented with, but will display normal stressed-related behaviors due to a new environment that may startle the specimens.

Poster 27 – Samantha M Baumert
Co-Author – Caitlyn K Graf
Mentor: Krista Fritson
Title: *The Effects of Mindful Meditation via Mobile App on Graduate Students*

This study evaluates the effects of mindful meditation via mobile application on individuals' perceived stress, life satisfaction, hope, and self-efficacy. Limited research has been conducted looking at the effectiveness of mindful meditation done using mobile applications; however, Carissoli, Villani,

and Riva (2015), found moderate but significant effects of mobile application meditation on self-perceived stress. In our study, participants, graduate students in a counseling/school psychology program at a small university in Nebraska, were randomly assigned to either a Smiling Mind App group that completed meditation five times weekly or a control group that did not participate in mindful meditation. Both groups completed questionnaires related to self-perceived stress, life satisfaction, hope, and self-efficacy prior to the mindful meditation group commencing the meditation exercises, then after three weeks of meditation activities. Consistent with the previous study, we hypothesized that individuals who completed mindful meditation would show lower levels of perceived stress compared to the non-meditation group, as well as higher levels of life satisfaction, hope, and self-efficacy. Results have implications related to saliency of the meditation app, duration of the intervention, and participant attrition.

Poster 28 – Shelby Engles
Mentor: Julie Lanz
Title: *Influenza Prevention: Predicting Nebraskans' Intent to Get the Flu Shot*

Rural communities face unique healthcare challenges such as access to a primary health care provider. Furthermore, access to health care impacts infant mortality, disease complications, and vaccination rates. Healthcare inequalities in Nebraskan rural communities lead to further disparities in health outcomes, making this research crucial as the United States ranks behind other nations in health performance. In this study, Nebraskan adults were recruited to participate in a study about factors that influence their likelihood of obtaining the Influenza vaccine. Participants were recruited with cooperation of Two Rivers Public Health Department (TRPHD). TRPHD distributed recruitment flyers via paper and electronic methods like Facebook. After participants provided informed consent, they responded to a 15-minute survey with measures of: trait neuroticism, general self-efficacy, protection motivation theory-based questions, and demographics. It is predicted that perceived vulnerability, perceived severity, neuroticism, general self-efficacy, and perceived response efficacy will predict the participants' intent to vaccinate against the Influenza virus. We also hypothesized that the distance travelled one way to reach a primary health care provider would be negatively correlated with intent to vaccinate against the Influenza virus. Demographic factors like gender, previous flu diagnosis, having a primary health care provider, household income, and news sources are also predicted to be related to Influenza vaccination intention.

Poster 29 – Lacey Johnson
Mentor: William Wozniak
Title: *Effects of Types of Distractor on Performance in a Driving Course*

While driving past a parked police car with its lights flashing, there may be a tendency for cars to drift towards the lights. This phenomenon has been coined the "moth effect," just as moths drift towards lights. Our aim was to determine if the moth effect is present when participants drive a vehicle on a path lined with external distractions, such as road signs and barriers, and whether local

distractions and impairments, such as texting, have an effect on the supposed moth effect. It was hypothesized that local distractions would enhance the moth effect seen while driving. Our design was completely within subjects and included 14 participants. They were instructed to try to steer straight while either texting, talking on a cell phone, wearing intoxication goggles, or driving with no local distraction. A video camera recorded the position of the vehicle, and later analysis was done on the videos to determine the amount of drift from side to side. A three-way within-subjects analysis of variance was conducted on the measurement of deviation from the center line. There was a significant main effect of external distractor ($F(8, 104) = 7.68$, $MSerror = 43.18$, $p < .01$) and a significant main effect of distance from the external distractor ($F(6, 78) = 2.57$, $MSerror = 1.07$, $p < .01$). There was a significant interaction of external distractor and distance ($F(48, 624) = 1.95$, $MSerror = 170.68$, $p < .01$). There were no other significant effects found. The scores indicated that participants, in all cases, drifted toward the left-away from the distractions. However, it seems that the moth effect was a reduction of that tendency to drift left, but still remain to the left of the center line.

Poster 30 – Sarah Strawn
Mentor: Evan Hill
Title: *Selective Attention Effects on Human Auditory Brainstem Response Recordings*

Auditory Brainstem Responses (ABRs) are electrophysiological readings, typically recorded from the scalp. Electrodes pick up electrical activity in the auditory system, which is generated by synchronous neural firing in response to a sound. The purpose of this experiment is to determine if selective attention has any effect on ABR recordings. Selective attention occurs when multiple stimuli are presented simultaneously, so the subject must choose one stimuli to focus upon and disregard the others. The current study will implement two conditions. In one, an ABR is recorded while the participant sits with their eyes closed. In the other, the participant will complete a word search, mentally keeping track of the words they find, while an ABR is recorded. Focusing on the word search causes selective attention. While the ABR records from the auditory system, it does not record neural signals in the thalamus or the auditory cortex. The thalamus acts as a relay station that sends only the information being attended to the cortex. The auditory cortex is where information would then be translated into what we perceive as sound. Since signals from the thalamus and the auditory cortex are not recorded, the ABR should be unaffected by selective attention when the second stimulus is not sound. For these reasons, it is predicted that no significant difference will be seen between the two conditions. If this is true, then selective attention is not a variable that those recording an ABR need to be careful of. As most patients requiring ABR are nonverbal, often young children or mentally disabled, these patients benefit from remaining in a familiar location such as at home. If this finding is proven to be true, an ABR could be performed in this familiar, calming environment.

Poster 31 – Christian Vera
Mentor: Krista Forrest
Title: *Mock juror's perceptions of interrogator testimony*

Juries are full of people that have no specific expert knowledge. However, they are often put in situations where they have to sift through and evaluate expert testimony. While many people thought that jurors evaluate the material objectively, Ivkovic and Hans (2003) found that jurors consider the message and the messenger when evaluating the expert witness' credibility. The goal of the current study is to examine factors which influence jurors' perceptions of interrogator testimony. We expect that the police officer's credentials and believability would be important in similar ways as other expert witnesses therefore we want to examine the effect of police training type on participants perceptions of interrogator behavior. Specifically we expect participants to rate police interrogation techniques as more appropriate if learned technique is from formal police training vs on-the-job training. We also expect that participants will rate the technique as less appropriate if presented with expert testimony against using that technique. Results and implications will be discussed.

Social Work

Poster 32 – Miranda Ketteler
Mentor: Christina Sogar
Title: *Faculty and Student Views of Accommodation Policies*

Research indicates that disability accommodations are positively associated with student test scores, retention and graduation rates (Cole & Cawthorn, 2015; Fuchs, Fuchs & Capizzi, 2005). However, barriers exist to the successful implementation of accommodation policies. First, students and faculty need to be aware that accommodations are available and know where and how to access services. Secondly, students must self-identify as having a disability and be able to provide the required documentation. Finally, students must be willing to seek services. Broader social values stigmatizing disability have been shown to decrease students' willingness to establish accommodations (Condra et al, 2015). Our results found that students are less willing to ask for accommodations for mental illness or learning disability than for physical disabilities. In addition, both faculty members and students were more likely to report that students with physical disabilities are as capable as other non-disabled students compared to students with mental illness or learning disabilities. This suggests that barriers to establishing services and student and faculty views of academic potential vary based on disability type.

Natural & Physical Sciences

Biology

Poster 33 – Larissa Attema
Co-Authors – Alexis Page
Mentors: Kimberly Carlson, Brandon Luedtke & Brad Ericson
Title: *Drosophila melanogaster Nora virus ORF1 Protein is Localized to the Nucleus*

Nora virus is a picorna-like virus that is transmitted via the fecal-oral route. The genome of the virus contains four open reading frames (ORFs) known as ORF1, ORF2, ORF3, and ORF4. ORF1 was the focus in this study, and it is believed to encode an RNAi inhibitor. When we performed a sequence analysis of ORF1, we discovered a putative bipartite nuclear localization signal (NLS), which is a sequence of amino acids that directs the transport of proteins into the nuclei of cells. The goal of this project was to verify that this NLS was transporting ORF1 into the nucleus of the cell. We created an ORF1-GFP construct, as well as a mutant construct that deleted the NLS from ORF, transfected these into S2 cells, and observed using florescent microscopy. The results suggest nuclear localization, as the ORF1-GFP staining overlaps with DAPI staining in nuclei of the S2 cells, and the mutant construct showed GFP staining in the cytoplasm with no overlap with DAPI in the nuclei. To our knowledge, this is the first example of an RNA virus that specifies an RNAi inhibitor that translocates to the nucleus.

Poster 34 – Kathleen B Bartunek
Co-Authors – Renee Roebke, Joseph Haag, Katelin Arndt, Morgan Schenck
Mentor: Paul Twigg
Title: *Effect of Biochar Soil Amendments on the Health of Corn Plants*

This research explored the impact of incorporating biochar into native Nebraska soils and it's interactions with corn. Biochar is a low cost effective mechanism for enhancing soil profiles and has been proven to improve plant health in several other species including cotton and tobacco in the Southeast USA. Biochar has been known to increase plant yields, improve overall plant health, and recruit important microorganisms through mechanisms within the rhizosphere in these other species. In this project, biochar was applied at different rates in 5x5 m2 plots of native loam soil near Kearney, NE. Corn was planted in the late spring of 2017 in these plots. Over the next several weeks, chlorophyll measurements were made and leaf discs were collected with a hole punch. From the leaf discs, protein extractions were performed to measure peroxidase activity as an indicator of oxidative stress levels. We will present the overall chlorophyll measurement data and the peroxidase activity over the course of our study. We will also discuss the relationship of both measurements to the overall health and yield of the plants and the relationship to the added biochar. This research was supported by the Undergraduate Research Fellows program, the UNK

Biology Department, and NSF EPSCoR grant number OIA-155741.

Poster 35 – Audrey L. Codina
Mentor: Dawn Simon
Title: *Degeneration of a nuclear rRNA group I intron in the lichen Teloschistes chrysophthalmus*

The origin of spliceosomal introns is difficult to discern due to high sequence divergence and the absence of direct evidence linking an intron to its source. While spliceosomal introns are found primarily in protein-coding genes of eukaryotes, putative examples in nuclear ribosomal RNA (nrRNA) coding genes of lichen-forming and allied fungi also exist. Due to their unique genomic location and limited phylogenetic distribution (Pezizomycotina), the nrRNA spliceosomal introns are a potential example of a new type of recently derived intron. We specifically hypothesize that nrRNA spliceosomal introns arise from degeneration of group I introns. In order to identify examples of transitional forms, introns were extracted from rRNA alignments of Pezizomycotina (Ascomycota). These introns (2260 introns at 129 sites) were preliminarily classified based on size and sequence characteristics. We find a bimodal distribution, which we hypothesize represents a mixture of intron types, with the majority of large insertions being canonical group I introns and small insertions likely to be spliceosomal introns. Insertions of intermediate size may represent transitional stages of group I intron degeneration. Here we focus on one exemplar lineage of intermediate-sized introns found at a single position in the nuclear ribosomal small subunit (SSU) of Teloschistes chrysophthalmus. To this end, we have sequenced introns from samples across the North American geographic range of the species. Introns at this position are of varying lengths (187-407 nt), all contain characteristic sequences of spliceosomal introns and many have potential secondary structures typical of group I introns. We further characterized splicing in this intron lineage using in vivo reverse transcriptase PCR. A subset of the introns appears to either not splice or splice at low efficiency. This finding is consistent with a predicted correlation between degeneration and loss of splicing ability. Taken together, the evidence supports group I intron degeneration at this site.

Poster 36 – Breana Dobesh
Co-Author – Jourdan Ringenberg
Mentor: Dustin Ranglack
Title: *Testing Common Bait Type Effectiveness for Trapping Eastern Cottontail Rabbits in South-Central Nebraska*

The objective of this study was to determine whether or not there is a difference between the effectiveness of dried corn and fresh apples as bait for Eastern cottontail rabbits (Sylvilagus floridanus) of South-Central Nebraska. Sixteen large catch-and-release animal traps were utilized in this study, with the traps being placed in woodland habitat within 6 different agricultural properties of Axtell, Nebraska from mid-February to mid-March. The traps were baited with either fresh apples or dried corn kernels, with each trap being checked for captured animals once a day, 5 days a week, for 6 weeks. After recording which type of bait was used to trap the rabbits and releasing

any captured rabbits, these frequencies were analyzed using a chi-square goodness of fit test, using mutually exclusive categorical data, with an alpha value of 0.05. We predict that there will be a significant difference in the effectiveness of dried corn and fresh apples as Eastern cottontail rabbit bait, with the dried corn proving to be more effective as a bait type, as it is the most readily available "natural" food source and thus more familiar to the rabbits. The data and information produced in this experiment will be vital to potential hunters and to wildlife biologists studying these lagomorphs, as they may be able to more effectively trap the rabbits in larger numbers.

Poster 37 – Megan Hunke
Co-Author – Wuilian Martinez
Mentors: Surabhi Chandra & Mahesh Pattabiraman
Title: *Antineoplastic properties of Cinnamic Acid Dimers and Cinnamic Acid Dimer Derivatives in Breast Cancer Cells*

Cancer is the second major cause of death in developed countries, and despite extensive research, there is still a need for medications with low toxicity to normal cells. Cinnamic acids (including ferulic acid, p-coumaric acid, and caffeic acid) are naturally present in fruits and vegetables, and have been studied to assess their antioxidant, anti-inflammatory, and cytotoxic properties. Our aim in this study was to determine if certain cinnamic acid dimer and their derivatives (CADs/ CAD-Ds) exhibit potent cytotoxic properties against cancer cells, specifically breast cancer cell lines MCF-7 and MDA-MB-231, with less effect on normal breast epithelial cells (MCF-10A). CADs/CAD-Ds were synthesized using cavitand mediated photodimerization (CMP) method, which involves photo-irradiation of CADs in a macrocyclic host, γ-cyclodextrin. Cells were plated in 96-well and 384-well plates and treated with test compounds for 24-72 hr. Cell survival was determined using PrestoBlue dye, measuring the fluorescence at 560/590nm (ex/em) and further IC50 of each compound was calculated. We also utilized flow cytometry to determine which phase of cell cycle each treatment was inhibiting. We found that certain CADs/CAD-Ds, such as ferulic acid dimer, 3-methoxy CA dimer, 3-fluoro-CA dimer, 4-fluoro-CA dimer, and 3,4-di-fluoro-CA dimer, were more potent than their monomeric counterparts in inhibiting the growth of breast cancer cell lines while not affecting normal breast epithelial cells at those concentrations. This study provides an avenue for research on a novel class of antineoplastic compounds derivatized from natural sources.

Poster 38 – Emily Laub
Mentor: Letitia Reichart
Title: *Genetic Structure of Northern Goshawks (Accipiter gentilis) Populations in Montana and Finland*

Understanding the genetic structure of a species is important for finding information on interactions between and within populations. It may also shed light on the evolutionary and geographic history of specific populations. The purpose of this experiment is to extract DNA from molted feathers belonging to two populations of northern goshawks (Accipiter gentilis) and using it to

determine genetic diversity. The feathers, which were collected from Montana and Finland, are a reliable source of DNA. Using PCR (polymerase chain reaction) the microsatellite loci within the DNA will be amplified and compared between individuals within the same population and between the two populations. Microsatellite loci are non-coding genes that vary between individuals and populations, making it possible to determine the amount of shared genetic material and to better understand the genetic diversity of the northern goshawks. It is expected that the Finland and Montana populations will be genetically distinct, but information may be found about population dispersal, migration, and evolutionary history.

Poster 39 – Isaac Lee
Co-Author: Amanda Macke
Mentor: Kimberly Carlson
Title: *Detection of the Nora virus Regulated Proteins, Vir-1 and Vago, in Drosophila melanogaster Hemolymph.*

Research into the innate immune response of Drosophila melanogaster against viruses may help identify their functions in humans. Two viral regulated proteins, Virus induced RNA-1 (Vir-1) and Vago, are candidates for analysis because they are biosynthetic products of the innate immune system. As of yet, the function of these proteins is uncharacterized in Nora virus infection. The pathology of Nora virus is unknown, but a cognitive locomotor defect has been identified in our lab. Our hypothesis is that if Nora virus infection is causing the locomotor defect, then the most likely route of transmission from the gut to the brain would be through the hemolymph. Western blot analysis of Nora virus infected flies demonstrates the presence of Nora virus, Vir-1, and Vago within the hemolymph. Since Nora virus was previously thought to only be located within the gut of D. melanogaster, this is a new finding that may indicate infection in other tissues. More research must be conduction on Vir-1 and Vago, but it is now possibly identified as part of the proteome comprising the hemolymph of Nora virus positive flies.

Poster 40 – Morgan Lee
Mentor: Austin Nuxoll
Title: *Using Caenorhabditis Elegans as a Model Organism for Persistent Staphylococcus Aureus Infections*

Staphylococcus aureus causes a multitude of diseases in humans such as skin infections, toxic shock syndrome, endocarditis, and bacteremia. A hallmark of these infections is their association with biofilms - a community of bacteria adhered to a surface. Biofilms often form on abiotic surfaces like a prosthetic implant, catheter, or shunt. These infections are often associated with relapsing infections and poor prognosis. The underlying mechanism for this is thought to be caused by persister cells. Persister cells are a subpopulation that have become more dormant like and are tolerant to antibiotic therapy. Recent work as identified lowered energy states in this subpopulation as the reason for antibiotic tolerance, specifically reduced TCA cycle activity. To date, these studies have been performed in vitro. It is currently unknown whether this same phenotype will occur within a host and how the host's natural immune response will respond to the persister population. Based on these

observations, we hypothesized that decreased TCA cycle activity would lead to increased survival in the nematode, Caenorhabditis elegans. C. elegans were infected with wild type S. aureus and a TCA cycle knockout, fumC. Seven days post infection surviving bacteria were enumerated and surprisingly the fumC mutant exhibited reduced survival compared to wild type. We then predicted that this observation was due to the acidic environment of C. elegans intestinal lumen. As expected, when the fumC mutant was grown in acidic media there was decreased survival compared to wild type S. aureus. From these results we have concluded C. elegans is not a suitable model for testing persister survival in a host.

Poster 41 – Amanda McCown
Mentor: Kimberly Carlson
Title: *Relationship Between Locomotor Function and Nora Virus Infection in Drosophila melanogaster*

Nora virus is a member of the picornavirus family that infects Drosophila melanogaster with no published pathogenic effects. A previously unstudied pathogenic effect of Nora virus is locomotor ability. In this study, the effect Nora virus has on longevity and locomotor ability is being examined. Locomotion is examined using geotaxis, where flies have one minute to cross a threshold one inch from the top of the cage. Treatment groups include Nora virus infected, uninfected and Drosophila C Virus (DCV) infected flies. Longevity curves created using a Student's t-test demonstrate that Nora virus infected flies are significantly slower in their climbing abilities compared to uninfected flies, which supports a relationship between geotaxis and locomotor dysfunction in infected flies. No significant difference was seen in locomotor ability between DCV infected and Nora virus infected flies. Nora virus viral load was determined utilizing qRT-PCR with results that demonstrate a bimodal curve for Nora virus infection. This data suggests that Nora virus does effect locomotor function and can be classified as a pathogenic effect of the virus.

Poster 42 – Jasye Morrison
Mentor: Marc Albrecht
Title: *Growth Potential of Martian Simulant Soil*

In recent years, the focus of space exploration has shifted to human life on Mars. To accomplish this in reality, years of research will be required to innovate technology necessary to supporting human existence. Our research investigated a method of food production using the native soil. Since initial experimentation revealed that mixed Martian simulant was a poor substrate for growth, we planted two cereal rye seeds in nine ounce cups containing simulant that had been sifted to four size fractions (>0.25mm particles, 0.25mm-0.50mm particles, 0.50mm-0.71mm particles, and <0.71mm particles), simulant that hadn't been sifted (unsorted), or potting soil. Two seeds were planted in each cup to maximize germination. Preliminary results appear to show that all size-sorted simulant cups had better growth over the unsorted. Germination rates were higher as well. Our results may contribute to future research regarding food production once established on Mars.

