22nd Annual Research Week

2020

March 31-April 3

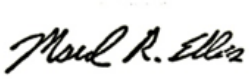
UNIVERSITY OF NEBRASKA UNK KEARNEY

Research Week 2020

Research Week is a collaboration between the Office of Undergraduate Research & Creative Activity, the Office of Graduate Studies, and the Division of Research to highlight the scholarly and creative activities of UNK's faculty, graduate, and undergraduate students. This multidisciplinary event serves as both a celebration of the fantastic work being done on our campus and as an intellectual platform for faculty and students to disseminate their work.

Student Research Day is a mainstay on UNK's campus and is an event to celebrate the amazing work of our talented students and their integration into the research enterprise. With Research Week, we are expanding our efforts with a stand-alone Graduate Research day and the unveiling of our annual faculty research magazine, *New Frontiers*. Please join us in celebrating the work and accomplishments of the UNK community.

Matthew R. Bice, Ph.D., Director
Office of Undergraduate Research & Creative Activity



Mark R. Ellis, Ph.D., Dean
Office of Graduate Studies

Richard Mocarski, Ph.D., Ast. Vice Chancellor
Division of Research

Schedule of Events

March 31 – April 3, 2020

Nebraskan Student Union

Due to public health concerns with COVID-19, Research Week was moved to an online conference.

Tuesday, March 31 — New Frontiers Reception

4:00 pm to 6:00 pm	Unveiling of the 2020 magazine, faculty spotlights, and a brief presentation at 5:00.

Wednesday, April 1 — New Frontier Faculty Presentations

12:00 pm to 1:15 pm	Faculty Presentations: Kimberly Carlson Annette Moser Lintz Kristy Kounovsky-Shafer Surabhi Chandra
5:00 pm to 6:15 pm	Faculty Presentations: Mary Harner Philip Lai Jacob Rosdail Mahmound Shakouri

Thursday, April 2 — Graduate Research Day

8:00 am to 12:00 pm	Students set up posters *(Ponderosa Room)*
1:00 pm to 2:00 pm	Poster Judging *(Ponderosa Room)*
1:00 pm to 4:00pm	Graduate Student Oral Presentations *(Ponderosa Room)* Open poster viewing *(Ponderosa Room)*

Friday, April 3 — Undergraduate Research Day

7:30 am to 9:00 am	Students set up posters *(Ponderosa Room)*
9:00 am to 11:00 am	Poster Judging *(Ponderosa Room)*
12:00 pm to 1:15 pm	Luncheon with Guest Speaker, Andrew Hansen *(Ponderosa A & B)*
1:30 pm to 3:45 pm	Oral Presentations *(Ponderosa Room)* Open Poster Viewing *(Ponderosa Room)* Graduate Program Fair *(Ponderosa Room)*
3:45 pm	Awards Ceremony & Reception *(Ponderosa A & B)*

Guest Speaker

Andrew Hansen

No stranger to higher education and academic research, Andrew Hanson currently serves an Associate Director of Development at the University of Wisconsin, where he works to advance the philanthropic support for the nationally-recognized Wisconsin School of Business. During his time as a student at the University of Nebraska at Kearney, Hanson participated in the Undergraduate Research Fellows program. His project focused on small group dynamics and the role they played in reality television. The study was published in UNK's Undergraduate Research Journal. Hanson received his bachelor's degree from UNK in 2016 with a major in sport management and minors in professional communication and media production. He received his master's degree in recreation, sport, and tourism from the University of Illinois in 2019. His master's thesis focused on the fundraising challenges and strategies that occur in the NCAA Division II athletics landscape. Hanson has given three national presentations on his research at academic conferences.

Table of Contents

Office of Undergraduate Research & Creative Activity

unk.edu/ugr

Undergraduate research is an important part of the fabric of the University of Nebraska at Kearney (UNK). UNK has a broad-based culture that supports students being involved in research, enhances the student experience, and provides skills that are transferable beyond the classroom or laboratory. The positive effects of the research-centered campus culture diffuses into student learning, attitude, and career choices with both professional and personal benefits including:

- Understanding research methodologies within a specific discipline
- Independent work and thought
- Problem-solving
- Written and oral communication
- Graduate school/research opportunities
- Career insight
- Self-efficacy

Within the scope of research, the Office of Undergraduate Research and Creative Activity supports the Undergraduate Research Fellow (URF) program and Summer Student Research Program (SSRP), which are both designed to create opportunities for undergraduate students to engage in student-led independent research studies. These programs provide opportunities for students to experience research/creative activities outside the classroom and creating a sense of "ownership" over the project. Each program contributes to a community of scholars that promotes student learning through doing.