Poster 43 – Justine Pitzer
Co-Author – Sydney Keckler
Mentor: Austin Nuxoll
Title: *Characterization of Staphylococcus lugdunensis biofilms*

Staphylococcus lugdunensis is a bacteria which, not unlike Staphylococcus aureus and Staphylococcus epidermidis, can be found on human skin as normal flora. While S. aureus has been the primary focus of the medical community, there are new concerns that S. lugdunensis has been responsible for biofilm-induced infections, similar to those caused by S. aureus and S. epidermidis. With more accurate testing available, medical professionals are now able to distinguish S. lugdunensis from other coagulase negative bacteria. This has led to a greater appreciation for this organism as a major human pathogen. Contributing to the pathogenic nature of this organism is its ability to form a biofilm, which is the culprit of severe prosthetic joint infections, as well as cases of endocarditis. We set out to identify genetic factors essential for biofilm formation in S. lugdunensis. We mutagenized a S. lugdunensis culture by treating with ethyl methanesulfonate (EMS). Following mutagenesis individual cells were separated using a cell sorter and examined for biofilm formation at eight hours and 24 hours. Mutants of interest will be confirmed and whole genome sequencing will identify candidate biofilm genes.

Poster 44 – Alaini Priebe
Co-Author – Olivia Hyde
Mentor: Surabhi Chandra
Title: *Cinnamic Acid Derivatives as Novel Antinociceptives for Acute Pain*

Search for alternate pain medications has gained more importance in the past few years due to nervous system related side-effects with opioids, gastrointestinal dysfunction associated with non-steroidal anti-inflammatory drugs (NSAIDs), and cardiovascular anomalies with cyclo-oxygenase-2 inhibitors (COX-2). Phytomedicine has been quite effective for treatment of pain, as these have been used for generations in regional communities, and tend to lack any major side-effects. A dimer of cinnamic acid, Incarvillateine (INCA), derived from the Chinese herb Incarvillea sinensis, has its primary antinociceptive action through the adenosine receptor. Adenosine-mediated analgesia has become an attractive target as it has the least side-effects. We hypothesized that derivatives of cinnamic acid dimers, which structurally mimic INCA show potent antinociceptive action, and their effect is mediated through adenosine receptor action. Compounds were synthesized using novel cavitand-mediated photodimerization method, which utilizes a macromolecule (gamma-cyclodextrin) to control the excited state reactivity of photoactive compounds to yield target tetra-substituted cyclobutanes (dimers). The dimers generated so far show significant suppression of formalin-induced acute pain in mice hind paw. Antinociceptive effect of ferulic acid dimer and 3-methoxy cinnamic acid dimer was observed primarily in the inflammatory phase, and the dimer binds to the adenosine 3 receptors (as revealed by

computer modeling). The pain suppressing response of these dimers was similar to that observed with indomethacin, an anti-inflammatory drug. Even though morphine was more effective than the synthesized dimers in reducing neurogenic and inflammatory pain, there was no visible neurogenic side-effects observed with administration of the dimers as commonly observed with morphine, which suggests a primary non-opioid action. Our further characterization and selection of INCA analogs, with predominant adenosine receptor action, will help us to generate a new class of antinociceptives with precise chemical modifications using CMP methodology.

Poster 45 – Andrew M. Riesenberg
Mentor: Keith Geluso & Mary J. Harner
Title: *Wildlife Use of Stock Tanks in the Nebraska Sandhills*

Artificial water sources provide access to water where it is generally limited in arid habitats and are used by livestock and wildlife. Despite their long history of use, few empirical studies have examined benefits or detriments of artificial water sources to wildlife. Our study identified vertebrate species at a stock tank in the Sandhill Region of Nebraska, compared use of the metal tank to an adjacent overflow pond and a control site without water, as well as determined behaviors exhibited at these sites. We programmed camera traps to take motion-detected and time-lapse photographs at a stock tank on a ranch in Loup County, Nebraska, USA, September-November 2017. Three cameras were used for analysis at the site: one overlooked a stock tank, one overlooked an overflow pond, and one was deployed 250 m away as a control. We observed at least 26 different species, including 18 resident and migrant species of birds, 7 mammalian species, and one amphibian species. We observed 6 behaviors, with drinking, feeding, and bathing dominating observation events. Drinking occurred at both water sites, but birds only bathed in shallow water of the overflow pond. Some birds were observed feeding in mud surrounding the overflow pond, whereas great blue herons (Ardea Herodias) preyed on northern leopard frogs (Lithobates pipiens) in the stock tank. Both water sources attracted many more individuals and species compared to the control. Our study provides empirical observations and analysis of wildlife use at a stock tank, which can be used to improve wildlife habitat at water sources. Creation of shallow overflow ponds will increase the diversity and functional use of water resources in arid environments.

Poster 46 – Tyler Schnitzler
Mentor: Dustin Ranglack
Title: *The effect of corn harvest on Whitetail Deer (Odocoileus virginianus) movements in South Central Nebraska*

The annual corn harvest in Nebraska drastically changes the landscape. During the growing season, corn provides excellent cover and foraging opportunities. After it is harvested though, corn fields provide no cover and more limited foraging. The purpose of this study is to document the movement of whitetail Deer before corn harvest (June-Late October) and after corn harvest (November-Late December). Twelve trail cameras were placed on public and private land south of the Platte River, near Kearney Nebraska. The cameras

were placed mid-summer in areas that whitetail deer would frequent. The cameras were checked periodically, and the number of deer and their sex was logged. We expect results the deer will migrate following corn harvest from the southern parts of our study area to the Platte River where cover is still available. This small migration from summer to winter home ranges will occur because of the corn harvest in late October, and deer season in mid-November which will push deer to the only available cover left along the Platte. The study's aim is to help wildlife managers create more continuous tracts of habitat south of the Platte River so that a portion of the local deer herd can find sanctuary. The large influx of deer to the Platte during the late season potentially puts stress on the Platte River ecosystem and may cause a localized increase is disease transmission, overgrazing, and other density dependent processes.

Chemistry

Poster 47 – Melissa Davison
Mentor: Kristy Kounovsky-Shafer
Title: *Developing Microfluidic Devices with a Stereolithographic 3D Printer*

Microfluidics are utilized in a variety of applications: optical mapping, sequence platforms, cell assays, etc. However, fabrication of microfluidic devices for these applications are expensive, time consuming, and often requires expensive instrumentation and clean-room facilities. Therefore, a different fabrication method is desired that utilizes relatively inexpensive instrumentation and materials, while having a reduced production time. Researchers are finding ways to do this with 3D printers. We develop a method for a specific type of printer. The chosen instrument to do this was a Kudo 3D Titan 1, a stereolithographic (SLA) printer. Different printer parameters for the printer were varied and tested with a variety of photolithographic resins to determine the smallest feature size the Kudo 3D printer could print with optimal detail. Also, a method was refined for curing and treating the finished print for PDMS compatibility when making the final device (cast). We established specific printer parameters for the highest quality prints of various feature sizes and gathered data to construct a table of approximate trends and correlations for printer settings and resulting prints, that can be used to guide the development of novel features and feature sizes. The significance of this project is that it allows microfluidic devices to be more accessible to many more laboratories than was previously, due to a reduced cost of production.

Poster 48 – Colton Hall
Mentor: Allen Thomas
Title: *LAT1 Membrane Transporter Selectivity for L and D Amino Acids*

The L-type amino acid transporter 1 (LAT1, SLC7A5), transports specific amino acids across the blood-brain barrier (BBB) and other tissues including thymus, testis, placenta, spleen, and skeletal muscle. It is also upregulated in cancer cells to support their increased metabolism. The origin of the name "L-type" was due to its preference for transporting leucine instead of alanine. However, in recent years, the "L" in LAT1 has been accepted as meaning "large" in

reference to its amino acid substrates: Phe, Leu, His, Trp, Tyr, Met and Val. Coincidentally, the "L" could also be interpreted as meaning selectivity for L isomers, since it is known that LAT1 is stereoselective for some, but not all, of its substrates. For example, the D isomers of most amino acids, with the exception of Leu, Phe and Met, were previously reported to have poor affinity. As we have been researching LAT1 for the purposes of using it in targeted drug delivery, we were curious as to whether this discrepancy in selectivity may be explained by different binding modes depending on the amino acid. Based on our computational models of the binding site, we hypothesized that the size and polarity of the side chains may be preventing some of the D amino acids from being transported. We have tested both D and L isomers of endogenous LAT1 substrates using cis-inhibition and trans-stimulation assays in HEK cells containing inducible levels of LAT1 expression. Surprisingly, based on our assays, we have found that with the exception of Val, LAT1 does transport both L and D isomers. Besides uncovering a potential unknown function for LAT1, the ability to use D amino acids to form LAT1-targeted prodrugs may allow for improvement in pharmacokinetics relative to L isomers.

Poster 49 – Isaac Hueftle
Co-Author – Tara Buettner
Mentor: Hector Palencia
Title: *New Method for Synthesis of 1,2-Dicarbonyl Compounds, Catalyzed by N-Heterocyclic Carbenes*

An N-Heterocyclic Carbenes (NHC) is a carbene in a five-member ring, with nitrogen atoms bonded to either side of it. Carbenes are carbon atoms with only six electrons in their outer shell, making them very reactive. Often, we bind bulky substituents to both nitrogen atoms to make it difficult for the carbene to react with itself or other compounds. The catalytic activity of NHCs depends on their structure, we had synthesized NHC imidazolylidene derivatives and found good catalytic activity for transesterification reactions in past research. In search of more active catalysts we work in the synthesis of new NHC triazolylidene precursors to find new methods to synthesize medical precursors, such as 1,2-dicarbonyl compounds, the purpose of this research, through a new reaction we discovered. Often, the main purpose of a new method is to develop short pathways to make molecules of biological interest, such as antibiotics, antiviral, anti-inflammatory, antitumoral, anti-HIV properties; 1,2-dicarbonyl compounds are key to synthesize them.

Poster 50 – Akshay Kashyap
Co-Authors – Treyvon Bokoskie & Wuilian Martinez
Mentor: Mahesh Pattabiraman
Title: *Expanding the cavitand- mediation approach for producing stereo- and regiospecific substituted cyclobutanes from cinnamic acids*

[2+2] Photocycloaddn. (PCA) of alkenes is an important photochemical reaction, which is often used in chemical optical data storage systems and in photopolymerization. Stereospecific cyclobutanes are important intermediates in organic synthesis, and are frequently encountered in natural products.

Developing a reliable method for producing stereospecific cyclobutanes will be of high value in this regard. However, the unimol. isomerization reaction of alkenes often precludes the bimolecular. PCA; and even when PCA ensues, selectivity in the reaction is often low as four possible stereoisomers could result. Our group has been successful in directing the PCA of substituted alkenes through the cavitand- mediation approach. In this method, macrocyclic cavitands (γ- cyclodextrin and cucurbit[8] uril) are used to non- covalently bind two reacting olefins within the cavity to form ternary inclusion complexes (1:2) ; photoexcitation of the complex would yield the dimer in high yields. This method is also effective in enforcing stereoselectivity, as the stereochem. of the product is structurally similar to the oriented arrangement of the reacting alkenes. Previously we had demonstrated that the syn H- H dimers of cinnamic acids could be reliably produced using this approach. By exerting steric hindrance in one end of the mol., we now show that selectivity in the reactions could be directed towards another dimer - the anti H- T isomer. Our work in this area indicates that the cavitand- mediation approach is developing into a reliable method for producing stereospecific cyclobutanes. We will present our recent findings in this line of research from our group.

Poster 51 – Molly Kohlbek
Co-Authors – Bryant Menke, Laura Stoner & April Maschmann
Mentor: Kristy Kounovsky-Shafer
Title: *Utilizing a pulsed waveform to elute DNA molecules in 3D printed devices for genome analysis*

An immense population of large DNA molecules will be required to cover structural variations found within the human genome. However, the fragility of DNA molecules requires the protection of agarose during cell lysis and cleanup to maintain their original length. In order to use the DNA molecules for Nanocoding, or other physical mapping platforms, they need to be in free solution. Therefore, we leveraged 3D printing to fabricate meso-fluidic devices to elute DNA molecules from a gel matrix using an electric field. Fluorescently stained λ DNA was mixed with molten agarose to form an insert. Once the insert is solidified, it is placed into a 3-D printed device and a pulsed voltage was applied to the device, using different ratios of time, to elute the DNA molecules from the insert into the solution. Images were taken periodically by illuminating the YOYO-1 stained DNA with blue LED light and analyzed. These images were analyzed to quantify the amount of DNA eluted for each pulsed waveform. Through these measurements, the most effective waveform and ratio of time was determined in order to elute large DNA molecules from an agarose insert; using these parameters, pulsing for only two hours led to approximately 60% of the DNA leaving the insert.

Poster 52 – Wuilian Martinez
Mentor: Mahesh Pattabiraman
Title: *Use of 2+2 alkene photocycloaddition to synthesize pain relieving analogs of Incarvillea Sinensis*

The use of pain relief medication is essential for the purpose pain management in traumatic injury, and medical procedures. Unfortunately, the most effective and powerful of these drugs fall under the class of opioids, such as morphine, which is addictive and subject to misuse. Moreover, opioids use can result in intolerance, which leads to needing for higher dosing as time progresses, and potentially fatal overdose by users. Hence there is a need for effective pain relief medication that does not use the opioid system to facilitate pain relief. Research is being done on the eastern Asia native plant Incarvillea Sinensis, which contains the active chemical component incarvillateine. This molecule is currently understood to provide pain relief through a nonopioid mechanism. Features of incarvillateine and possible main functionality of the molecule include the cyclobutane center, phenol groups, and carboxylic ester substituents. However, synthesis of incarvillateine as a whole is difficult and tedious. We are currently exploring synthetic methods to produce incarvillateine (INCA) analogs that could potentially be antinociceptive. The procedure we use to create INCA analogs takes advantage of a simple, but inefficient, photochemical reaction known as 2+2 alkene photocycloaddition. The efficiency of the reaction is improved by using a macromolecule (γ-cyclodextrin) to bring two of the reacting alkenes together, which increases the yield of the reaction significantly. Ten INCA analogs were synthesized, characterized, and tested on mice. The formalin-induced neurodegenerative pain model in mice indicate that at least two of the synthetic analogs were effective in reducing pain response during both initial inflammatory and late phases. Our selective and general receptor inhibitor studies suggest a non-opioid action mechanism. Because of the effectiveness of these analogs, further research will be done to identify more such synthetic analogs, their potency, and deduce mechanism of action.

Poster 53 – April Maschmann
Co-Author – Jocelyn Dolphin
Mentor: Kristy Kounovsky-Shafer
Title: *Concentrate electrophoretically eluted DNA molecules in 3D printed devices*

An immense population of large DNA molecules will be required to cover structural variations found within the human genome for personalized medicine. Therefore, we leveraged 3D printing to fabricate meso-fluidic devices to concentrate lambda DNA molecules eluted from a gel matrix using an electric field. For these devices, the dimensions of the concentration area were varied, as well as the shape; whereas, the height of the device remained constant. The device shape that concentrated the most DNA was then modified to determine the optimal dimensions.

Poster 54 – Cody Masters
Co-Authors – Jocelyn Dolphin & April Maschmann
Mentor: Kristy Kounovsky-Shafer
Title: *Developing 3D printed devices to concentrate DNA for genome analysis*

To understand structural variation for personal genomics, an extensive ensemble of large DNA molecules will be required to develop a database of genomic variations. Nanocoding, which is a whole-genome analysis platform, can analyze large DNA molecules for construction of physical maps that are assembled for a genome. However, it is very difficult to handle large DNA molecules, so we imbedded cells in an agarose matrix to protect DNA during cell lysis and cleanup. In order to get DNA molecules out of the agarose, we needed to electrokinetically elute DNA into solution and then concentrate that DNA. As a result, we utilized 3D printing technology to fabricate meso-fluidic devices to concentrate lambda DNA molecules eluted from a gel matrix under an electric field. To concentrate DNA molecules, a gel matrix was cured within the device to create a roadblock for the DNA molecules migrating through the channel. The matrix allows the buffer solution to move through, but prevents DNA molecules from traversing the matrix thus creating a roadblock. Conditions for creating the roadblock were tested to find the optimal conditions to create a matrix that possessed small pores and was curable within our polylactic acid (PLA) devices. In addition, DNA was concentrated at our roadblock and then recovered. Analysis with ImageJ showed that there was a 62.6% decrease in the mean fluorescence after the DNA was removed from the device. Furthermore, the DNA was analyzed to determine if the molecules were full length after the completion of the experiment.

Poster 55 – Hannah Schmitz
Mentor: Haishi Cao
Title: *Hydrogen Sulfide Detection Using a Fluorescence Sensor*

Hydrogen sulfide is a reducing agent present in human cells, particularly in the brain. Levels of hydrogen sulfide can vary, but studies show that Parkinson's Disease and Alzheimer's Disease patients could have significantly lower levels in their brain cells. H2S levels in a cell can be detected using fluorescence. Normal cells give off a green-yellow fluorescence of about 550 nm, but using H2S to reduce a molecule that gives off a cyanine fluorescence of 700 nm can allow detection of the H2S. A series of reactions can lead to a molecule whose N3 group is capable of being reduced by H2S. A starting material is created through a nitration reaction using 2,3,3-trimethylindole and NaNO3. This starting material is methylated, and the reduction of the nitro group is completed with zinc and HCl. Further reactions would create a molecule that contains two N3 azide groups capable of being reduced by H2S to give off the fluorescence needed to differentiate between the fluorescence of the cell and the fluorescence caused by the H2S.

Poster 56 – Seth Springer
Co-Authors – Karissa Finke, Laura Stoner, Abby Anthony, Andrew Flint, Justine Bauer & Chris Hernandez
Mentors: Allen Thomas, Huan-Chieh Chien, Kathleen M. Giacomini, Claire Colas & Avner Schlessinger
Title: *Optimization of LAT1 affinity for meta-substituted phenylalanine analogs*

The blood-brain barrier (BBB) separates the CNS compartment from the circulatory system. The L-Type Amino Acid Transporter 1 (LAT1, SLC7A5) is upregulated in many cancers and at the surface of the blood-brain barrier (BBB); thus, it could serve as a mechanism for targeted drug delivery. To attain this goal, a better understanding of the structure-activity relationship (SAR) of LAT1 ligands needs to be developed. Our group has been using computational models of its binding site to guide the design and synthesis of derivatives of the LAT1 substrate, phenylalanine. Recently, we found that meta methyl ester-substituted phenylalanine had comparable LAT1 affinity to parent (IC50s: 67 vs. 69 M, respectively), and surprisingly a meta carboxylic acid group was well tolerated (IC50: 139 M). These findings lead us to focus on the production of phenylalanine derivatives substituted with various carboxyl-containing groups and other polar functionalities on the aromatic ring. Specifically, we have synthesized various ester and amide constitutional isomers, different substituents on the carboxyl group, and para-substituted analogs to test the size constraints of the LAT1 binding site. Additionally, carboxylic acid, amine, and alcohol functional groups were incorporated to probe hydrogen bonding opportunities. The activity of these compounds was then determined using cis-inhibition and trans-stimulation assays with LAT1 overexpressing Human Embryonic Kidney (HEK-LAT1) cells. The results from these experiments show that the LAT1 binding site has considerable flexibility for accepting both polar and nonpolar substituents on the aromatic ring of phenylalanine. This SAR could be used for optimization of drugs that resemble amino acids or drug-amino acid conjugates (prodrugs) that are transported by LAT1. Thus, it has broad potential application for treating both CNS disorders and cancer.

Poster 57 – Laura Stoner & Molly Kohlbeck
Mentor: Kristy Kounovsky-Shafer
Title: *Utilizing 3D Printed Devices in Gel Electrophoresis to Elute Lambda DNA from an Agarose Insert*

Since the completion of the Human Genome Project, a new discipline focused on analyzing one person's specific DNA sequence has emerged, known as personal genomics. However, this sequencing requires large DNA molecules that are capable of covering large variations in the human genome. Large DNA molecules are hard to handle without breaking, so a method is required to concentrate large DNA molecules for sequencing or physical mapping. In order to combat this problem, we are eluting DNA molecules from a gel matrix, using 3D printed meso-fluidic devices, under an electric field and then concentrating lambda DNA. DNA is imbedded into an agarose insert to protect the DNA during lysis, but the electric field will drive DNA out of the insert into solution. In order to increase the amount of DNA that is

eluted, a pulsed square waveform is tested to determine the optimum on and off pulse times.

Poster 58 – Drew C. Thompson
Co-Author – Joshua Lallman
Mentor: Kristy Kounovsky-Shafer
Title: *Determination of electroosmotic and electrophoretic mobility of dyes in Kelcogel F for a dynamic range of ionic strength solutions*

In order to elute and concentrate extremely large DNA molecules in an electric field, the forces at play (electroosmotic and electrophoretic) must be determined in each type of matrix utilized in our elution-concentration device. Understanding how electroosmotic and electrophoretic forces vary, as ionic strength decreases, will enable better understanding of how DNA is eluted and concentrated in a dynamic range of ionic strength solutions. Depending on the matrices used, the charge on the matrix will affect the mobility of DNA due to electroosmotic forces. In order to create a Ferguson plot, four different concentrations of the gels (1.5%, 1.75%, 2.0%, and 2.25%) were utilized for each ionic strength solution. Utilizing 3D printed molds to create smaller gels—so all four gels fit in a larger gel box, a given matrix, such as low-acyl gellan gum (Kelcogel F), was pored and solidified in our molds. The ionic strength was varied from 16 mM to 0.5 mM. An electric field is applied for ~60 minutes and turned off. The overall mobility was determined for bromophenol blue and the electroosmotic mobility was determined for rhodamine B in each gel for each ionic strength using ImageJ. The free solution overall mobility and electroosmotic mobility was determined using a Ferguson plot. We found the overall mobility decreased as the ionic strength decreased, similar to what was determined for agarose. From these mobilities (electroosmotic and overall), we determined the electrophoretic mobility in a given ionic strength.

Poster 59 – Brooklynn Venteicher
Co-Authors – Colton Hall, Jerome Campbell, Chris Hernandez & Andrew Flint
Mentor: Allen Thomas, Huan-Chieh Chien, Kathleen M. Giacomini, Claire Colas & Avner Schlessinger
Title: *Synthesis and SARA of alpha-Quaternary Amino Acids as LAT1 Substrates*

The L-Type Amino Acid Transporter 1 (LAT1) is a vital transporter in the blood-brain barrier (BBB), and it is also upregulated in cancer cells. To increase its usefulness in drug delivery and for tumor imaging, the structure-activity relationship (SAR) for LAT1 needs to be better understood. We have been using the amino acid phenylalanine, a known substrate of LAT1, as a template for substitution in order to optimize ligand affinity. Our computational models of the binding site suggest that there is a narrow, hydrophobic pocket near the alpha carbon which potentially could be filled to improve substrate activity. We hypothesized that substitution at the alpha carbon of phenylalanine may improve LAT1 affinity. Thus, we prepared a series of alphaα-quaternary phenylalanine analogs and tested them in cis-inhibition and trans-stimulation assays using HEK cells with inducible LAT1. We

found that small and unbranched substituents (e.g. methyl and methythioethyl) were well tolerated; however, bulkier groups (e.g. isobutyl and benzyl) lost activity. The synthesis and SAR of these compounds will be presented.

Computer Science & Information Technology

Poster 60 – William Jones
Mentor: Sherri Harms
Title: *First Impressions of Social Media by Small Rural Organizations*

The purpose of this research is to determine the first impressions that local rural small businesses and non-profit organizations have about social media platforms. This research is being conducted along side the Social Networking general studies capstone class in the Department of Computer Science and Information Technology at the University of Nebraska at Kearney. In this class students prepare social media plans for local small businesses, however, it's been observed that often these plans are often abandoned by the organizations and not used. It is important to understand the initial attitudes towards social media that the organizations have, in order to help them achieve their social media goals.
A website was created to allow the businesses to take surveys as well as view resources designed to help guide them through the process of implementing their plans. We are in the process of collecting data at a series of intervals, by way of an online survey. This research provides the analysis of the first impressions held by small rural businesses toward social media usage, prior to the implementation of a social media plan. Our research continues over the course of two years, and will study how the attitudes towards social media change over time, with the introduction of a social media plan, as well as with external interactions with social media "tutors" that help them facilitate the implementation of these plans. Upon completion of the project, we plan to analyze the impact that the interactions had to help implement the social media plans.

Mathematics & Statistics

Poster 61 – Courtney Harwager
Mentors: Amy Nebesniak & Kaye Sorensen
Title: *Growth and Fixed Mindsets in Math Education*

Mindsets play a vital role in how a person views their knowledge on learning new things. For my literature review I researched information on the two types of mindsets: fixed and growth. A fixed mindset is when someone believes that intelligence is fixed and that one's intelligence can not expand. A growth mindset is when someone believes that he/she can always learn something new and that the brain will never stop learning new things (Dweck, 2008). Studies are being conducted on how knowledge of different types of mindsets can be applied

to various environments, including business, politics and education. My interests lie in the application of mindsets in education, specifically the teaching and learning of mathematics. Since many believe people can only be successful in math if they have a math gene or are a "math person," the study of mindsets in mathematics is incredibly important. Fixed mindset is an issue in math specifically because of the various stereotypes towards math, including the idea that faster means smarter. Research shows that there are many ways to help improve growth mindsets in mathematics education through different interventions including: preparation in the classroom, the way teachers teach, how students view failure/mistakes, through teachers' mindsets alone and how they can influence the students own mindsets, how parents and teachers praise the students, how homework is given, and how students are engaged in the classroom.

Poster 62 – Julie Kent
Mentor: Jacob Weiss
Title: *Analysis of certain zero parameter cases of difference equations*

In this paper, we consider aspects of equilibrium solutions of a planar system of difference equations defined on the open first quadrant and whose behavior is governed by four independant, non-negative parameters.

Poster 63 – Candy Smith
Mentors: Jacob Weiss
Title: *Equilibria of a Four-Parameter Rational Planar System of Difference Equations*

In this research, we consider aspects of equilibrium solutions of a planar system of difference equations defined on the open first quadrant and whose behavior is governed by four independent, non-negative parameters.

Physics & Physical Science

Poster 64 – Evan Folk
Mentor: Jeremy Armstrong
Title: *Harmonic Oscillator's Utility in Predicting Vibrational Spectroscopy*

A simple harmonic oscillator (HO) can be used to model a variety of physical phenomena. Using the average frequency of the particular bonds as input, a quantum HO was used to model the vibrational spectroscopy of different molecules. The values generated by the oscillator were compared with experimental infrared and Raman Spectroscopy data for each of the molecules. The HO's effectiveness was also examined for classes of molecules such as alcohols and ethers. A discussion of computational details including; writing a program to prepare input files, how to execute the HO, and how to discern the useful information from the output files will be included. In addition, the normal modes of organic functional groups were explored and detailed.

Poster 65 – Austin Ryan
Mentor: Adam Jensen
Title: *Analysis of an Eclipsing Binary Star Discovered using Kepler Data*

Using data from the Kepler Space Telescope K2 mission, I present the discovery of a companion star eclipsing HD 316072 and an analysis of it as a binary system. This target is interesting for a few reasons. First, it is a known x-ray emitter. The x-rays are currently attributed completely to its rapid rotation rate and stellar coronal emission rather than from a companion star. Second, the rotational variability period is almost equal to that of the period of the eclipsing orbit that we discovered. The Kepler Space Telescope's K2 mission goal is to provide the public with high precision photometry for exoplanet and astrophysics research. The fairly new EVEREST pipeline was used to reduce the dataset we were interested in. While exploring this dataset, the star HD 316072 was found to exhibit periodic dips in its light curve with characteristics similar to that of an exoplanet transit but unique enough to not be caught by a program search. Based on the analysis I will show, we believe that this is a previously unknown binary star, not a transiting exoplanet. This analysis will include polynomial fitting, normalizing, and stacking to characterize the transits and deduce the period of the system. We will also show how we used binary star software to produce preliminary physical parameters for this system.

Professional & Applied Studies

Communication Disorders

Poster 66 – Tejesvini Balaji
Mentor: Ladan Ghazi Saidi
Title: *The Effect on the Cognitive Reserve of the Elderly on Learning a New Language*

Healthy aging is partly supported by cognitive reserve; the ability to maintain daily activities despite aging disorders. In this literature, we review the concepts of cognitive reserve, the neural basis of the cognitive reserve and neuroplasticity. We discuss studies showing that speaking more than one language can contribute to a stronger cognitive reserve, and thus healthy aging. Further, we discuss the decreased likelihood of developing Alzheimer's Disease. To do so, we examine whether cognitive flexibility and executive cognitive control functions are enhanced as a result of bilingualism. Also, we compare the performance of monolingual and bilingual speakers in tasks measuring cognitive flexibility. In addition, we account for linguistic distance. Thus, we compare bilinguals whose languages are structurally similar as compared to those who speak languages that are not linguistically similar (for example, Spanish – English speakers vs. Mandarin – English speakers) is touched upon. This literature review will then explore the effect of learning a new language on cognitive reserve in elderly.

Poster 67 – Bryn Carriker
Mentor: Philip Lai
Title: *The Impact of Parent Behavior Through Eye Contact with Their Child with Autism Spectrum Disorder*

Communicative behaviors is an area of deficit in many children diagnosed with autism spectrum disorder (ASD). Typically, these individuals display deficits in three main areas: social interaction, communication, and restricted, repetitive, and stereotyped patterns of behaviors, interests, and activities (Center for Disease Control, 2014). In individuals diagnosed with ASD, eye contact with other individuals is very limited and not frequent. This research study analyzed the behavior of children in a social play interaction with a parent (i.e. mother). Data used for this project came from a prior research study conducted by the mentor of this study. Data was gathered from a social play interaction of thirty children with a mean age of 30 months. Fifteen children were verbal and fifteen children were non-verbal. To be in the non-verbal group, children had to have less than ten words at the time of the study, as indicated by their parents. Videos and audio of data were analyzed using the Eudico Linguistic Annotator (ELAN) software (Brugman & Russel, 2004; Lausberg & Sloetjes, 2009). Through ELAN, it was observed whether trends existed in the data with respect to mother's behavior that resulted in eye contact with their child. One pattern of

analyses in this study was to observe what parents were doing with their child that caused his or her child to make eye contact. To analyze the data, parent's behavior was investigated by examining two to three seconds before the eye contact occurred with their child. Findings from this research study will be discussed and can provide evidence of potential strategies for parents who want to engage with their child through eye contact.

Poster 68 – Sidney Delozier
Mentor: Ladan Ghazi Saidi
Title: *Neuroplasticity Induced by the Acquisition of a Second Language*

Introduction: The brain's ability to change in response to environmental stimulus, cognitive demand, or behavioral experience is neuroplasticity (Li, Legault, & Litcofsky, 2014). These changes can either be functional, referring to changes in brain processes, or structural, referring to physical brain changes such as fluctuation in volume or cortical thickness. There is evidence that second language (L2) learning induces brain plasticity (Li et al., 2014). The aim of this study is to investigate changes in cortical thickness resulting from learnt L2 vocabulary.
Methods: The participants consist of 12 native Spanish-speaking and 12 native Persian-speaking adults whose learning abilities show comparable cognitive control skills. All are healthy, have no history of neurological or psychiatric disorders, are between 26-66 years of age, and are not fluent in English. They are learning 130 French words through a computerized self-training audiovisual course involving verbal repetition and imitation. The stimuli are object images from equally distributed semantic categories. The vocabulary is controlled by phonological difficulty, frequency, and familiarity, and is semantically and phonologically similar to the participants' L1. The participants view the image, listen to the corresponding name, then repeat and imitate the target word. Participants practice for 15 minutes/day for 28 days. There are measure points after the first and fourth weeks of training regarding L1 and L2 proficiency. The participants' behavioral measures, functional connectivity integration values, and cortical thickness are acquired by viewing and identifying stimuli during fMRI scanning.
Results and Discussion: The results support the idea that L2 vocabulary learned through verbal repetition does induce neuroplasticity. The comparison of cortical thickness measures shows structural changes in some of the brain areas. The structural change across phases indicates neuroplasticity induced by vocabulary learning. These results have implications for prevention of neurodegenerative diseases and clinical implications for language rehabilitation (Ghazi-Saidi & Ansaldo, 2017).

Poster 69 – Shelby Hinrichs
Mentor: Whitney Schneider-Cline
Title: *Screening Speech, Language, and Reading Abilities of Home-schooled Children*

There are roughly 2.3 million children partaking in home-school education (Home Education Research Institute, 2016). Home-school education is growing, and occurs across race, geographic location, socioeconomic status, and gender (National Center for Education Statistics, 2016; Ray, 2016).

There are many reasons why parents chose home-school education (i.e., child's safety, religious beliefs, and dissatisfaction of the education system). Art, music, and P.E. classes along with other services are often offered to home-schooled families in multiple public learning arenas (National Center for Education Statistics, 2016; Ray, 2016; Viex, 2014). However, current literature lacks information about this growing population as far as home-school children's reading, language, and speech abilities. The current study's aim was to screen home-schooled children's speech, language, and reading skills to identify if home-school children were in need of further assessment in any of these domains. Participants in the study included seven school-aged children ranging from ages five to sixteen; their academic levels ranged from kindergarten to eighth grade. Graduate students in Communication Disorders conducted the screenings using the Diagnostic Evaluation of Articulation and Phonology Screening Assessment, Clinical Evaluation of Language Fundamentals, 5th Edition, Screening Test (language), and reading grade level passages (adopted from Shipley & McAfee, 2016). The participants' parents completed a survey that provided information regarding student demographics, family history, and specific strengths and weaknesses of each child. The results of the screenings revealed that most of the home-schooled children passed in the areas of speech (5/7) and language (6/7) but only three out of five passed the reading portion (two children were not old enough to participate in the reading screening). These results indicated that further assessment was recommended for four of the seven home-schooled children.

Poster 70 – Kathrin Roberts
Mentor: Whitney Schneider-Cline
Title: *The Use of Electropalatography and Traditional Articulation Therapy in Remediating Persistent Speech Sound Errors: A Case Study*

Established procedures of remediating articulation errors consist primarily of perceptual training followed by strengthening the production of the speech sound in question until it is consistently produced correctly. However, due to the nature of some articulation errors, it can be difficult for clients to understand the origin of the distorted sound (Gibbon & Lee, 2015). As technology advances, the field is keeping pace by integrating different devices to help remediate these sounds during therapy sessions. In this qualitative study, the use of an emerging technique known as electropalatography (EPG), in conjunction with traditional methods of articulation therapy, is analyzed for effectiveness in a case study consisting of one female Caucasian school-age client with persistent speech errors. EPG provides visual biofeedback via use of a sensor-covered artificial hard palate to support clients' more specific understanding of appropriate articulator placement for target sound productions (Dorais & Hart, 2010). Since EPG is still developing, studies on its effectiveness for all populations have not yet been conducted. Existing research suggests positive results in remediating several different types of speech errors, including lisps and incorrect consonant cluster production (Dagenais, Critz-Crosby, &

Adams, 1994; Lee, Gibbon, & Collins, 2010). Other studies support EPG use for certain populations, including individuals with cleft palate and apraxia of speech (Lee, Gibbon, & Law, 2008; Mauszycki, Wright, Dingus, & Wambaugh, 2016). However, a gap in the literature suggests the need for foundational case studies. The current study includes analysis of pre-, mid-, and post-treatment interviews with the client, clinician, client's parent, and clinical supervisor as means to explore the efficacy of EPG for a client with persistent speech production errors. Findings from the study revealed several themes including benefits of the technology (such as increased awareness of articulators) and challenges in its use (such as distortion of sounds during use).

Poster 71 – Elizabeth Tjeerdsma
Mentor: Jan Moore
Title: *Prevalence Of Hearing Loss in Church Staff Who Participate in Contemporary Praise Band Worship Services*

Prevalence of Hearing Loss in Church Staff who Participate in Contemporary Praise Band Worship Services
Permanent sensorineural hearing loss due to noise exposure, also known as noise-induced hearing loss (NIHL), has been observed in people who work in noise-exposed settings, specifically agriculture and manufacturing. Exposure to loud music has demonstrated noise-induced hearing loss from sources such as personal music players, participating in bands, and listening to performances from such groups (Gopal, Chesky, Beschoner, Nelson & Stewart 2013). Further one study examining noise-induced hearing loss in priests and worshippers in Brazil showed a high health risk due to the repeated noise-exposure found in the services they are involved in (Silva & Cabral 2011). In addition, studies conducted in Kearney, NE indicated that noise levels in protestant church services exceed levels known to be harmful (Moore, Lewis, Smijidir, & Johnson, 2013) and that participants in these studies exhibit negative changes in their hearing from participating in these services (Mannlein & Moore, 2015).
This study will examine hearing loss prevalence in praise band members, clergy, and other church staff who participate in contemporary praise band services. Our purpose is to identify persons with hearing loss and provide them with additional information on protecting their hearing. In addition, there may be differences in hearing status between gender as men are typically at higher risk due working in settings with greater noise exposure. Participants' age will also be taken into consideration, and his or her role within the service such as vocalist or musician.
We are in the process of assessing church staff in order to obtain adequate data for this research study.

Family Studies & Interior Design

Poster 72 – Alyssa Palmer
Mentor: Dana Vaux
Title: *Modeling Aquaponics, Creating a Template for the DIY Market*

The goal of the project is to design a micro Aquaponics unit suitable for the

"DIY" community to easily be made and brought into homes and businesses. This poster presentation documents the design process for this project. Aquaponics is the combination of Aquaculture and Hydroponics. It is the process of Aquatic plants being grown and farmed with the help of fish in aquariums or tanks. This method of farming is an economical and environmentally friendly way of conserving water while also benefiting the world with more pure and safe food growing techniques.

The University of Nebraska at Kearney has put together a research study to find other benefits of Aquaponic systems. The research being conducted is to find more health benefits, use more green technology, and identify the cost benefits of micro Aquaponic units. Dr. Vaux, Ms. Wetherall, Mr. Nordhues, and Dr. Sonja and Nate Bickford have been working together to create a unit to be tested in public and private settings to be used for observational research purposes. The custom units that were built however, have had some design issues that needed to be reconsidered and mediated; that is where my Undergraduate Research Project began.

After participating in observational studies, communicating with the faculty, and identifying the problems with the current unit, I worked to modify, design, and ultimately fabricate a "do it yourself" model that is still visually interesting and aesthetically pleasing, yet more cost effective than the custom made Aquaponics unit.

Poster 73 – Bethany Wilson
Co-Author – Shannon Duff
Mentor: Mickey Langlais
Title: *"He Said, She Said": Comparing Men and Women's Ideal Wedding Reception*

Weddings are often described as one of the happiest days that individuals experience in their lifetimes, particularly for women (Finkel, 2013; Purbink, 2014). Recent studies have emphasized that the experience of the wedding reception is positively correlated with marriage duration and marital happiness (Francis & Mialon, 2014; Joel, 2014). However, it is likely that the benefits of wedding receptions vary based on gender. Thus, the goal of this study is to compare and contrast male and female perspectives regarding their ideal wedding reception. Qualitative data for this study comes from 20 emerging adults (6 men and 14 women; Mean age = 20.5 years old). Participants answered semi-structured questions regarding various aspects of their wedding reception, which included questions regarding food, music, flowers, lighting, decorations, seating arrangements, venue location, and theme. Participants also drew a detailed floor plan of what they would want their ideal wedding reception to look like. Thematic analyses using axial coding was used to examine participant responses. Based on these responses, men and women had different preferences based on what they value in a wedding reception and also what they would want their reception to look like. First, both genders valued the venue for their wedding reception, but men were more likely to value food, whereas women were more likely to value decorations and wedding

reception theme. For the depiction of the wedding receptions, both valued having a DJ and having circle tables that could fit 8 to 10 people. However, the location of the dance floor, wedding cake, and bar varied by gender. According to these results, wedding reception preparation may be optimized by divvying up responsibilities that each gender values more. Further implications for wedding design will be discussed.