The **Undergraduate Research Fellows (URF)** Program is designed to allow undergraduate students the opportunity to work under the supervision of a faculty member. This student-led research project allows students to develop an understanding of scholarly inquiry, skills associated with research and creative activity, and an ability to design and complete your own scholarly projects.

The **Summer Student Research Program (SSRP)** is an aggressive program spanning the summer months. Students and faculty mentors set forth with the goal of completing an entire project over the summer. Students can experience challenges and apply their knowledge and skills to solve new problems while also learning to understand the differences and connections between various fields of study.

UNK Graduate Programs

Art 308.865.8082

Art Education (MAEd)
- Classroom Education Emphasis ✳
- Museum Education Emphasis ✳

Biology 308.865.1589

Biology (MS)
- Thesis
- Non-Thesis✳

308.865.8346 MBA

Business 308.865.8240 LTC

Business Administration (MBA)
- Accounting ◆
- Generalist ✳
- Human Resources ◆
- Human Services ✳
- Marketing ✳

Long-Term Care Management (MS)

Communication Disorders 308.865.8300

Speech/Language Pathology (MSEd)

Counseling & School Psychology 308.865.8508

Clinical Mental Health Counseling (MSEd) ◆
Counseling (EdS)
Drug & Alcohol (Certificate) ✳
Higher Education Student Affairs (MSEd) ✳
School Counseling Elementary (MSEd) ◆
School Counseling Secondary (MSEd) ◆
School Psychology (EdS)

Education Administration 308.865.8512

School Principalship PK-8 or 7-12 (MAEd) ✳
School Superintendent (EdS) ✳
Supervisor of Special Education (MAEd) ✳

English 308.865.8299

English (MA)
- Literature
- Creative Writing
- Children's and Adolescent literature
- Writing ✳

History 308.865.8766

History (MA)
- Thesis ✳
- Non-Thesis ✳
- Public History ✳
- Public History (Certificate) ✳

✳Online Program ***◆Blended Program***

Kinesiology & Sports Sciences 308.865.8331

Athletic Training (MATR)
General Physical Education (MAEd)
- Sports Administration
- Recreation and Leisure

Exercise Science (MAEd)
Physical Education – Master Teacher (MAEd)
- Pedagogy ✳
- Special Populations ✳

Modern Languages 308.865.8082

Spanish Education (MAEd) ✳
Spanish Graduate Certificate ✳

Music 308.865.8618

Music Education (MAEd) ✳

Science/Math Education 308.865.8043

Science/Math Education (MSEd) ✳

Teacher Education 308.865.8513

Curriculum & Instruction (MAEd)
- Early Childhood Education ✳
- Elementary Education ✳
- Reading/Special Education ✳
- English as a Second Language ✳
- Secondary Education ✳
- Instructional Effectiveness ✳
- Transitional Certification ✳
- Montessori – Early Childhood ◆
- Montessori – Elementary I ◆
- School Librarian ✳
- STEM (Science, Tech, Engineering, & Math) ✳

Instructional Technology (MSEd)
- Instructional Technology ✳
- Information Technology ✳
- Leadership in Instructional Technology ✳
- School Librarian ✳

Reading PK-12 (MAEd) ✳
Special Education (MAEd)
- High Ability Education (Gifted) ✳
- Advanced Practitioner ✳
  - Behavioral Intervention Specialist ✳
  - Assistive Technology Specialist ✳
  - Inclusive and Collaboration Specialist ✳
  - Functional Academic Skills & Independent Living ✳
- Special Education Generalist ✳

For information contact:

UNK Graduate Studies
800.717.7881 | 308.865.8500 | gradstudies@unk.edu

Graduate Poster Abstracts

Fine Arts & Humanities

English

Poster G01 – Justin Horn
Mentor: David Vail
Title: "Where Meteorologists Fear To Tread": Weather Modification and Rainmaking in the Great Plains During the 1890s

On a humid afternoon in August 1891, the western plains outside of Midland, Texas erupted with the sound of cannon fire. The artillery barrage was not part of a battle, at least in the traditional sense, but part of a U.S. Department of Agriculture experiment to find out if cannon fire could produce rainfall. As ridiculous as this sounds to modern readers, there was "scientific" evidence backing the hypothesis. This thesis examines the scientific and technological attempts to modify weather in the nineteenth century Great Plains.