Kinesiology & Sports Sciences

Poster 74 – Holly Bower
Mentor: Kate Heelan
Title: *Attenuation of Excessive Weight Gain 1-Year Post Pediatric Obesity Treatment Program Initiation*

In the United States, the prevalence of obesity among 6-11-year-old children is 18.4% (Hales et. al, 2017). Over the past 30 years, family-based pediatric obesity treatment programs have been implemented demonstrating both short term and long term results (Epstein et al. 1998). Building Healthy Families (BHF) was adapted from Epstein's efficacious family-based weight control treatment program and implemented for 6-12 year-old obese children in a rural mid-western community. BHF has reached 58 families and 69 obese children (BMI percentile 96.5 ± 3.9%). Child health outcomes include a decrease in BMI percentile (3.1 ± 3.5%) at 3 months with a significant loss of fat mass (-6.36 ± 8.58 lbs) and increase in fat free mass (1.54 ± 2.99 lbs) at 6 months. Purpose. To determine attenuation of excessive weight gain by assessing body weight and height one-year post BHF initiation and compare to a match control group. Methods. Sixty-nine children participated in BHF (age: 9.30 ± 1.84 years) and 70 match control (age: 9.43 ± 2.08 years) were measured for height and weight at baseline and one year later. BMI and BMI percentile were calculated based on age and gender. Results. After one year, BHF participants grew 2.25 ± 0.97 inches and gained 7.66 ± 15.20 lbs resulting in a BMI percentile change from 96.41± 3.90% to 93.83 ± 7.68%. In comparison, the match control group grew 2.35 ± 21.05 in ($p>0.05$), gained 13.49 ± 11.05 lbs ($p<0.05$) resulting in BMI percentile change from 96.11 ± 2.74% to 95.46 ± 3.95%. Conclusion. Overall, one-year post initiation, control participants gained 43% more weight in one year while previously obese, BHF, participants gained equivalent to normal weight children demonstrating attenuation of excessive weight gain one-year post intervention.

Poster 75 – Jerromy Cissell
Co-Author – Logan Engel
Mentor: Kazuma Akehi & Gregory Brown
Title: *The effects of tart cherry juice on the inflammatory process in the biceps brachii muscles following strenuous exercise.*

Context: Strenuous exercise causes an inflammatory response in the muscles being used, which causes delayed onset muscle soreness (DOMS). Tart cherry juice consumption may decrease this inflammatory response, because it has anti-inflammatory effects. Objective: The purpose of the study is to measure changes of muscle size and echo intensity on the biceps brachii muscles

after eccentric-induced muscle damage and consuming tart cherry juice. Study Design: Factorial study with repeated measures. Participants: Twenty-four male college-aged (19 to 25 years) recreationally active (performing moderate exercise 3-4 times a week) and non-physically active individuals will be recruited. Procedure: Baseline measurements for height, weight, arm length, and biceps and forearm circumference will be taken for all participants. Then, each participant's biceps brachii muscle will be measured for muscle tissue thickness, subcutaneous tissue thickness, and echo intensity using the portable brightness mode (B-mode) ultrasound (US) imaging system. Participants will then be given enough tart cherry juice or placebo for the next 6 days. The treatment will be blind to the faculty investigator and participants will experience both treatments on different days. Upon their return, we will cause muscle damage by having participants perform 3 sets of 10 reps at 125% of their one rep max. After this, an US will be taken. The following day, participants will return for another US measurement after DOMS has set in. Thus, each participant will come to the PAWL five times in total and an US image will be taken at each visit. Hypothesis: We hypothesized that the tart cherry juice would decrease the muscle tissue size and echo intensity more compared to the placebo group after eccentric-induced muscle damage.

Poster 76 – Logan Engel
Co-Author – Jerromy Cissell
Mentor: Gregory Brown
Title: *Effects of tart cherry juice on delayed onset muscle soreness in college aged males.*

Background: Microscopic damage to the muscle cells caused by exercise, especially eccentric exercise, can result in delayed onset muscle soreness (DOMS). DOMS usually manifests itself 12 – 48 hours after exercise, can last up to 5 days after exercise, and is associated with pain, swelling, reduced muscular strength, and impaired recovery from exercise. Due to a high concentration of phytochemical antioxidants, anti-inflammatory compounds, and analgesics, tart cherry juice is purported to be a natural way to prevent or reduce DOMS. Purpose: The purpose of this study is to evaluate if consuming tart cherry juice ameliorates the effects of eccentric exercise induced DOMS. Methods: In order to determine if tart cherry juice reduces the effects of DOMS, college age men will be evaluated for symptoms of DOMS before and after a session of eccentric exercise accompanied by consumption of tart cherry juice or a placebo. In a randomized, cross over manner the participants will be assigned to consume either 8 oz. of tart cherry juice or a placebo twice per day for 6 days. On the sixth day, the participants will rate their perceived muscle soreness, have upper arm and forearm circumference measured, and then engage in three sets of 10 repetitions of eccentric biceps exercise at ~125% of 1-repetiiton maximum (1-RM), with the goal of the exercise session being to induce DOMS.

On the seventh day, the participants will consume their beverage in the morning. Then, later in the day, the participants will rate their perceived muscle soreness, have upper arm and forearm circumference measured, and perform two sets of biceps curl exercise to fatigue at ~70% 1-RM, with the goal of the exercise being to evaluate if muscular strength has been impaired due to the eccentric exercise on the previous day. Results: Data collection is currently underway.

Poster 77 – Andrew Fields
Mentor: Gregory Brown
Title: *Effects of a 4-week retraining program to increase stride frequency on¬ running economy in college aged males.*

Background: Running speed is determined by a combination of step length and step frequency. Step length is the distance from when one foot is picked up and put back down on the ground (i.e. pick up right foot, swing forward, put right foot on ground). Step frequency is how many steps are taken per minute. Sometimes, instead of step length and step frequency, running speed is described in terms of stride length and stride frequency, with a stride being both the right and the left steps. It has been a widely held assumption among the running community that a step frequency of 180 steps/minute is the most efficient cadence for most runners. This assumption is supported by many different research studies indicating that most elite or sub-elite distance runners have preferred step frequencies of 170-190 steps/minute at 65-75% of maximal oxygen consumption (VO2max). Most recreational or untrained runners have a step frequency much lower than this, typically around 150-170 steps/minute. Research, however, has not shown acute changes in step frequency to result in increased running efficiency. One way to measure the efficiency of a runner is running economy (RE), which can be measured as oxygen consumption (VO2) at a submaximal effort. In a study measuring acute changes in walking stride frequency on RE, walking at a stride frequency 15% higher than preferred frequency was found to increase VO2 by over 10%. In contrast, Hafer et al. observed decreases in biomechanical injury risks, but no significant differences in VO2 before or after a 6-week intervention to increase step frequency. This means that the increased step frequency improved running biomechanics without compromising running economy. Purpose: The purpose of this study is to determine if a retraining program of 4-weeks to increase step frequency to 180 steps/minute will alter running economy.

Poster 78 – Collin Fleecs
Mentor: Matthew Bice
Title: *Sleep Deprivation: Effects on Peak Power (Anaerobic Capacity)*

Many college students are enduring an increase in stress due to the increased responsibility of becoming an independent adult, and this stress may influence sleeping patterns. The effect of lack of sleep on short-term bouts of anaerobic exercise, however, is less documented. Physical performance is not only important for student athletes, but also for individuals looking to gain muscle, lose weight, or for those recovering from injury. The purpose of the

proposed study is to determine the effect of sleep deprivation on (a) peak power output, (b) mean power output, and (c) the fatigue index, measured as the percent decrease in power over the course of the Wingate bicycle test. Significant decreases in peak power and average power output were observed among participants after a full night of sleep deprivation among genders. This study revealed that both males and females produced greater peak power and average power in the evening trials of a day following a night of normal sleep in comparison to the morning trial of the same day. Results from the presented study suggest that sleep deprivation leads to decreased performance in anaerobic exercise, indicating that sleep is crucial for individuals the night before they anticipate performing anaerobic exercise. Data also supports the notion that individuals are capable of producing greater amounts of power in the evening than compared to the morning. Information is pertinent for athletes and individuals as they partake in activities of daily living.

Poster 79 – Bailey Flores
Mentor: Kazuma Akehi
Title: *Ulnar collateral ligament morphological characteristic adaptations in collegiate baseball pitchers*

BACKGROUND: Overhead activity athletes such as collegiate baseball pitchers exert immense forces through the medial elbow joint throughout the throwing motion. Repetitive near-tensile failure loads applied to the anterior band of the ulnar collateral ligament (UCL) during the acceleration phase of throwing results in microtrauma and may eventually lead to ligament failure. PURPOSE: The purpose of the study was to determine the effect of competitive collegiate baseball participation on UCL morphological characteristics adaptation on the pitching arm. METHODS: Thirteen college-age pitchers participated (Age=20.47±1.20yrs, height=188.34±6.23cm, weight=90.09±9.50kg, arm length=61.97±3.26cm, upper arm circumference=33.30±2.10cm, forearm circumference=29.65±1.27cm). All participants were on the active baseball roster. All participants were no known upper extremity injuries and neurological issues six months prior to the initial testing. The participants' UCL morphological characteristics were assessed using diagnostic ultrasound. Data collection occurred every four weeks from November to January (pre-season to in-season). RESULTS: We observed significant increases in the UCL length and width in the 3rd measurement compared to the 1st or 2nd measurement ($F_{2,28}=4.80$, $P=0.02$; $F_{2,28}=13.83$, $P<.001$). Forearm and upper arm circumference did not change in the measurements ($P>0.05$). DISCUSSION: This study has shown that the morphological characteristics of the UCL could adapt rapidly in a short time period. This acute adaptation in the beginning of the sport season provides superb data for understanding the stress demands and adaptations of the UCL in competitive college baseball participation. CONCLUSION: We have shown that the UCL adaptively responds to the sport specific demands. This will help clinicians and practitioners understand how the UCL morphological characteristics change in the beginning of a season

allowing for a possible injury risk screening method. Further research is needed to investigate whether the UCL adaptation continues as the season progresses or if there is a plateau in ligament adaptation.

Poster 80 – Kimberly Higgins
Mentor: Kazuma Akehi
Title: *Effects of the anterior cruciate ligament reconstruction surgery/rehabilitation on post-surgery knee functionality*

Context: An anterior cruciate ligament (ACL) tear is a common problem among athletes and the active population, and nearly always prohibits participation in activity for an extended period. As these populations go out into the world to work in a profession, an improperly rehabilitated knee can affect their quality of life, activity level, and home life. Objective: The purpose of the research is to examine correlations between different types of ACL reconstruction surgery and its rehabilitations, and the current knee functionality. Participants: One-hundred patients who received the ACL reconstruction surgery in the last 10 years at the local orthopedic clinic will be recruited through mail or email. Participants should be age of 19 years or older and have received ACL reconstruction surgery (hamstring graft, patella tendon graft, or cadaver graft) without having any complications such as fracture of tibia or femur. Intervention: After completing the informed consent form, participants will complete the questionnaire, either online or on a mailed survey. The questionnaire has 20 questions regarding physical and emotional health. The survey also asks patients to rate their general health, functionality of their knee, and everyday activities they are able and unable to perform. Following completion of the questionnaire, participants will return it to the investigator using the return envelope or submit it through the on-line version of the questionnaire for analysis. Hypothesis: We hypothesized that a hamstring graft combined with appropriate rehabilitation will provide the best chance for patients to have a better and active lifestyle post-surgically compared to the other surgical technique. Clinical/Practical Application: The findings will help to determine the optimal surgical and rehabilitative techniques used for these types of surgeries, and their impact on the patient for many years in the future.

Poster 81 – Allison Hirschman
Mentor: Scott Unruh
Title: *Extrinsic factors of anterior cruciate tears in division II female college soccer players*

The purpose of this study is to determine the correlation of outside factors that will leave female college soccer player between the ages of 19-25 more prone to tearing their anterior cruciate ligaments. A survey will be used and sent out to 12 division ll collegiate athletic institutions in the Mid-America Intercollegiate Athletics Association to obtain data from players who have suffered the injury itself. The survey will contain questions in regards to injured side of the leg, leg dominance, contact or non-contact tears, position on the field, surface of which they were playing on and weather it is the home ground surface, play time over the duration of the season, time (month) of

the season, brand of cleats/shoes that they were wearing at the time of injury, and an open ended question allowing them to describe any lower extremity problems they have been faced with prior to that specific injury.

Poster 82 – Bailee Jensen
Mentor: Bryce Abbey
Title: *Standing Height Classrooms*

Background: School-aged children are subject to sedentary behavior for most of their school day besides pieces of recess and physical education class. These behaviors can have a negative impact on student behavior and attention, energy expenditure, and body mass. Adding standing height desks allows improved energy expenditure, sedentary behavior, and possible classroom behavior (1). Blake, Benden, and Wendel found improved attention and classroom engagement with the implementation of sit to stand desks. As the students became more comfortable with the desks and standing, standing time increased (2). The traditional classroom involves students sitting at their desks which may impact the social aspect limiting the amount of students choosing to stand (2,3). Standing height desks can have many positive impacts on students health and behavior, but getting students to actually use these desks may be an issue (3). Some of the questions in research come from the effectiveness in standing desks to improve physical activity and energy expenditure (1, 4). Lanningham-Foster et. al found no significant difference between standing desks and sitting desks physical activity (4). Finding the strongest method for increasing physical activity and attention at a reasonable cost is necessary to improve education in school-aged children.
Purpose: The purpose of the current project is to collect and analyze the present research on sedentary behavior in schools. The information collected will be utilized in a future research project to fill the gaps and limitations on the topic to increase health in school-aged children.
Methods: The project will include the gathering scholarly, peer reviewed articles on sedentary behavior in the workplace through various research databases. The components that will be analyzed include study design, study population, measures of physical activity, health risks, analyses, limitations and results.
Results: Articles are currently being collected.

Poster 83 – Kylie Kenedy
Mentor: Matthew Bice
Title: *From Design to Dissertation: Undergraduate Research*

Health is an important concept and individuals can have a inaccurate perception of their actual health. My research project focuses on examining measured and perceived body mass index and individual perception of health and wellness. This project has spanned over 2.5 years of my academic career including research design, data collection, and data dissemination. The purpose of this presentation is to provide an overview of my entire project beginning with rudimentary ideas and ending in a publication in an international peer-reviewed journal. This presentation articulates the process and hard work, as well as the benefits that Undergraduate Research has provided me. This project

has provided valuable tools that will be crucial when I begin Occupational Therapy school in the Fall 2018.

Poster 84 – Callen Maupin
Mentor: Scott Unruh
Title: *Outcome Measure for Post-Surgical Shoulder Rehabilitation*

It has been estimated that 4.5 million of doctor visits a year are attributed to pain in the shoulder. The purpose of this study was to examine post-surgery shoulder rehabilitation outcomes from patients who underwent shoulder surgery and subsequent therapy at an outpatient clinic. 32 post-surgical shoulder injury patient's charts from 2011-2016 were examined and reviewed. The average age of the patients was 54.6±8.2 years and included 18 males and 14 females. Patient charts were analyzed, and pertinent information was coded and converted to digital format via Microsoft Excel under the direction of the attending physical therapist. All information related to patient identity was removed and are not included in the data set. Patient charts included diagnosis and surgery performed, attending physician, patient characteristics, descriptions of daily activities of rehab, and a daily patient subjective report. Patients were separated into one of 6 groups based on injury level and subsequent surgery performed: (1) biceps tenodesis (BT; n=4); (2) rotator cuff repair (RCR; n=5); (3) superior labrum anterior and posterior (SLAP) repair and a RCR (n=4); (4) BT and a RCR (n=14); (5) BT, RCR, and a SLAP repair (n=3); or (6) minor surgical procedures (n=2). Overall, the average length of recovery was 123.4±29.0 days. All 32 patients significantly ($p<0.05$) increased passive flexion, external rotation, and active flexion ROM during therapy (85.4±20.5°, 79.3±13.2°, and 48.3±21.7° respectively). Physician performing surgery (n=3) and physical therapist overseeing rehabilitation (n=8) have no significant effect ($p>0.05$) on patient length of recovery. Conclusions: The largest determinant for patient length and quality of recovery in post-surgical shoulder rehabilitation seems to be the severity of injury and subsequent surgery (attending physician and physical therapist seem to have minimal effects). Future research should examine effects of patient motivation and compliance to home exercise programs on effectiveness of rehabilitation.

Poster 85 – Jenn Nolda
Mentor: Bryce Abbey
Title: *Collegiate athlete use, knowledge, motivation, and source of supplement information*

Background. Previous research reported that up to 89% of collegiate varsity athletes use supplements, with the most commonly used supplements being energy drinks. (Froiland et al., 2004). In a cross-sectional study by Hardy et al., 2017, a relationship was identified between energy drink consumption, nutrition knowledge and sociodemographic characteristics in student athletes. Of those students who consumed energy drinks, majority were male, had overall lower nutrition knowledge, and had lower grade point average than did non-energy drink users. Previous research showed most athletes use a non-dietitian resource, such as athletic trainers, coaching staff, strength and conditioning specialists, as their

primary source of nutrition and supplement information (Torres-McGehee et al. 2012). However, Torres-McGehee et al., also found that overall Athletic Trainers and Strength and Conditioning Specialists had higher sports nutrition knowledge compared to coaches and athletes. Tian et al., 2009 reports that 86.4% of athletes surveyed were unaware that supplementation can have adverse effects. Hull et al., 2016 found that especially males may benefit from a Sports Dietitian that prevents dietary habits that are detrimental to their sports performance. Purpose. The purpose of this study is to evaluate collegiate athlete use, knowledge, motivation and source of supplement information. Methods. An electronic survey will be emailed to all current collegiate athletes at the University of Nebraska at Kearney using Qualtrics software. Results. Data collection is currently underway. The results of the survey will be reviewed and analyzed after all data has been collected.

Poster 86 – Stephanie Paulsen
Co-Author – Dakota Waddell
Mentor: Gregory Brown
Title: *Comparing the effects of coffee to a pre-workout drink on resting metabolic rate*

Caffeine is a widely used stimulant that is frequently consumed in the form of coffee and “pre-workout” drinks to ameliorate or delay fatigue, increase mental focus, or enhance athletic performance. The stimulatory effects of caffeine may increase resting metabolic rate and increase the oxidation of fats while reducing carbohydrate oxidation. PURPOSE The purpose of this study is to compare the effects of coffee and a commercially available pre-workout supplement on resting metabolic rate and substrate oxidation. METHODS After an overnight fast, males and females were measured for resting metabolic rate and then consumed coffee (containing 120 mg caffeine), decaffeinated coffee, a pre-workout drink (containing 120 mg caffeine), or a placebo in a randomly assigned cross over design. One hour post drink consumption, resting metabolic rate was measured again. RESULTS Heart rate, resting metabolic carte, fat and carbohydrate oxidation at rest will be measured using a metabolic cart. The data will be analyzed using a two way (treatment by time) repeated measures of analysis of variance (ANOVA) with a p-value of 0.05 (Sigma Stat 10, SPSS Inc, Chicago, IL). Significant main effects or interaction effects will be identified using a student Newman-Keuls posthoc comparison. CONCLUSION Data collection is currently underway.

Poster 87 – Lane Rohrich
Mentor: Kate Heelan
Title: *Assessing Youth Performance in a Community Outreach Program*

Background. Research has suggested that children and adolescents may safely engage in resistance training programs when following the age-appropriate guidelines to help improve their athletic performance. While training induced-strength gains in adolescents are more neurological than muscular, studies have shown significant improvements in motor skills and sports performance after resistance training (Faigenbaum et al., 2009).
Purpose. To evaluate the effectiveness of

the University of Nebraska Kearney (UNK) Community Outreach program for 12-16-year-old females to enhance athletic performance. The program encompasses speed, agility, power, strength, and flexibility within a 4-weeks resistance training program.
Methods. Nine female participants (age: 14.2 2.3 yrs; 125.4 17.9 lbs, 64.1 3.7 in) were assessed for agility (pro-agility time), speed (20-yard sprint time), strength (number of chair push-ups), flexibility (sit and reach), and power (vertical jump) at baseline and after 4 weeks of resistance training.
Results. Participants attended 8.4 1.7 training sessions over the 4 weeks. Significant decreases in pro-agility time (-0.11 0.11 sec, $p<0.05$), 20-yard sprint time (-0.17 0.19 sec, $p<0.05$), and significant increases in vertical jump (2.44 2.27 in., $p<0.05$), and chair-push-ups (4.78 6.06 reps., $p<0.05$) were experienced in 4-weeks. Although not significant, participants also increased their sit and reach test (0.442.32 cm, $p>0.05$).
Conclusion. Our results suggest that the Community Outreach program provided by the University of Nebraska Kearney may significantly impact speed, agility, power, and strength within a four-week period for adolescent female athletes.

Poster 88 – William Sinnard
Mentor: Megan Adkins
Title: *Examination of the Measurement Congruence between Interactive Health Spirit Technology™(IHT) and the ActiGraph GT3X Accelerometers: A Comparative Study in Physical Activity Levels of Children Completing the Fitnessgram PACER Test*

The Interactive Health Spirit Technology (IHT) device has become the newest technology being integrated into Physical Education curriculums across the country. The IHT device, is specifically developed for PhysEd classes, unlike any other activity tracking device to date. The IHT device completes measurement of heart rate and physical activity (PA) [low, moderate, vigorous] levels of a student by correlating heart rate data, and activity cut points using software developed by the IHT manufacturer. The IHT wearable device has the potential to be a measurement evaluation tool to help Physical Educators advocate for the profession, receive real time data, and have tangible evidence to share with parents. To date, the measurement accuracy of data collected in regards to PA levels from the IHT devices have not been explored, resulting in a largely unknown reliability of the data. Purpose: To examine the measurement congruence between Interactive Health Spirit Technology [Interactive Health Technologies LLC., Austin, TX, USA])(heart rate and low to vigorous physical activity (MVPA)), and the highly validated ActiGraph GT3X [ActiGraph LLC, Pensacola, FL, USA](counts & MVPA) in relation to PA level of students completing the 20m FITNESSGRAM® Progressive Aerobic Cardiovascular

Endurance Run (P.A.C.E.R). Methods: Students age 9 yrs and older who participate in the UNK home school teaching PhysEd lab (X male, X female) wore the IHT watch (wrist) and the ActiGraph GT3X (waist) concurrently while completing the standardized P.A.C.E.R. test. Data was collected and downloaded from each device. The data of the device was evaluated to determine the amount of physical activity time the student spent in low, moderate, and vigorous levels. The percentages of time in each PA level, of both devices, were then compared to determine equivalence between the two tracking monitors.

Poster 89 – Lindsey Smith
Mentor: Nita Unruh
Title: *Correlation of Participation in Club Volleyball Prior to College and Receiving Collegiate Volleyball Athletic Scholarships in the Midwest*

Obtaining a collegiate athletic scholarship is very competitive in today's globalized world of sports, especially in volleyball as youth participation continues to climb. Volleyball is becoming increasingly more demanding at younger ages, with longer seasons and more specialized hours in elite training. The forecasted product is elite athletes who stand out above the rest, but at a certain cost. Not only are club volleyball programs time-consuming, but very expensive, preventing equal opportunity to athletes. Year-round club sports are becoming more popular among youth with an increased trend in athletes specializing in one sport before puberty under the pressure of today's cutthroat world of sports recruiting as athletes are offered athletic scholarships as early as junior high school. As private club institutions continue to take over public athletic entities such as high school sports, the question begs to whether participation in club volleyball for several years prior to college is necessary to be noticed by college scouts. Through surveying 110 collegiate volleyball athletes, obtaining information about their club participation prior to college and their current athletic scholarship, there was no significant difference in scholarship dollars between athletes who participated in club and those who did not, concluding that club volleyball participation is not necessary to receive a collegiate volleyball scholarship.

Poster 90 – Taylor Stewart
Mentor: Megan Adkins
Title: *Examination of the Measurement Congruence Between Interactive Health Technology™(IHT) and the ActiGraph GT3X Accelerometers: A Comparative Study in Physical Activity Levels of College Runners.*

The GT3X accelerometer is highly regarded as a reliable means to measure physical activity in adults and children (Aadland, E., et.al., 2015) however, it is not a practical device for the general population. The Interactive Health Technology (IHT) wearable watch is a device seen readily in schools across the country to determine physical activity (PA) levels [low, moderate, vigorous] of their students, and has recently developed an App to move the watch into the adult population with collaborations with Adidas. PURPOSE: Pilot Study: To examine the measurement congruence between Interactive Health Technology [Interactive Health Technologies LLC., Austin, TX, USA])(moderate to vigorous

physical activity (MVPA)), and the ActiGraph GT3X [ActiGraph LLC, Pensacola, FL, USA](counts & MVPA) for quantifying proportion of time in moderate, and vigorous PA in adults completing a 5K running course. METHODS: Thirteen adults, (6 male, 7 female, 21.15±1.35 yrs) concurrently wore the IHT watch (wrist) and the ActiGraph GT3X(waist) while running a 5K course. Data was analyzedand MVPA was defined as movement ≥4 METs (Troiano et al., 2008). RESULTS/CONCLUSION: A moderate positive correlation existed between the GT3X and the IHT device in relation to total MVPA ($r=0.67$, $P<0.001$). IHT tends to underestimate vigorous exercise compared to the GT3X (11.50±9.39min: 17.58±10.36 min). Further investigation into the validity of the IHT monitor in relation to quantifying MVPA levels of individuals should be explored.

Poster 91 – Zach Sutton
Mentor: Kazuma Akehi
Title: *The Effect of Rock Climbing Hold Types on Muscle Force Production*

Rock climbing has increased in popularity dramatically in the last few years. While many factors contribute to climbing performance, one of the most important factors is forearm muscle strength. Limited research has been conducted on finger strength specific to climbing. Consequently, the purpose of this study was to determine the muscle force production of the forearm muscles on both sides between five different hold styles in the novice to intermediate level rock climbers. The participants then participated in a 10-week bouldering league where they climbed boulder problems once a weak in a competition style setting. Scores were obtained based on experience level, difficulty, and the number of falls. Fourteen climbers (males: age=21.86±2.73years, body mass=75.2±9.53kg, height=173.81±14.28cm; females: age=20.43±1.4years, height=164.25±2.62cm, body mass =59.36±8.27kg) voluntarily participated. Each participant's arm length, hand and finger length, upper arm circumference, and forearm circumference was measured. Then, each participant's grip strength (N) was measured by performing two maximum voluntary isometric contractions (MVIC), one on each hand, on each style of holds (jug, sloper, crimp, slopy crimp, and pinch) in vertical sitting position. Subjects then participated in a 10-week bouldering league and grip strength was reassessed. After the analysis, gender and time main effect differences were observed on grip strength for all holds, except for time on the jug (Female<Male; Pre<Post; Tukey-Kramer, $P<0.05$). Males also have longer hands and fingers and greater forearm circumference than females ($P<0.02$). In addition, there were moderate to high correlations between forearm circumference and grip strength (Tukey-Kramer, $P<0.05$). Based on these findings, climbing on a weekly basis for 10 weeks will significantly improve grip and finger strength. Due to the significant strength differences in males and females, further research is needed to identify gender differences in climbing performance.

Poster 92 – Danielle Tilley
Mentor: Megan Adkins
Title: *The Evaluation of Home School Physical Education Participant Perceived Versus Actual Level of Physical Activity.*

Children's perceptions of physical activity (PA) levels can vary, with many children believing they worked harder or lighter than reality. Accuracy (discrepancy between perceived and actual) of perceived PA exertion levels are important contributors to the three domain-specific components and motivational processes in Physical Education (PE). The purpose of this study is to examine simultaneously, the interrelationship among age and accuracy of perceived physical activity levels of elementary-aged children. Children (N= 57), ages 8-15 years, were given an explanation of the three different PA levels, and practiced activities related to each PA level to help them understand the different categories and how their bodies should feel after completing activities at each level. The children then completed PE classes for eight weeks. During the time, children completed self reports of perceived PA level categorized as low, medium, and high by placing a magnetic Plicker on a board which the teacher scanned after class to retrieve the data. The students wore an Interactive Health Technology heart rate monitor which correlated heart rate data and created activity cut points through the manufacturer's software to categorize the heart rate levels into PA levels of low, moderate, and vigorous. The results of the actual effort (IHT monitors) and the students' perceived effort (Plickers) will be compared in order to determine the accuracy of the children's perceptions. The results of this study will provide PE educators with information regarding students' age and the accuracy of their perceptions towards the workout.

Poster 93 – Dakota Waddell
Mentor: Gregory Brown
Title: *A Case Study Evaluation of a Commercially Available Pulsed Electromagnetic Field Mat on Bone Mineral Density and Muscle Mass in a Paraplegic*

Background: Paraplegia is paralysis of the legs and lower body, often caused by injury to the spinal cord. While loss of mobility is an obvious challenge with paraplegia, long term secondary health complications associated with paraplegia include osteoporosis and skeletal muscle atrophy, which can lead to further comorbidities. Conventional interventions using resistance exercise to prevent osteoporosis and skeletal muscle atrophy are of limited practical application in a person with paraplegia. Pulsed electromagnetic field therapy purportedly uses electromagnetic fields at a frequency that mimics a normal biological range to then increase the self-healing powers of the body. However, there is limited research evaluating pulsed electromagnetic field therapy on bone health in paraplegics. Purpose: The purpose of this study is to evaluate the effects of pulsed electromagnetic field therapy on muscle mass and bone mineral density in a paraplegic individual. Methods: A paraplegic individual from the local community who has been using dual-energy X-ray absorptiometry (DXA) to monitor bone mineral density and skeletal muscle mass has recently started using a commercially available pulsed

electromagnetic field therapy mat and has volunteered to be a case study subject. After approval for this project has been obtained from the IRB, this individual's DXA data will be evaluated for information on bone mineral density and skeletal muscle mass. This individual will also be questioned about the nature and duration of his paraplegia, his history of therapy to prevent osteoporosis and muscle atrophy, and his use of the pulsed electromagnetic field therapy mat. The information collected will be used to help evaluate the efficacy of pulsed electromagnetic field therapy on muscle mass and bone mineral density in a paraplegic individual.

Poster 94 – Darius Williams
Mentor: Megan Adkins
Title: *Athletic Retention in Former Collegiate Athletes*

Most collegiate student-athletes conclude their athletic career after their senior year, leaving behind the identity of being a college athlete. The retirement for student-athletes comes at a fairly young age, and at this time the student-athlete must begin to think past the athletic world. The influences from coaches, the public, and media glorify the athlete and overemphasize their activities. This can cause a difficult transition into redefining the student-athlete's identity without the sport, and engaging in physical activity outside of the athletic arena. Little research has been completed in relation to student-athlete alumni physical activity involvement, and their current identity in relation to the athletic sector. The purpose of the research project was to conduct a pilot study by surveying past UNK alumni student-athletes, using a validated online Athletic Identity Survey, to gain a better understanding of student-athlete alumni perceptions in relation to their current athletic identity, and physical activity regime/levels. The information gathered allows researchers to learn how to prepare athletes during the transition from the athletic to the real world lifestyle, and determine if further research should be conducted in relation to the topic of physical activity and athletic alumni.

Teacher Education

Poster 95 – Julie Bruns
Mentor: Toni Hill
Title: *Charting Communication: Examination of Early Childhood Communication Milestones*

For my research, I have been reviewing and analyzing several formal developmental charts related to early childhood communication. I have examined specifically the verbal language and auditory development milestones listed within formal charts. I have synthesized information from the developmental charts and developed cross-chart comparisons. The various developmental charts were compared and contrasted to the recent Centers for Disease Control and Prevention (CDC) milestones for early childhood. My reviews show that many of the milestone charts used with infants and young children lack clear reference to the verbal language and auditory pieces of their development. This lack of reference and inconsistency is a vital piece of developmental information for parents and caregivers to use as a resource in the care of infants and young children.

Poster 96 – Madi Casper
Mentor: Jane Ziebarth Bovill
Title: *Growth Mindset in Early Education Students*

This will focus on Growth Mindset and how to incorporate it into classrooms. The research primarily focuses on preschool classrooms but contains information for all grade levels. The definition of Growth Mindset is taken from Carol Dweck's research. In addition, the presentation will offer practical strategies to encourage a growth mindset in learners. The strategies will focus specifically on trigger words, phrases, and questions that will promote a growth mindset.

Poster 97 – Elaina Eddy
Mentor: Carrie Kracl
Title: *Teacher Perceptions and Effects of Sustained Silent Reading*

Sustained Silent Reading is reading silently for an amount of time in a distraction free environment. Sustained Silent Reading is an important attribute for literacy development. If students read daily and learn to enjoy it—they will become lifelong readers—which leads to improvement in many skills. However, reading instruction varies in schools. Many schools use incentive based approaches to reading. This teaches children to read for a prize, instead of reading to read. Many struggling students are assigned to read in isolation or assigned to finish homework during reading time. This method leaves struggling readers with little time to improve while good readers often have more time to practice their reading. Studies have shown that an effective Sustained Silent Reading focuses on routine, environment, access to materials, teacher roles, accountability, and time. This project administered a survey of teacher perceptions of Sustained Silent Reading to third grade teachers in a midsized Midwestern school district. Twelve third grade teachers participated in taking the survey and gave consent for obtaining Measures of Academic Progress scores of their students. Results from phase one of this study showed that teacher perceptions and methods of reading instruction vary. The keyword “time” was used when asked what the biggest struggle of daily uninterrupted reading is. Two participants with the highest growth in scores implemented Sustained Silent Reading every day for 20-25 minutes and the two participants with the lowest growth in scores did not implement Sustained Silent Reading every day. Results also showed that teachers in the study took time for reading, but did not always implement a distraction free environment or other factors that contribute to successful Sustained Silent Reading. Clearly, research shows that Sustained Silent Reading is an important factor for development of students.

Poster 98 – Elizabeth K Grenon
Mentor: Dena Harshbarger
Title: *Asking Questions to Ignite Curiosity in a Science Unit*

The purpose of this study was to determine if students benefited from receiving higher-level questions during a 3-day science unit. Twenty-eight fifth graders in a midwestern elementary school. The experimental group received higher-level questions that were imbedded into two existing lessons on

pulley systems from the FOSS-curriculum and a STEM lesson. The control group got the same lessons, but the high-level questions were not asked. Pre- and post-test scores were collected and analyzed using descriptive statistics. The ANOVA results revealed no significant difference between the groups. This result may be due to homogeneous grouping of students, teacher self-efficacy, and sample size. Study limitations and suggestions for future studies are discussed.

Poster 99 – Kylie Mohling
Mentor: Jane Strawhecker
Title: *Asking Questions in Mathematics to Ignite Elementary Students' Learning*

The purpose of this study was to examine how higher-level questions impact elementary students' knowledge and understanding of mathematics. The participants of the study were 23 fourth grade students from a Midwestern school district with an established partnership with the university. This study collected quantitative data gathered from pre- and post-tests from a designated Control Group and Treatment Group. Both groups were taught the same curricular math lessons over three days, but the Treatment Group's lessons included additional higher-level questions. The data was analyzed using a two-way analysis of variance (ANOVA) with repeated measures on one factor, time of test, to determine the statistical significance between the two groups. The results showed there was no statistical significant interaction between groups and test times as both groups made gains on the post-test at similar rates. This result may be due to the small sample size of participants and the short time frame for the study. Further limitations and ideas for future studies are discussed.

Graduate Studies

Kinesiology & Sports Sciences

Poster 100 – Ava Coughlin
Mentors: Todd Bartee, Kate Heelan & Paul Burger
Title: *Analysis of Cancer Survivor's Accessibility to Exclusively Tailored Exercise Programs in Nebraska*

Exercise has been shown effective in reducing side effects associated with cancer treatment, as well as improving cancer survivor's quality of life. More than 50% of Nebraska's population lives within two metropolitan areas which poses concern of accessibility to exercise programs for rural cancer survivors. Purpose: To examine cancer survivor's accessibility to exercise facilities (EF) and exercise programs designed exclusively for cancer survivors (EPCS) in Nebraska. Methods: Geographic Information Science (GIScience) was utilized to construct a spatial database consisting of: cancer patient survivors, EF, and identified EPCS, all geocoded from street addresses. Network analyses were performed to assess distance and travel time to both the nearest EF and EPCS. The U.S. Census Bureau's Core Based Statistical Area (CBSA) definitions for 2013 were used to categorize counties as part of a Metropolitan Statistical Area (MSA) or Micropolitan Statistical Area (mSA) and the balance, rural. Results: Multi-level geocoding of cancer survivors achieved a 99.9% match rate with 90.6% successfully geocoded to either a point or street address. Fifty-nine percent of survivors reside in a county classified as an MSA, 19% are in an mSA, and 22% are rural.

Survivors Distance (miles) Distance (minutes)
MSA to EF 3.2 ± 5.4 2.0 ± 4.1
MSA to EPCS 15.9 ± 28.8 10.9 ± 22.4
mSA to EF 6.5 ± 8.6 4.4 ± 6.4
mSA to EPCS 157.2 ± 122.4 114.9 ± 91.9
Rural to EF 25.8 ± 20.1 19.3 ± 15.4
Rural to EPCS 168.4 ± 124.5 118.8 ± 84.5

Conclusion: Exercise facilities are accessible to cancer survivors throughout Nebraska, however, EPCS are not located within a reasonable distance to rural survivors to facilitate participation. Future research should explore how existing EPCS can best reach more rural areas.

Poster 101 – Alexis Malmkar
Mentors: Todd Bartee, Bryce Abbey & Kate Heelan
Title: *Feasibility of Implementing a Healthy Vending Initiative on a Public University Campus*

Vending machines consisting of low-nutrient and high-energy-dense options have been identified as a possible contributor to weight gain on university campuses (Banna et al., 2017). PURPOSE: The purpose of this study was to evaluate the feasibility of implementing a healthy vending initiative

on a public university campus (enrollment ~7000). METHODS: Intervention partners (local public health district, mid-western public university, and vendor) agreed to implement policy to increase access to healthier food options to at least 30% of offerings in each snack vending machine. Twenty-one vending machines were evaluated for percent of items that met HEALTHY guidelines at baseline and after implementing policy using the Nutritional Environment Measures Survey-Vending (NEMS-V). Vending items were classified as HEALTHY based on Dietary Guidelines for Americans; ≤ 200 calories per package, ≤ 35% total calories from fat, and ≤ 35% weight from total sugars. . RESULTS: Zero snack vending machines met the 30% HEALTHY criteria at baseline, compared to 15% post policy implementation. The average percent of food items meeting HEALTHY guidelines increased from 20±3% to 27±4% ($p<0.05$) baseline to post policy inplementation. CONCLUSION: Although there was a significant increase in the percentage of HEALTHY options available in campus vending machines, the objective of 30% of HEALTHY options in each vending machine was not met. Working with the vendor company partner was more challenging than anticipated. For example, the vendor communicated that reaching up to 30% of healthier options in every machine would not affect revenue, yet only 15% of the vending machines on campus met the guidelines post intervention. The practicality of sustaining this intervention is in question based on partners' level of commitment. Future research should continue to investigate vendor policy implementation in light of inherent challenges of partner-based research.

Art Exhibit Abstract

Art

Jase Hueser
Mentor: Dan May
Title: *The Intersection of Aesthetics and Science*

There is a prevailing persuasion among philosophers, scientists, artists and laymen that a division ought to separate aesthetic philosophy and scientific understanding in any discussion on the topic of art. From this underlying principle, the assumption is that biological faculties affect aesthetic judgements only as far as sensory reception is concerned. That is, the immediate perception and interpretation of an object is carried out by sensory organs and the brain, respectively. Judgments as to the quality or pleasurableness thereafter are left to the ethereal realm of the mind and all scientific inquiry seems to halt. This short film uses collage and animation to present hypotheses proposed by Dennis Dutton and Vilayanur S. Ramachandran which source aesthetic pleasure to evolutionary adaptations, instinct and atavisms. Such theories include the Savannah Hypothesis and peak-shift tendencies. While these theories don't provide a comprehensive explanation for aesthetic development, they offer a foundational understanding of the intersection of philosophy and science.