In addition to the "concusionist" operating in Texas, other attempts at weather control included the chemical rainmakers of the Great Plains. These "rain wizards" unleased chemicals mixtures into the sky to produce rain during the 1890s. These attempts were made by private citizens, including the major railroads, and claimed to possess artificial rainmaking technology which they used across drought-stricken Kansas and Nebraska. Professional meteorologist balked at these rainmaking attempts. But the objection of professional scientists did not prevent the con of artificial rainmaking in the 1890s.

Most work on the history of weather modification focuses on the post-WWII use of silver iodide. While studying the history of modern cloud seeding is important, it was far from the first attempts in America to modify the weather. Throughout the nineteenth century Americans relied on the power of science to bring forth water to the Plains. At various times "scientific" theories such as rain by concussion, rain follows the plow, and rain by secret chemical mixtures were all tried and competed with new irrigation technologies. Understanding the scientific reasoning behind past attempts at weather modification are important as we head into an uncertain future where climatic changes are of greater concern.

Modern Languages

Poster G02 – Sammy Jarquin Palacios
Mentor: Michelle Warren
Title: Bilingualism: changes on identity and/or personality of bilinguals

Are you a bilingual facing change on your identity and/or personality? You might feel familiarize with this topic and might experience a double, or changes on identity and even loss of identity and/or personality; this is a condition where many factors are involved, such as foreign language, age, culture and social environment. Some researchers have tried to study bilinguals' identity with personality tests in order to understand this unexpected fact.

Bilingualism is seen now normal in the U. S., the reason is because of the multicultural country we live in. Immigration is one feature of this factor related to bilingualism (Quinteros & Bates, 2017, p. 274), consequentially it creates a country full of people who come to the U.S. to live permanently. After moving to a new country and surroundings people will face new experiences where they will have to find a group to fit in.

This study focuses on finding changes on identity and/or personality of bilinguals, and also tries to understand why bilinguals feel different when they speak a second language or when they speak in different languages. Hamer's & Blanc's 2004 study (as cited in Grosjean, 1982) reports from anecdotes that bilinguals affirm that they do not feel the same person when they speak in their different languages. It is important to understand the way bilinguals feel according to their identities and personalities because many times they are unfair misjudged only for their accents. Accents are part of our background (Moyer, 2013), people tend to stereotype foreigners when they speak, the reason is for their accents, this leads to an unfair discrimination in different places, such work and schools (Itzhak et al., 2017, p. 50).

Behavioral & Social Sciences

Counseling and School Psychology

Poster G03 – Sydney Hansen

Mentor: Christine Chasek

Title: Media Perceptions of Mental Illness in the Aftermath of a Mass Shooting

The goal of this study was to discover whether the views of mental illness following a mass shooting differed between conservative and liberal news outlets. Fox News (conservative) and CNN (liberal) articles were gathered through an internet search specifying only articles including mental health and/or illness and those that written within the first 30 days of the shooting. A total of 66 articles were included in the study. Fox News had 22 articles and CNN had 44 articles. The results showed that the conservative news organization was more likely to include negative words/phrases than the liberal news organization.

Poster G04 – Kendra Hoffert

Co-Authors: Macey Kohls, Jordan Lempka, & Kenzie Drudik

Mentor: Tammi Ohmstede-Schmoker

Title: Comprehensive Examinations: A Scaffolding Model

Comprehensive examinations are a tool used by many programs to adhere to the NASP standards of demonstrating competency prior to beginning practice as a school psychologist. The School Psychology program at the University of Nebraska at Kearney utilizes the comprehensive examination as the final component in the scaffolding process of learning. Each year in the program, students are given increasing amounts of independence in completing case evaluations and provided with the opportunity to observe other students further along in the program present their cases. Through this approach, students are encouraged to learn not only from instructor/supervisor feedback, but also via the experiences of their peers.