Oral Presentation Schedule

Room: Ponderosa C

1:30 pm----- **Kathreine Anielak:** *Omaha and Prohibition: An Era of Change in the City* (Mentor – Jeff Wells)

1:45 pm----- **Jordyn Goodman:** *William Wilberforce: The Effects of One Life* (Mentor – Mary Beth Ailes)

2:00 pm----- **Cannon Marchand:** *The disarming of the Kearney state College Police Force during the era of civil rights and Vietnam* (Mentor – Jeff Wells)

2:15 pm----- **Megan Maul:** *The Social and Cultural Meaning of Kool-Aid* (Mentor – Jeff Wells)

2:30 pm----- **Kenna Grove:** *The Singular Generic They, or the True Comeback Kid* (Mentor – Megan Hartman)

2:45 pm----- **Ned Purdy:** *Loup City Historic Buildings Survey* (Mentor – Jinny Turman)

3:00 pm----- **Macey Stall:** *The Manuscript Diaries of Verna Holmes* (Mentor – James Rohrer)

3:15 pm----- **Erica Wood:** *The Reinvention of the Female Hero in Contemporary Arthurian Film* (Mentor – Rebecca Umland)

3:30 pm----- **Lacey Johnson:** *Effects of Types of Distractor on Performance in a Driving Course* (Mentor – William Wozniak)

Oral Presentation Schedule

Room: Ponderosa D

1:30 pm----- **Jasmine Beringer:** *"Spirits that rose out of the water": Gender, Place, and Poetry in Dorothy Wordsworth's Journals* (Mentor – Denys Van Renen)

1:45 pm----- **Tatiana Moore:** *One man, the media, and morale: S.Sgt. Hugh Benson and the Kearney Army Air Field* (Mentor – Jeff Wells)

2:00 pm----- **Shelby Larsen:** *Remade Fairy Tales: Making a Social and Cultural Commentary* (Mentor – Jessica Hollander)

2:15 pm----- **Mackenzie Marrow:** *Examining Shakespeare through a Cryptozoological Lens* (Mentor – Marguerite Tassi)

2:30 pm----- **Abigail Richling:** *“Paint Me an Angel”: The Eternal Exaltation of the Artist* (Mentor – Rebecca Umland)

2:45 pm----- **Kaitlin Schneider:** *Slayers, Superheroes, and Sexism: Evaluating the Decline in the Feminist Ideals of the Whedonverse* (Mentor – Megan Hartman)

3:00 pm----- **Ashley Shaffer:** *The Wraith* (Mentor – Megan Hartman)

3:15 pm----- **Mary Spencer:** *Greek Agents of Fate in Shakespearean Tragedy* (Mentor – Marguerite Tassi)

3:30 pm----- **Brittany Hanzlik:** *The Development and Assessment of Patient Self-Advocacy Workshops for Adolescents with Chronic Rheumatic Diseases* (Mentor – Richard Mocarski)

Oral Presentation Schedule

Room: NSU 310

1:30 pm----- **Michael Rohde:** *Why does the United States' Policy Give a Cold Shoulder to Such a "Hot" Issue as Climate Change?* (Mentor – Charles Rowling)

1:45 pm----- **Natalie Stanley:** *Biases in Reporting of Civilian Casualties Caused by U.S. Drone Strikes* (Mentor – Charles Rowling)

2:00 pm----- **Kalynn Stoner:** *Why States and International Government Organizations fail to intervene in acts of Genocide and Crimes Against Humanity.* (Mentor – Charles Rowling)

2:15 pm----- **Kato Craig:** *Does Age Equate to Competence?; Age-Based Laws as an Unsatisfactory Option to Measure Competence* (Mentor – Ben Malczyk)

2:30 pm----- **Shera Piercy:** *Self care practices in social work* (Mentor – Ben Malczyk)

2:45 pm----- **Kristen Tomjack:** *Study of the Binding Interactions between Human Serum Albumin and Alachlor and Alachlor ESA using High Performance Affinity Chromatography* (Mentor – Maha Younes)

3:00 pm----- **Shelbi Burke:** *A Comparison of Vocal Pedagogs- A Literature Review* (Mentor – Andrew White)

3:15 pm----- **Cole Chancellor:** *A study and wind band transcription of August Klughardt's Fest-Overture Op. 25* (Mentor – Brian Alber)

3:30 pm----- **Henry Gonzalez:** *Drone Warfare* (Mentor – Charles Rowling

Oral Presentation Schedule

Room: NSU 312

1:30 pm----- **Caleb Capellen:** *Polyamine Pathway as a Player in Breast Cancer Cell Proliferation in Diabetic Conditions* (Mentors – Surabhi Chandra, Matthew Dunworth & Robert A. Casero Jr.)

1:45 pm----- **Clarissa Fitzgerald:** *The Prevalence of Borrelia Lonestari in Central Nebraska* (Mentors – Julie Shaffer, Travis Bourret & Brandon Luedtke)

2:00 pm----- **Luke Hamilton:** *Three undergrads, three metabolites, in three years: A story about Baltimore Oriole physiology* (Mentor – Letitia Reichart)

2:15 pm----- **Sitong Liu:** *Phylogenetics and Divergence Times of California Floristic Province Menthinae (Lamiaceae)* (Mentor – Bryan Drew)

2:30 pm----- **Amber Menard:** *Antibiotic Tolerance in Staphylococcal Clinical Isolates* (Mentor – Austin Nuxoll)

2:45 pm----- **Makayla Nemecek:** *Longevity analysis of germ-free Drosophila melanogaster* (Mentors – Kimberly Carlson, Brad L. Ericson & Darby J. Carlson)

3:00 pm----- **Kati Frankenberg:** *Identifying the binding location of atrazine and two of its metabolites on HSA using high performance affinity chromatography* (Mentor – Annette Moser)

3:15 pm----- **Sidney Trenhaile:** *Study of the Binding Interactions between Human Serum Albumin and Alachlor and Alachlor ESA using High Performance Affinity Chromatography* (Mentor – Annette Moser)

3:30 pm----- **Connor Gosnell:** *Locating a Community Garden Using GIScience in Omaha's Food Dessert* (Mentor – Paul Burger)

Oral Presentation Schedule

Room: Sandhills Room

1:30 pm----- **John Rech:** *Motivated to Move: An Application of Older Adults and Motivation to be Physically Active* (Mentor – Megan Adkins)

1:45 pm----- **Jillian Rocheford:** *Environmental Effects on Patient Satisfaction in a Rehabilitation Clinic* (Mentor – Matthew Bice)

2:00 pm----- **Callen Maupin:** *Outcome Measure for Post-Surgical Shoulder Rehabilitation* (Mentor – Scott Unruh)

2:15 pm----- **Stephanie Slayden:** *Using the binomial transform for accelerated series convergence* (Mentor – Barton Willis)

2:30 pm----- **Halie Platt:** *Comparison of Generic vs. Specific Ad Copy in a Housing Context* (Mentor – Greg Broekemier)

2:45 pm----- **Nathan Lemmer:** *Assessment of effective bring your own device (BYOD) policy in the healthcare industry: an international comparison* (Mentor – Angela Hollman)

3:00 pm----- **Katherine Benner:** *Third Place Theory for Cancer Patients* (Mentor – Dana Voux)

3:15 pm----- **Shannon Duff:** *Where Two Become One: A Qualitative Examination of Emerging Adults' Ideal Wedding Receptions* (Mentor – Mickey Langlais)

3:30 pm----- **Molly Moeller:** *"To Check or Not to Check?": Examining Attachment Anxiety and Avoidance on Social Media* (Mentor – Mickey Langlais)

Oral Presentation Abstracts

Biology

Caleb Capellen
Co-Authors – Jose Ortega & Jane Morwitzer
Mentor: Surabhi Chandra, Matthew Dunworth & Robert A. Casero Jr.
Title: *Polyamine Pathway as a Player in Breast Cancer Cell Proliferation in Diabetic Conditions*

Diabetes/hyperglycemia has been known to increase cancer cell proliferation, leading to metastasis and even mortality. High blood sugar is also known to reduce the effects of cancer therapeutics. Polyamines (spermine, spermidine, and putrescine) which are involved in several cellular processes such as cell growth, replication, and transcription, have been shown to be elevated in certain cancers including colon cancer and skin cancer. We hypothesized that polyamines are involved with proliferation of breast cancer cells in diabetic conditions. Cell lines used in this study included MCF-7 (early stage breast cancer), MDA-MB-231 (late stage breast cancer), and MCF-10A (normal breast epithelial cells). Cells were treated with normal glucose (NG, 5mM) or high glucose (HG, 25 mM) in the presence/absence of polyamine pathway inhibitors. Both MDA-MB-231 and MCF-10A cells showed significant proliferation with HG treatment after 72 hr, which was not observed in MCF-7 cells. Simultaneous treatment with an ornithine decarboxylase (polyamine synthesis enzyme) inhibitor, difluoromethylornithine (DFMO) could prevent this effect. Interestingly, while spermine levels were not altered with HG treatment in breast cancer cells (MCF-7 and MDA-MB-231), they were significantly increased in MCF-10A cells. This is possibly due to the fact that cancer cells have endogenously high levels of polyamines, such that further increase is prevented to avoid toxicity from polyamines. Nevertheless, DFMO was able to decrease spermine and spermidine levels induced with glucose treatments, suggesting a role of polyamine pathway in regulating growth. Putrescine levels were undetectable in all samples. In conclusion, polyamine pathway is involved with HG mediated normal breast epithelial cell and breast cancer cell proliferation. Future studies will involve further analysis of the mediators which regulate polyamine production.

Clarissa Fitzgerald
Co-Author – Caitlin Ingram
Mentor: Julie Shaffer, Travis Bourret & Brandon Luedtke
Title: *The Prevalence of Borrelia Lonestari in Central Nebraska*

Borrelia lonestari is a bacterium vectored by Amblyomma americanum (the lone star tick) and is related to Borrelia burgdorferi, which causes Lyme disease. B. lonestari is suggested to cause variant Lyme disease, which has similar clinical symptoms of Lyme disease. In Nebraska, the tick that carries B. burgdorferi is not present, but reports of Lyme disease

occur every year and are later determined as false positives. This has created confusion in the medical field when trying to diagnose the etiologic agent. In this study, we collected A. americanum ticks, extracted total DNA, and performed PCR with a B. lonestari specific primer set to identify the distribution and prevalence of B. lonestari. We have confirmed that B. lonestari is present in A. americanum along the Platte River in Central Nebraska. Determining B. lonestari prevalence may aid in diagnosing disease and help gain a better understanding of the risk of variant Lyme disease in Central Nebraska.

Luke J. Hamilton
Co-Authors – Emma C. Keele, Marika A. Van Brocklin
Mentor: Letitia Reichart
Title: *Three undergrads, three metabolites, in three years: A story about Baltimore Oriole physiology*

When most people think about phenomenal bird migration events in south-central Nebraska, they think of the Sandhill Cranes. Justifiably so—the crane migration along the Platte is a truly awe-inspiring event. However, there is another great migration that comes to the Platte each spring, namely that of the Baltimore Orioles. Many hundreds of them migrate through the Buffalo County area each year—an exceptional concentration considering that this species does not typically form large flocks. Three years ago, in the spring of 2015, we began to study these orioles. We have collected a variety of data over the years, but we have focused on oriole physiology—specifically fat metabolism and muscle damage. The process of evaluating our results is ongoing, but so far we can say that our orioles seemed to have an abnormally tough migration season during 2016. This difficult season correlates with abnormal weather patterns on the wintering grounds of Baltimore Orioles: there was a strong El Niño during the spring of 2016. While correlation does not prove causation, our results support the idea that songbirds are sensitive to weather fluctuations from year to year. In light of this, we see that efforts to combat climate change—and the climate volatility that comes with it—are important for the future of our songbirds.

Sitong Liu
Mentor: Bryan Drew
Title: *Phylogenetics and Divergence Times of California Floristic Province Menthinae (Lamiaceae)*

Acanthomintha, Clinopodium, Monardella, and Pogogyne are genera of aromatic flowering plants within the plant family Lamiaceae (mints) that have centers of distribution within the California Floristic Province. The genera, particularly Clinopodium and Monardella, are taxonomically complex, and many species within the four genera possess narrow and/or relictual distributions. In addition, several taxa are threatened by urban development. We investigated relationships within the California Floristic Province Menthinae and also assess how the genera have radiated within and from California. Furthermore, a phylogenetic framework of these four genera will be instrumental in other ongoing studies regarding the timing and origin of California Floristic Province Madrean lineages.

Amber Menard
Co-Authors – Soeyoung Song & Sierra Kline
Mentor: Austin Nuxoll
Title: *Antibiotic Tolerance in Staphylococcal Clinical Isolates*

Staphylococcus epidermidis is a commensal organism normally found on the skin of mammals. As an opportunistic pathogen, S. epidermidis causes disease in immunocompromised individuals, mediated through indwelling medical devices. Antibiotic treatment of these infections is often unsuccessful, leading to chronic, relapsing infections with poor patient prognosis. A likely explanation for these observations is persister cells (a subpopulation of dormant cells) are causing treatment failure. High persister isolates have been shown to occur in other microbial pathogens such as Pseudomonas aeruginosa and Candida albicans. Recent work in the related pathogen, S. aureus, demonstrates persister formation is dependent on energy depletion through the TCA cycle. Therefore, we examined whether high persister isolates occurred among S. epidermidis clinical isolates through an energy dependent mechanism. We found S. epidermidis clinical isolates frequently have a high persister phenotype when challenged with vancomycin. To determine if this phenotype occurred through an energy dependent mechanism, we measured ATP concentrations in these isolates. Indeed, the majority of isolates with a high persister phenotype also showed lower ATP concentrations, suggestive of a TCA cycle dependent mechanism. Antibiotic treatment frequently fails, even among antibiotic susceptible pathogens. These preliminary results indicate persister cells are an important component in this process.

Makayla Nemecek
Co-Authors – Rebecca Best, Shelby Peters, Carlie Prososki & Lesley Towery
Mentor: Kimberly Carlson, Brad L. Ericson & Darby J. Carlson
Title: *Longevity analysis of germ-free Drosophila melanogaster*

Gastrointestinal microbiota and viruses are a key component in characterizing gut health and longevity. Nora virus, a persistent virus that replicates in the gut of Drosophila melanogaster, shows no lethality to the organism. Viruses similar in nature to Nora virus interact with gut microbiota, and the health of the organism and longevity may be dependent on a persistent viral infection. Our hypothesis is that Nora virus may be needed within the gastrointestinal tract of D. melanogaster to maintain a favorable environment for gut microbiota and increase the lifespan. Germ free D. melanogaster were generated with the use of antibiotics and divided into four treatment groups: Nora virus positive/bacteria positive, Nora virus negative/bacteria positive, Nora virus negative/bacteria negative, and Nora virus negative/bacteria negative. The presence of Nora virus was detected with the use of RT-PCR and bacterial species was determined by plating homogenized flies on Luria Broth plates. A longevity study was conducted on each of the treatment groups and demonstrated that Nora virus does not enhance longevity, but microbiota is needed when virus is present to live. This data suggests that

Nora virus infection is not beneficial to the microbial environment within the gastrointestinal tract, but further testing is needed.

Chemistry

Kati Frankenberg
Mentor: Annette Moser
Title: *Identifying the binding location of atrazine and two of its metabolites on HSA using high performance affinity chromatography*

Human Serum Albumin (HSA), the most abundant transport protein in blood, is able to bind a broad range of solutes including herbicides. In this study high performance affinity chromatography (HPAC) was used to measure the binding locations of atrazine and two of its main metabolites on HSA using competitive zonal elution and the probe compounds R-warfarin and L-tryptophan. The binding location of atrazine and its metabolites, hydroxyatrazine and deisopropylatrazine, was found to be Sudlow Site I due to the observed direct competition with R-warfarin. A separate competitive binding study with L-tryptophan showed no competition at Sudlow Site II.

Sidney Trenhaile
Mentor: Annette Moser
Title: *Study of the Binding Interactions between Human Serum Albumin and Alachlor and Alachlor ESA using High Performance Affinity Chromatography*

Human serum albumin (HSA), the most abundant transport protein in the blood, has been studied extensively for its binding interactions with drugs. However, very little research has been done to quantify the interactions of common herbicides and their metabolites with the two major binding sites on HSA, Sudlow Site I and Sudlow Site II. Two methods from high performance affinity chromatography (HPAC), frontal analysis and competitive binding zonal elution, were used to study the interactions between HSA and alachlor and one of its metabolites, alachlor ESA. Frontal analysis was used to measure the binding constant between the herbicide and HSA, and competitive binding zonal elution was used with the probe compounds, R-warfarin and L-tryptophan, to determine the location and/or competitiveness of alachlor's binding to Sudlow Site I and Sudlow Site II. From frontal analysis, the association constant (KA) for alachlor ESA was found to be 6.3 (±0.2) x 104 M-1 which indicates low to moderate binding. Competitive binding zonal elution studies with alachlor indicated noncompetitive binding in both Sudlow Site I and Sudlow Site II.

Communication

Brittany Hanzlik
Mentor: Richard Mocarski
Title: *The Development and Assessment of Patient Self-Advocacy Workshops for Adolescents with Chronic Rheumatic Diseases*

With young people now accounting for nearly half of the population worldwide, adolescents are becoming the center of global health policies. (Eleftheriou et. al., 2014). An extensive amount of research has been conducted on the preparation of

transitioning young adults with chronic diseases from a pediatric specialist to an adult specialist (Agarwal et. al., 2011; Eleftheriou et. al., 2014). The stage in which this preparation begins is early adolescence, an age group between 11 and 14 years old. Within this research, it has been found that a key component of a successful transition plan is the development of self-advocacy skills (Eleftheriou et. al., 2014). Self-advocacy allows individuals to engage in adult relationships, carry out responsible roles, develop abstract reasoning, and become more independent. Within a medical context, it promotes responsibility and involvement in one's self-care. The maturation of self-advocacy skills increases the prospects of adhering to medical treatments and optimizing health outcomes (Ardoin et. al., 2017). The purpose of the proposed intervention, a forensics-style workshop, is to teach adolescents with chronic rheumatic diseases to better self-advocate about their disease using competitive public speaking techniques.

To prepare young adults for their upcoming health care transition, this intervention-development project proposes to investigate a new approach by training adolescents in self-advocacy techniques for application in health care settings. Participants will engage in a workshop using proven techniques from competitive public speaking to ensure the development of effective strategies. Previous research has been conducted on these two factors separately, but never together. Therefore, this approach will make an original contribution to the field of communication as it attempts to determine the effectiveness of these techniques when applied to self-advocacy skills for adolescents with chronic rheumatic conditions.

English

Jasmine Beringer
Mentor: Denys Van Renen
Title: *"Spirits that rose out of the water": Gender, Place, and Poetry in Dorothy Wordsworth's Journals*

The diaries and prose works of Dorothy Wordsworth, sister to the famous Romantic poet William Wordsworth, remain criminally understudied even though they are beautiful accounts of the lives of Romantic poets and the surroundings that animate them. William is widely famous and studied and is accredited for the transition into the Romantic Era. However, networks exist between Dorothy's works and his, suggesting insights that fail to be recognized. Investigations into Dorothy's works lead to knowledge about the relationship and connection between Dorothy and William. Although William's affection for Dorothy is evident, he possesses a one-dimensional view of connection to place and nature, as opposed to Dorothy. "Tinturn Abbey" from William Wordsworth and Samuel Coleridge's Lyrical Ballads illustrates William's regret, as his connection to nature and place fades as he ages. William, in fact, does not fully realize the extent of what he is leaving behind in fulfilling social expectations. Still, in the same poem, William uplifts Dorothy, hinting that her freedom from the limitations of society allows her to fully experience an intimacy with nature and place. As her Grasmere journal illustrates,

the ability to foster this familiarity with nature and place hinges, too, on gender roles. Free from the external constraints that society tends to force upon men, Dorothy possesses, for example, the liberty to lay in bed all day if she has a bad night's rest. Through such instances, the journal conveys the inadvertent rhythms of Dorothy's life, in which she enthusiastically accepts the experience of living and with that, nature. Careful analyses into examples of this kind within Dorothy's journals prove instrumental to underlining women's contributions to Romantic thought.

Kenna Grove
Mentor: Megan Hartman
Title: *The Singular Generic They, or the True Comeback Kid*

Modern society is gradually progressing toward recognizing the fluidness and diversity that constitutes gender identity. However, in the English-speaking community, formal grammatical rules continue to lack a proper alternate pronoun for those who identify as gender fluid or other non-conforming identities. With the absence of such a pronoun, both gender-bias and sexist language continue to be common concerns for writers in academic settings. In response to these issues, the singular generic they is beginning to rise in popularity as a gender-neutral pronoun based on its historical background and ambiguity with gender when used in verbal speech. Many writers refer to style guides as tools to direct their work toward specific disciplines and tend to depend on their guidance for certain grammatical constructs. Several of these manuals, such as the popular publications from the American Psychological Association and the University of Chicago, have been progressively working toward resolving the issue of sexist language in regard to gender identity; however, none have yet taken the next step toward accepting a generic singular pronoun for non-conforming identities. This paper focuses on the history of the singular generic they and how it is progressively changing the way style guides are approaching the issue of sexist language. It has been revealed through comparing previous and current style guide publications, like the APA manual and Chicago style guide, that an emphasis on defining gender-bias language has been attempted in the newer editions. However, most of these manuals still advise that writers should completely avoid pronoun usage when referring to non-binary genders. Through my findings, my argument is that although the alternatives provided by these style guides are valid, the generic singular they is equally justified to be used as a gender-neutral pronoun in academic writing.

Shelby Larsen
Mentor: Jessica Hollander
Title: *Remade Fairy Tales: Making a Social and Cultural Commentary*

The presented piece is a remake, or possibly a continuation, of the "Rumpelstiltskin" story that everyone knows or has at least heard of. The goal of this paper, and other papers written for this research project, has been to bring out some problematic motifs that occur throughout fairy tales related specifically to gender, sexuality, and social structure. This project aims to point out, and sometimes attack, these repeated motifs

that occur in "original" fairy tales, including the idea that men are weak yet appear to hold a lot of power with a, typically evil, woman figure in the background or the idea that romances were quick in nature and were rarely agreed upon by both parties. The project has entailed reading "original" and remade, revised, or corrupted versions of fairy tales and understanding the purpose of them in their given time period. In reading these, the goal has been to track motifs such as men turning into various animals, making them seem less like sexual predators while at the same time either villianizing women or making them extremely pure in nature. Fairy tales are often presented with clear "good" and "bad" main characters, but today, we recognize that there is nothing purely good or purely evil. The submission includes both a creative and critical component as original writing is analyzed in the context of the traditional and remade fairy tales read. The goal in remaking these fairy tales is to make a contemporary social and cultural commentary using those reoccurring motifs in fairy tales that have followed us through time and are sometimes now still perpetuated in our culture today.

Mackenzie Marrow
Mentor: Marguerite Tassi
Title: *Examining Shakespeare through a Cryptozoological Lens*

I created and applied a new methodology of analysis that uses folkloric characters of different cultures as a way of explaining motives and actions of literary characters. More specifically, I analyzed the lamenting/cursing women and central villain of Shakespeare's Richard III through an understanding of the Navajo "Skinwalker" and the Celtic "Banshee." This unique analysis is a way to look at a cause of evil in literature that is not based on a tragic backstory or a mental diagnosis from the reader.

Abigail Richling
Mentor: Rebecca Umland
Title: *“Paint Me an Angel”: The Eternal Exaltation of the Artist*

Art is a large part of what makes us human. Humans naturally desire beauty; we wish to perceive that which provokes passionate feeling. We, as social creatures, desire to really feel the pleasure and pain of others, to understand them as best we can. This primal urge for connection through passion and beauty makes humanity inseparable from its art, and the artist inseparable from humanity. Therefore, when seeking to understand works of art, it is necessary to recognize that art is important because of its creator's desire to impart something that could only be described through the ineffable medium of art. This desire is what elevates art, making it the highest form of human expression. Those who possess the ability and the impetus to create art are therefore often elevated instinctively by others, sometimes to the point of pseudo-divinity. Often, a great artist will serve as subject and inspiration to other artists. Sometimes, the efforts of other artists and the awe of the wider world will lead to the apotheosis of the artist as an immortal being, one who lives forever as a bridge between the divine and the mundane, between artistry and normalcy. An artist is one who finds art the truest form of communication, one who values

expression far above existence. For some, this path leads to immortality. This paper explores the everlasting life of art and those who create it.

Kaitlin Schneider
Mentor: Megan Hartman
Title: *Slayers, Superheroes, and Sexism: Evaluating the Decline in the Feminist Ideals of the Whedonverse*

Ever since airing in 1997, Buffy the Vampire Slayer has caught tremendous amounts of attention regarding women's and gender studies. It is a well-renowned piece of American culture, and its nuanced characters offer a boundless area for studying gender. However, along with garnered acclaim, disputes have arisen. Does it deserve its reputation as a shining example of feminism, or is Buffy Summers just a superpowered, hyperfeminine individual who adheres strictly to established stereotypes? Buffy, while offering several characters that reverse gender norms, still possesses numerous controversial traits, especially in the depiction of heteronormativity and gender performance.

Buffy is known for its array of varied characters. The protagonist exemplifies this: a female in a typically male occupation as vampire slayer. Other characters like Willow and Faith offer variations of the typical female persona, employing rather atypical traits. However, even though these characters do transgress some gender boundaries, they, and many others, still majorly prescribe to traditionally heteronormative roles.

Heteronormativity stems from the expectation that men and women participate in monogamous relationships, with the man in power and the woman pretty and passive—notions that reflect preconceived expectations; these ideas arise in myriad romantic relationships throughout the series. Furthermore, even though later seasons depict diverse characters, traditional gender performance envelopes nearly everyone in the cast. Many of these characters are forced into circumscribed ideas of characterization. Take Anya, for instance, who begins as a vengeance demon and later becomes the usual love interest, not only prescribing to the typical human role, but to the "average" young woman motif, beauty expectations included. Even Buffy is forced into a limited persona at times, further indicating this occurrence. Although many Buffy characters offer some variation, they still mainly adhere to societal "norms," merely reinforcing traditional avenues of thought, rather than representing anything significantly groundbreaking.

Ashley Shaffer
Mentor: Megan Hartman
Title: *The Wraith*

For my research project, I have worked over the past year with Dr. Megan Hartman on writing a fantasy novel. This story is set in a world that sits parallel to our own, where magicians and monsters are real. It is told from the viewpoint of one of these monsters, a creature known as a wraith that feeds on humans, who goes from being loose on the streets of one of these magic cities to living life as a domesticated monster in a castle. The story is designed to explore class dynamics and the balance of resources. To help with the writing process, I have been drawing inspiration from The

Magicians trilogy by Lev Grossman and Neverwhere by Neil Gaiman, as well as learning more about writing from texts like Mark Forsyth's The Elements of Eloquence.
I will be reading the first chapter of my novel, which is designed to introduce the main character of the novel and hint at some of the later themes of the novel. Since the story's viewpoint character is a monster, this initial chapter is written like the beginning of a horror story. It begins by focusing on the victim, who suspects nothing, and then introducing the story's narrator as the monster who is hunting her. This scene sets the stage for the story by introducing normal life for the story's main character, before his normal life is disrupted by the novel's future events.

Mary Spencer
Mentor: Marguerite Tassi
Title: *Greek Agents of Fate in Shakespearean Tragedy*

"Oh, here / Will I set up my everlasting rest, / And shake the yoke of inauspicious stars / From this world-wearied flesh" (Shakespeare 5.3.109-112). Thus Romeo ends his life, leaving his star-crossed path behind and accepting with his lover the fate that awaits us all: death. The pervasive idea of a fated eye overseeing the actions of mortals is found in drama from the Greeks to the Bard and beyond. The personification of fate began in the Greek tradition as the Fates or Moirae and was continued by the Romans as Parcae. We see the influence of the Greek concept of fate in the tragic dramas of Sophocles and Aeschylus and find them again in Shakespeare through ways both human and natural. Seers throw themselves into Julius Caesar, a sonnet announces the star-crossed lovers in Romeo and Juliet, the Weird Sisters spur mutinous thoughts in Macbeth, and wailing widows create a cursed existence in Richard III. The ancient Greek, pre-Socratic philosopher Heraclitus made the statement "Character is fate." The main characters in these plays all have their own ideas about a fated life, from Julius Caesar's rejection of the warnings of the soothsayer to Macbeth's blind acceptance of the witches' utterances. By closely examining the utterances and actions by and toward these main characters, we can understand the influence of fate upon Shakespearean tragedy.

Erica Wood
Mentor: Rebecca Umland
Title: *The Reinvention of the Female Hero in Contemporary Arthurian Film*

The emergence of the female hero, often a warrior, in contemporary Arthurian cinema has prompted some critics to explain their presence as a means to meet audience expectations. However, as film critic Robin Rowland points out in her review of the film King Arthur (2004), the portrayal of Guinevere as a Celtic warrior harkens back to an ancient and revered tradition ("Warrior queens and blind critics" CBC News Online July 13, 2004), countering the idea that strong female figures are merely an invention of filmmakers motivated to sell tickets. Modern audiences are familiar with the portrayal of Arthurian women as derived from the world painted in medieval romance: passive heroines in need of rescue by a traditional male hero. However, this stereotype proves to be too restrictive: there is in fact a revered

tradition of the female warrior, which harkens back to the late Roman Empire and ancient Celtic traditions. In previous research, I consulted several Arthurian literary scholars and historians who cited examples of records by Roman historians and early ecclesiastical writers that provide evidence of the female hero as woman warrior in the Celtic Dark Ages. In my recent scrutiny of three films—King Arthur (2004), The Last Legion (2007), and King Arthur: Legend of the Sword (2017)—I have concluded that the female hero in contemporary Arthurian film invokes an enduring, if less familiar heritage, suggesting that current filmmakers who participate in the rich mythopoeic Arthurian legend are not motivated solely by selling tickets to contemporary audiences; their female heroes derive in part from an established tradition.

Family Studies & Interior Design

Katherine Benner
Mentor: Dana Vaux
Title: *Third Place Theory for Cancer Patients*

The purpose of this study is to analyze the different treatment methods that cancer patients and their families need for a healthy recovery, and to discover if there is any facility in Nebraska that implements them into a third place. More specifically, is there a location in Nebraska that allows for 24-hour drop in access, separate from the hospital environment, that provides opportunities for stress management and psychosocial care. Three key components to survivorship for cancer patients and their families were stress management, psychosocial care, and third place. These three factors were used to evaluate whether or not three built environments in the midwest had the necessary components for a healthy and complete recovery. This study was qualitative and included non-participation. Initially, information was gathered through a literary review, and an online analysis. Next a case study was established to research if there were any local facilities with all three components. The three locations that were analyzed were the Hope Lodge in Omaha, NE, the Dowart Cancer Care Center in Sydney, NE, and lastly the Gilda's Club in Kansas City. Each facilitator at the site was interviewed over the phone to gather more information.

Shannon Duff
Co-Author – Bethany Wilson
Mentor: Mickey Langlais
Title: *Where Two Become One: A Qualitative Examination of Emerging Adults' Ideal Wedding Receptions*

Weddings are momentous occasions that many describe as the happiest days of their lives (Finkel, 2013; Purbink, 2013). More importantly, recent investigations have described that the experience of a wedding reception is positively associated with global happiness on the wedding day, marital satisfaction for the first two years of marriage, and marital duration (Francis & Mialon, 2014; Standage, Harris, & Fox, 2014). Therefore, the goal of this study is to understand individuals' perceptions of their ideal wedding reception in order to design a wedding

reception that meets the majority of individuals' criteria for the ideal wedding reception. Qualitative data for this study comes from 20 emerging adults (6 men and 14 women; Mean age = 20.5 years old). Participants answered semi-structured questions regarding various aspects of their wedding reception, which included questions about food, music, flowers, lighting, decorations, seating arrangements, venue location, and theme. Participants also drew a detailed floor plan of what they would want their ideal wedding reception to look like. Thematic analyses using axial coding was used to examine participant responses. Based on these analyses, participants' primarily ranked venue location as the most important, meaning an inside or outside wedding, with the majority of participants seeking an indoor wedding venue. Participants viewed food and music as also important for the design of their wedding reception. Based on participants' floor plans, participants were evenly split based on the location of the dance floor, with half seeking to place the dance floor in the middle of the reception area, and the remaining wanting the dance floor separate from where guests would be seated. Thus, based on participant responses, two wedding receptions will be designed and presented based on participant preferences. Implications for client preferences with experiential design will be discussed.

Molly Moeller
Mentor: Mickey Langlais
Title: *"To Check or Not to Check?": Examining Attachment Anxiety and Avoidance on Social Media*

The majority of emerging adults have at one or more social media platforms that they visit regularly (Greenwood, Perrin, & Duggan, 2016). Additionally, social media usage is linked with the development (Fox, Warber, & Makstaller, 2013) and maintenance of romantic relationships (LeFebvre, Blackburn, & Brody, 2015). Based on this literature, social media can have both positive and negative effects on relationship quality depending on the social media behavior. However, many of these studies focus on a singular social media platform rather than examining multiple social media platforms simultaneously. Also, attachment anxiety and attachment avoidance may also be associated with social media use and relationship quality. The impact of social media behaviors for relationship quality may depend on attachment behaviors. Therefore, the goal of the current study is to examine how attachment avoidance and attachment anxiety predict relationship quality for established and developing relationships. Data comes from 183 college students (86.9% female, 87.4% heterosexual) who completed a daily diary for ten straight days regarding their social media use. Separate linear regression analyses were conducted to examine the relationship between attachment behaviors (avoidance and anxiety) and social media behaviors (monitoring, commenting, updating, private messaging, photos of relationship, and photos) for relationship quality in established romantic relationships and

relationships with crushes. Results of these analyses illustrated that anxiety moderated the relationship between commenting and posting photos of partners for relationship satisfaction for established relationships. Avoidance moderated the relationship between commenting and relationship satisfaction for established relationships. No interactions were found between attachment behaviors and social media behaviors for quality of relationships between single participants and crushes. Based on these results, attachment anxiety and avoidance can explain how social media impacts the quality of established relationships. Implications regarding attachment security and social media use will be discussed.

Geography & Earth Science

Connor Gosnell
Mentor: Paul Burger
Title: *Locating a Community Garden Using GIScience in Omaha's Food Dessert*

Suburban growth in America and the concurrent decline of inner cities has led to the expansion of large suburban super-market chains that follow population shifts and leads to a decline of neighborhood grocery stores (Altwitt and Donley 1997; Guy et al. 2004). What results are areas within the central city where a lack of variety of both healthy and affordable food options exist for those residents who remain. Food deserts, as they are commonly referred, are voids in the economic landscape where little or no competition exists and access to existing stores proves difficult for those of lower socio-economic status who remain in inner-city neighborhoods (Fury et al. 2001; Cummins and Macintrye 2002; Guy et al. 2004).
Eastern Omaha, Nebraska is one such inner-city food desert designated as low income with low access to supermarkets (USDA 2017). Community gardens have been introduced in these neighborhoods to increase accessibility to affordable fresh fruits and vegetables (The Big Garden 2017). This study uses Geographic Information Science (GIScience), locational-allocation and existing garden locations in conjunction with 2017 block group socio-demographic data to locate a new community garden. The minimize impedance (P-Median) algorithm identifies a new garden site east of 72nd street that minimizes the total weighted distance for all demand (households within the block group below the poverty level) among the community gardens (existing and new site).
Keywords: Community Gardens, GIScience, Site Selection

History

Katherine Anielak
Mentor: Jeff Wells
Title: *Omaha and Prohibition: An Era of Change in the City*

Prohibition of alcohol in Nebraska started one year prior to its national implementation and its introduction led to many changes in the different communities around the state. Changes were especially seen in Omaha, Nebraska, which had been a city riddled

with crime and alcohol abuse for years. While there were speakeasies and other stereotypical aspects of Prohibition in Omaha, overall the introduction of Prohibition led to a decrease in alcohol consumption in the city. Prohibition not only changed the social make-up of Omaha, it also affected the businesses in the area. My research began with secondary source research, looking at multiple historical works about Prohibition, both around the country and within specific cities. After conducting secondary source research, I composed a historiographical essay to further help the movement of the research project. Following the historiographical essay, I conducted primary source research, focusing on issues of the Omaha World Herald and the Omaha Bee. Primary research also included looking at advertisements and other paraphernalia from businesses in the Omaha area that were in operation during Prohibition. Originally, my research focused on crime during Prohibition, and whether or not crime was more prominent during the Prohibition than years prior. The main topic became more focused, however, after primary source research led to the new idea of looking at the effects of Prohibition on local businesses. Omaha may have had a violent time during Prohibition, but it is difficult to determine if it had a higher rate of crime during the Prohibition compared to the years prior due to a lack of statistical records during this era. Prohibition did affect local businesses in the Omaha area, and it also affected social aspects of the city, which will be examined in depth throughout this presentation.

Jordyn Goodman
Mentor: Mary Beth Ailes
Title: *William Wilberforce: The Effects of One Life*

William Wilberforce viewed the British Slave Trade as immoral and uncontrollable. He is one of the men that faced these troubles head on. William Wilberforce was a member of the British Parliament, an author, and Britain's best-known abolitionist. For William Wilberforce, the course ahead of him was clear but accomplishing it was a different matter. The goals set by William Wilberforce were unclear in the beginning but as he grew and matured as a man so did his dreams and ideas. It was through his passions, his friendships, and even in his religious beliefs that he could press on toward the goal. It was over the course of several years that Wilberforce changed how individuals thought about the Transatlantic Slave Trade as well as abolition of slavery itself. Wilberforce's leadership in the abolition movement was just a fraction of all that he did. His accomplishments were staggering, almost too many to believe. Wilberforce was one of the many successful social reformers in World History. It is through Wilberforce's worldview and his role that ultimately influenced and played a role in abolishing the British Slave Trade.

Cannon Marchand
Mentor: Jeff Wells
Title: *The disarming of the Kearney state College Police Force during the era of civil rights and Vietnam*

Today the University of Nebraska at Kearney police department is one of few unarmed campus police departments in

the country. Even so, UNK PD is a certified police department with full police powers. UNK PD officers are obligated to maintain safety for all people at the university. Members of UNK PD are real police officers expected to enforce laws and respond to incidents - all why being unarmed. This raises the question: why are they unarmed when most other police departments are armed? At the creation of the department officers did carry firearms, but a series of events transpired that leaded campus administrators to decide campus police should not carry firearms. The most widely reported reason is a 1969 shooting involving KSC officers. During the shooting, an officer killed a man. A court later determined the shooting to be justified. However, what was not justifiable to college leaders was a lack of formal training of their officers, and potential violence at KSC from civil unrest during the Vietnam War. Unarming the campus police was a decision made in both in the fact and feelings of the 1970s, but continues to impact the safety at UNK to this day.

Megan Maul
Mentor: Jeff Wells
Title: *The Social and Cultural Meaning of Kool-Aid*

I am Megan Maul, a member of Phi Alpha Theta and the Undergraduate Research Fellows program at the University of Nebraska at Kearney, and through URF, I have been researching the cultural and controversial history of Kool-Aid. I am researching this topic because I am from Hastings, Nebraska, where Kool-Aid was invented, and it had always been interesting to me. At the annual Kool-Aid festival, I have volunteered and participated in many activities pertaining to Kool-Aid, which has shaped my approach to this subject. In my first year of researching and collecting data through secondary sources, I have identified several cultural and controversial topics regarding Kool-Aid that are not mentioned during the festival such as mass suicide, the relation between Kool-Aid and low income families, and the many uses of Kool-Aid beyond a beverage. With the different resources found, I aim to investigate Kool-Aid's links to society.

Tatiana Moore
Mentor: Jeff Wells
Title: *One man, the media, and morale: S.Sgt. Hugh Benson and the Kearney Army Air Field*

The opening of the Kearney Army Air Field (KAAF) on February 1, 1943 in Kearney, Nebraska brought with it an abundance of changes. One such change involved the local radio station KGFW and the Kearney Daily Hub newspaper. Men at the base cooperated with these local agencies to provide entertainment and information to the men stationed at KAAF. Through the examination of the base newspaper and government documents, this research focused on the role Staff Sergeant Hugh Benson held in the development and use of media at KAAF. Most research regarding the base looks at the impact KAAF had on Kearney and its surrounding community. However, this research looks at one man's central role in the establishment of media use by the base, as well as the impact these media outlets had on the soldiers. Entertainment for the men and women stationed at the base was important for morale, as evidenced by the institution of the various

clubs, recreational sports, and organizations on KAAF. The production of the weekly Kearney Airbase News and radio programs were part of the need for entertainment, in addition to the need for knowledge of current events. The articles and programs with S.Sgt. Benson's name attached drew in followers around the base, incorporated people from the Kearney community, and contributed to the necessary morale boosts used by various agencies throughout the war. While it may not appear as much, S.Sgt. Benson's contributions at the KAAF and surrounding areas provided his fellow servicemen, servicewomen, and the citizens of the Kearney area with the necessary pride they needed to continue to serve their country.

Ned Purdy
Co-Author – Sydney Engel
Mentor: Jinny Turman
Title: *Loup City Historic Buildings Survey*

During the fall semester of 2017, students in Dr. Jinny Turman's Community History and Preservation conducted a historical survey of Loup City, Nebraska, for the Nebraska State Historic Preservation Office. This survey provides preliminary information that will assist the SHPO in assessing eligibility for listing properties on the National Register of Historic Places. Each student was given a section of Loup City's downtown business district. The process included preliminary research, a class trip to the town, and additional research using primary and secondary sources. Our project reports were divided into three different sections: a site overview, historical significance, and an architectural description. We also included a statement of recommendation for each individual property within the district.
To obtain the information relevant for the survey, in-depth research was necessary. Researchers were encouraged to interact with the local residents, contact the Loup City Historical Society, and examine Sanborn maps and other sources at our disposal. Researchers also were responsible for determining historical integrity and significance in accordance with criteria accepted by the National Register of Historic Places. This project allowed students to gain experience in research, evaluating community resources, and making arguments for preservation. Two students from the class, Ned Purdy and Sydney Engel, will present on their research process and findings from the historic buildings survey. This presentation will also show the importance of using community-based resources and architecture in historical research.

Macey Stall
Mentor: James Rohrer
Title: *The Manuscript Diaries of Verna Holmes*

This paper will discuss the value of diaries and their vital role in historical research, using the handwritten manuscript diaries of Verna Holmes as a case study. At the time she wrote these diaries, Verna was a young woman who lived in Overton, Nebraska, the daughter of Swedish immigrants. Although Verna kept a diary for many years, only three notebooks are extant, covering the years 1904, 1907, and 1909. During this period Verna attended Overton High School and Cotner University in Bethany, Nebraska.

Her diaries not only shed light on her experience as an adolescent woman living in Nebraska, but also on social and cultural life in the Progressive Era, the impact of The Union Pacific Railroad on Nebraska communities, and the immigrant experience in Nebraska during the early 20th century.

Industrial Technology

Nathan Lemmer
Mentor: Angela Hollman
Title: *Assessment of effective bring your own device (BYOD) policy in the healthcare industry: an international comparison*

Cyber threats are on the rise creating over fifteen different categories of external threats1 to organizations. Many organizations have experienced a loss of confidential information because of cyber-attacks, which creates a need for organizations to become proactive regarding cybersecurity3. In the healthcare industry, patient data must be protected from cyber threats. However, healthcare employees are actively encouraged to use their mobile devices for ease of accessibility and increased productivity. This creates a need for healthcare organizations to adopt a bring your own device (BYOD) policy before implementing the use of mobile technology2,4,5. Managers must understand the cyber risks and balance this with a manageable BYOD policy. Thus, the question: Are we effectively managing bring your own device (BYOD) security and policy in the healthcare system?
To further understand BYOD policy both technically and managerially, seven administrators at Nebraska regional hospitals and one Ireland hospital were interviewed. The researchers found that cyber threats are not perceived by managers to be as common in the mid-west region of the United States as in coastal states. Although several healthcare facilities are using mobile devices to aid with work efficiency, the concerns of cyber-attacks by management were low due to safe guards that were in place (e.g. no local storage on devices). The managers also expressed a sense of trust for the people that interacted with their facilities.
To gain a larger understanding of the BYOD security and policy in the United States healthcare systems, a survey instrument has been created. This instrument was generated from the qualitative data collected from the interviews above and based on variables taken from CITATION. The next steps in this project are to send out surveys and gain better quantitative insight into this issue. (Citations provided at presentation.)

Kinesiology & Sports Sciences

Callen Maupin
Mentor: Scott Unruh
Title: *Outcome Measure for Post-Surgical Shoulder Rehabilitation*

It has been estimated that 4.5 million of doctor visits a year are attributed to pain in the shoulder. The purpose of this study

was to examine post-surgery shoulder rehabilitation outcomes from patients who underwent shoulder surgery and subsequent therapy at an outpatient clinic. 32 post-surgical shoulder injury patient's charts from 2011-2016 were examined and reviewed. The average age of the patients was 54.6±8.2 years and included 18 males and 14 females. Patient charts were analyzed, and pertinent information was coded and converted to digital format via Microsoft Excel under the direction of the attending physical therapist. All information related to patient identity was removed and are not included in the data set. Patient charts included diagnosis and surgery performed, attending physician, patient characteristics, descriptions of daily activities of rehab, and a daily patient subjective report. Patients were separated into one of 6 groups based on injury level and subsequent surgery performed: (1) biceps tenodesis (BT; n=4); (2) rotator cuff repair (RCR; n=5); (3) superior labrum anterior and posterior (SLAP) repair and a RCR (n=4); (4) BT and a RCR (n=14); (5) BT, RCR, and a SLAP repair (n=3); or (6) minor surgical procedures (n=2). Overall, the average length of recovery was 123.4±29.0 days. All 32 patients significantly ($p<0.05$) increased passive flexion, external rotation, and active flexion ROM during therapy (85.4±20.5°, 79.3±13.2°, and 48.3±21.7° respectively). Physician performing surgery (n=3) and physical therapist overseeing rehabilitation (n=8) have no significant effect ($p>0.05$) on patient length of recovery. Conclusions: The largest determinant for patient length and quality of recovery in post-surgical shoulder rehabilitation seems to be the severity of injury and subsequent surgery (attending physician and physical therapist seem to have minimal effects). Future research should examine effects of patient motivation and compliance to home exercise programs on effectiveness of rehabilitation.

Jillian Rocheford
Mentor: Matthew Bice
Title: *Environmental Effects on Patient Satisfaction in a Rehabilitation Clinic*

INTRODUCTION. Rehabilitation environments have been densely researched; however, an evaluation between a physical therapy clinic environment and patient satisfaction presents a gap within the literature. The environment can play a vital role in patient rehabilitation, having either a positive or negative influence (Armatas, et al., 2007). Patient satisfaction is equally important and can have psychological and physiological impacts (Kornblith, et al., 2001). The purpose of the current study is to analyze the association between the environment of a rehabilitation clinic and patient satisfaction. METHOD. Patients (n = 103) were asked to complete a survey packet administered by their physical therapist upon discharge. The survey packet included the Post Occupancy Evaluation (POE), which assessed the environment based on POE constructs, including accessibility, cleanliness, temperature, noise, and light. In addition, the survey packet included a standardized Patient Satisfaction Survey (PSS) that was used to assess patient satisfaction. Data was kept in a secure area and the institutional review board approved the research protocol. RESULTS. Accessibility, temperature, noise, and lighting were

significantly associated with patient satisfaction ($p < 0.01$). A regression analysis found a significant influence of POE constructs on patient satisfaction, explaining 34.7% of the variance ($R2 = 0.347$) indicating accessibility, temperature, and noise have a significant influence on patient satisfaction in a rehabilitation clinic. CONCLUSION. Results from this study contribute to the literature determining variables that are important to new and veteran physical therapists. This presentation will demonstrate significant associations between environmental constructs and patient satisfaction. Further, this study will discuss constructs that can be used to predict patient satisfaction. Data from the current study can be utilized in rehabilitation clinics to enhance the patient's experience and impact patient retention.

Marketing & MIS

Halie Platt
Mentor: Greg Broekemier
Title: *Comparison of Generic vs. Specific Ad Copy in a Housing Context*

This cross-national project compares students' responses to classified advertisements with manipulated copy in a mid-sized Nebraska town and in Olomouc, Czech Republic. It also looks at college students' housing preferences in amenities, decision making features, and desired sources of information about housing. There is insufficient research of consumers' responses to advertisements when the copy is manipulated to include general wording versus specific wording in various contexts. Further, no research was found comparing United States housing preferences to those in the Czech Republic. Data were collected using a questionnaire on Qualtrics and analyzed using SPSS software. In Nebraska, students completed the questionnaire by clicking on a Qualtrics link in classes. In Olomouc, the questionnaire was passed electronically from student to student through the snowball method, surveying only English-speaking Czech students. Thus far, results show in Nebraska there are no significant differences in specific versus general wording as they relate to credibility of the ad, likelihood to visit property or likelihood to contact the listing agent. In the Czech Republic, there is not a significant difference in the credibility of general versus specific copy. However, there are significant differences showing that students viewing general copy are more likely to contact the agent and to visit the property when compared to specific wording. Both locations show a tendency to use price as the top decision making tool when choosing housing, followed by laundry availability in Nebraska and location of property in the Czech Republic. Using the general linear model, there was no interaction effect found between country and copy type when testing the credibility of the ad. There were interaction effects when testing the likelihood of contacting the agent and visiting property. This research will allow home owners and real estate agents to target their properties specifically to college students in both locations.

Mathematics & Statistics

Stephanie Slayden
Mentor: Barton Willis
Title: *Using the binomial transform for accelerated series convergence*

Our research focuses on showing that the binomial transform of a sequence will converge to the same number and also that the binomial transform will converge to this faster than the original sequence. We do this by first finding a recursive formula to calculate the binomial transformation of a sequence. Once we do this, the next step is to confirm that the binomial transform and the original sequence converge to the same number.

Music & Performing Arts

Shelbi Burke
Mentor: Andrew White
Title: *A Comparison of Vocal Pedagogs- A Literature Review*

This literature review looks at three important vocal pedagogy resources, Clifton Ware's Basics of Vocal Pedagogy, Richard Miller's The Structure of Singing, and Garyth Nair's The Craft of Singing. Each of these resources was a major vocal pedagogy resource of their own time and the authors were considered to be a leader in their fields. The purpose of this research was to compare the three and look at what trends changed over time and what fundamentals have remained. The research draws upon the authors' views on topics such as philosophy, physiology, acoustics, and diagnostics.

Cole Chancellor
Mentor: Brian Alber
Title: *A study and wind band transcription of August Klughardt's Fest-Overture Op. 25*

The use of transcriptions for the wind band genre is ever expanding and of vital importance to the growth of this field of music. This project set out to continue this expansion of repertoire for the wind band. The late development of the wind band means that the great composers, the Mozart's, Haydn's, and Beethoven's didn't have the opportunity to write for this ensemble or group of instruments. The importance for transcriptions has only increased as time has gone by. Not only does it help the development of the wind band, it also increases its repertoire, makes quality music more accessible, allows students to study the classic composers for more students, and it's allows for more pedagogical value for educators and students.
Klughardt is a more unknown composer from his area. This is a study of the composer Klughardt and of his style and technique as a composer. To do that, I must first talk about the history of Klughardt so there is some background information. Next is to talk about the processes of the transcription, the learning of instrumental tendencies and the composer. Because of the change of orchestration, I will talk about certain changes that I have made from the original that had to be adapted for the

change in instrumentation. There are some changes that had to be made because of the idiosyncrasies of each instrument. To be able to efficiently transcribe for an ensemble you have to be confident in your knowledge of instrument ranges, dynamic curves, timbre, dynamic ability, technical ability, and assimilation of instruments just to name a few.

Political Science

Henry Gonzalez
Mentor: Charles Rowling
Title: *Drone Warfare*

In recent years since the terrorist attacks that occurred on September 11, 2001, and the following war on terrorism, drone warfare has increased significantly as a military tactic by the United States. This procedure has become controversial for many reasons. To begin with, it challenges two important universal international laws, jus ad bellum which dictates the conditions under which a State may resort to the use of force and jus in bello, which is the means and methods of force a State may legally use. This has brought many scholars and lawyers to question the legality of the use of drones within international law and whether these laws need to be updated.

Michael L. Rohde
Mentor: Charles Rowling
Title: *Why does the United States' Policy Give a Cold Shoulder to Such a "Hot" Issue as Climate Change?*

In the last decade, climate change has become one of the preeminent driving forces of policy talks both nationally and internationally. As of May 2017, 70% of American adults accept climate change is happening, and 58% accept that it is mostly human-caused. So why does the U.S. federal government refuse to act upon the people's consensus? The U.S. has had a history of corporations using lobbyist tactics to cast doubt upon sound science and cause a standstill in policy action backed by science. The aim of my research is to explore and identify how and why this has happened and to also grasp how this history of lobbyism is currently affecting U.S. climate policy. The U.S. is considered the most powerful nation on many levels (militaristically, economically, politically. A nation's "soft" power is measured by their ability to deal with international altercations or agreements without the threatening or use of physical force, so in basic, their power to negotiate. The U.S. as the hegemon would hypothetically wield an immeasurable amount of soft power, but is this true? By researching international climate policy and specifically the Paris Climate Agreement, which is a key framework created by the United Nations, to combat global climate change, and is aiming to lower the temperature below the early 1990's period. Climate Change policy is a dynamic and a constantly evolving field because it is happening right now, and will continue to evolve into the future, because the technologies that affect climate both positively and negatively, also evolve. My research will answer why the U.S. has refused to act in international climate policy by breaking down and analyzing the historical framework of the current international climate policy, while also forming a better agenda for policy framework by showing

paths to improving current international climate policy.

Natalie Stanley
Mentor: Charles Rowling
Title: *Biases in Reporting of Civilian Casualties Caused by U.S. Drone Strikes*

The goal of this project is to explore how civilian deaths caused by drone strikes have been treated in both U.S. and British news coverage. Research suggests that national identity plays a pivotal role in determining how journalists are likely to cover controversial issues in foreign affairs. The hypothesis of this study is the more that civilian deaths are covered in the media-from both countries- the more critical the public will be of drone policy. This study will also explore the context in which civilian casualties are mentioned and whether the victims tend to be humanized. Finally, the link between U.S and Britain public opinion on U.S. drone policy will be examined. The data will be collected through content analysis of the New York Times and the Guardian from 2009-2016.

Kalynn C Stoner
Mentor: Charles Rowling
Title: *Why States and International Government Organizations fail to intervene in acts of Genocide and Crimes Against Humanity.*

After the Holocaust of 1945 the world stated that the types of atrocities that were allowed to happen under the Nazis would “never again” be allowed. Since 1945 there have been at seven genocides and countless instances where states have committed crimes against humanity. While none have been at the mechanized level of the Holocaust, places such as Rwanda, Cambodia, and the former Yugoslavia have been devastated by acts that the international community promised they would act against. Why have they been allowed to happen? By looking at the definition of what a genocide is that was agreed on by the national community, and the flaws that exist in it, we can see how states can keep events from being classified as a genocide. Next there is exploration into this new international norm called R2P, or the Responsibility to Protect, and the issues in that new norm. Finally the events in Syria are explored, and the problems on why it is so hard to intervene, on whether this is a case of genocide, and why the Responsibility to Protect has failed in Syria. All of these points are able to help the national community understand why States and International Government Organizations fail to intervene in acts of Genocide and Crimes Against Humanity.

Psychology

Lacey Johnson
Mentor: William Wozniak
Title: *Effects of Types of Distractor on Performance in a Driving Course*

While driving past a parked police car with its lights flashing, there may be a tendency for cars to drift towards the lights. This phenomenon has been coined the "moth effect," just as moths drift towards lights. Our aim was to determine if the moth effect is present when participants drive a vehicle on a path lined with external distractions, such as road signs and barriers, and whether local distractions and impairments, such as

texting, have an effect on the supposed moth effect. It was hypothesized that local distractions would enhance the moth effect seen while driving. Our design was completely within subjects and included 14 participants. They were instructed to try to steer straight while either texting, talking on a cell phone, wearing intoxication goggles, or driving with no local distraction. A video camera recorded the position of the vehicle, and later analysis was done on the videos to determine the amount of drift from side to side. A three-way within-subjects analysis of variance was conducted on the measurement of deviation from the center line. There was a significant main effect of external distractor ($F(8, 104) = 7.68$, $MSerror = 43.18$, $p < .01$) and a significant main effect of distance from the external distractor ($F(6, 78) = 2.57$, $MSerror = 1.07$, $p < .01$). There was a significant interaction of external distractor and distance ($F(48, 624) = 1.95$, $MSerror = 170.68$, $p < .01$). There were no other significant effects found. The scores indicated that participants, in all cases, drifted toward the left-away from the distractions. However, it seems that the moth effect was a reduction of that tendency to drift left, but still remain to the left of the center line.

Social Work

Kato Craig
Mentor: Benjamin Malczyk
Title: *Does Age Equate to Competence?; Age-Based Laws as an Unsatisfactory Option to Measure Competence*

The United States is a nation that has historically utilized law and order to ensure certain freedoms among its citizens. Many laws in America restrict the rights of individuals on the basis of age. This research examined the use of age-based laws as a means of measuring competence. Age-based legal areas include: Marriage and age of consent to sex, drug use, voting, gun ownership, etc. Law makers legislate on the consensus that competency can be measured by age. Most of the age-based restrictions are placed on the adolescent demographic. This research sought to answer two questions: why do law makers use age as a determinate of competence, and are there better ways to measure such competence? The key areas of research covered the creation and meaning of adolescence, the infantilization of emerging adults, the process of nudging, and their impact on age-based laws and competence in The United States.

Sherah Piercy
Mentor: Ben Malczyk
Title: *Self care practices in social work*

Compassion fatigue, burnout, vicarious trauma, and role ambiguity are real threats within the field of social services and can impact any agency or worker. Without proper interventions in place, social work could become just a monotonous job in which the worker is going through the motions causing interference with outside of work activities and having a negative impact on consumers receiving services. Studies reveal that while most Social Workers and other human service workers are aware of the risks associated with not practicing good self-care, many tend to neglect themselves until they are

in crisis. This is precisely what most agencies would like to avoid by identifying possible barriers to self-care practice. Interventions can be applied in the workplace environment to help alleviate some of these habits and encourage better self-care practice resulting in an overall improved quality of life.
This study has attempted to assess the self-care and trauma-informed care practices of a local agency, looking both at the individual staff members and the agency as a whole. Data was retrieved from a recent survey given anonymously and voluntarily in-house to agency staff. Measurements were based on workplace contentment, effectiveness and follow through in regards to supervisor expectations, trainings, and utilization of self-care and trauma-informed care.

Kristen Tomjack
Mentor: Maha Younes
Title: *Utilization of Mental Health First Aid Training in Undergraduate Social Work Education*

The topic of mental health has quickly become one of realized importance. Understanding mental health issues and how to effectively assist someone facing a mental health crisis can be a beneficial tool in today's society. Social work students need to have the appropriate skills to ensure that they are properly prepared to handle working with clients that may be facing a variety of struggles, including mental health. Mental Health First Aid (MHFA) training is a tool that can be used to give skills on how to properly handle a variety of situations regarding mental health. MHFA is an eight-hour training seminar intended to build students' mental health literacy and to promote their identification, understanding, and response to signs of mental illness. This can be an essential skill for social work students, especially because research shows that one in five American adults report experiencing a mental illness and account for nearly half of the health disparities affecting young adults in the U.S. (Merlanos, Nabors, Vidourek, & King, 2013). This research project will be looking at how many accredited baccalaureate-level social work programs utilize Mental Health First Aid within their own programs.

Graduate Studies Oral Presentation Abstract

Kinesiology & Sports Sciences

John Rech
Mentor: Megan Adkins
Title: *Motivated to Move: An Application of Older Adults and Motivation to be Physically Active*

Older adults are less likely to partake in physical activity (PA) due to various social, physical, and psychosocial constraints. Motivation can play an important role in understanding human behavior, specifically why and how older adults choose to partake in PA. This study attempts to use motivational constructs to explain the desire of older adults to engage in PA in persons 50 years and older who participated in the 2017 Nebraska Senior Games (NSG). Participants in the 2017 NSG completed a 40-item survey packet that included the PA and Leisure Motivation Scale (PALMS) and International PA Questionnaire – Short Form (IPAQ-SF). Ratings of motivation were compared to the self-reported amount of time spent engaging in PA. Significant findings were found and suggest older adults who partake in PA are motivated due to enjoyment, mastery, and affiliation. Findings suggest that different life components, such as age, gender, retirement status, and community type, have different influences on older adults motivation to engage in physical activity.

Index by Poster Number

Index of Participants

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