Poster G05 – Schyler Johnson

Co-Authors: Sofia Hof, Kaitlin Bradley, & Bianca Witt

Mentor: Jesse Florang

Title: Screen Time

When people are on their technological devices, it may seem as though they are being less social, or their social skills are lesser due to their diminished social interactions. Nicolescu found that the new wave of technology has led to social integrations being performed through social media rather than human communication (2016). Rivera studied the effect in children rather than adults and concluded that because play is such an integral part in a child's physical and social emotional development, that playing video games could stunt that development (2009). Both researchers stated that more research should be conducted on the topic, so we surveyed 39 college students about their screen time usage as well as a questionnaire about their social skills. The results of the study told us that there was no relation between screen time and the level of social skills in the subjects. We conducted a post-hac review of the data and singled out cell phones from screen time. Our post-hoc results showed a positive correlation between using a cell phone and social skills. When people are on their technological devices, it may seem as though they are being less social, or their social skills are lesser due to their diminished social interactions. Nicolescu found that the new wave of technology has led to social integrations being performed through social media rather than human communication (2016). Rivera studied the effect in children rather than adults and concluded that because play is such an integral part in a child's physical and social emotional development, that playing video games could stunt that development (2009). Both researchers stated that more research should be conducted on the topic, so we surveyed 39 college students about their screen time usage as well as a questionnaire about their social skills. The results of the study told us that there was no relation between screen time and the level of social skills in the subjects. We conducted a post-hoc review of the data and singled out cell phones from screen time. Our post-hoc results showed a positive correlation between using a cell phone and social skills.

Poster G06 – Macey Kohls

Co-Authors: Kinzie Drudik & Jordan Lempka

Mentor: Tammi Ohmstede-Schmoker

Title: Self-Care as a Predictor of Job Satisfaction Amongst Educators

Teaching has been found to be among the most stressful occupations in terms of work-related stress. Given recent findings on a potential link between self-care and increased job satisfaction, exploring the benefits of self-care amongst educators is valuable. The purpose of our study was to examine if self-care is a predictor of job satisfaction for educators. Fifty-seven educators across the state of Nebraska participated in a survey in which they rated various indicators of self-care and job satisfaction. The results suggest self-care is a significant predictor of job satisfaction for educators in Nebraska. This indicates that the greater education system should place more emphasis on self-care, not only for current educators, but also for students enrolled in teacher education programs.

Poster G07 – Jacob Sandman

Co-Author: Jill Brichacek

Mentor: Douglas Tillman

Title: LGBTQ+ Research and Community Symposium: A First in Rural Nebraska

Our understanding of human sexuality and gender identity continues to grow and deepen, and society appears to be moving towards a more inclusive place. However, in some rural areas there remains strong anti-LGBTQ+ sentiments that are fueled by misinformation and harmful stereotypes of the people within this population. To counter this, we organized a day-long conference for our community in collaboration with several departments within our university system. This poster is a summary of how other rural schools can collaborate and create their own symposium to support the LGBTQ+ community. The primary focus of this symposium was the lived experiences of transgender people.

Poster G08 – Laurin Schleif

Mentor: Christine Chasek

Title: The Perception of Marijuana

Decisions are made every day, multiple times a day, ranging anywhere from being very simple ones (eat lunch) to very complex ones (where to attend college). An example of this scenario is the choice to legalize marijuana or not legalize marijuana in the United States, more specifically Nebraska. The purpose of this research paper was to gauge the degree to which the citizens of Nebraska are informed on the topic of marijuana in order to perceive if their decisions concerning the legalization of this drug are made with the facts in mind. The data for this study was collected from a survey that consisted of one question and three researched statements. It was distributed randomly to the citizens of Nebraska 18 and older mostly in the Lincoln and Kearney area. There was a total of 63 participants that completed the survey. The study resulted in supporting that how the surveys were answered determined how well informed the participants are. The scale constructed for the three statements were made with the idea that those who disagreed with them were less informed and those who agreed were more informed. There was a significant difference between those who answered yes and no in accordance with each the following scaled statements.

Poster G09 – Lauren Shepherd

Co-Author: Macey Kohls

Mentors: Jennifer Joy & Tammi Ohmstede-Schmoker

Title: Mindful Minutes in the Graduate Classroom

Mindfulness involves being present, nonjudgmental and open to experience. It allows us to become more accepting of ourselves as we are right now. According to Harpin, Rossi, Kim, and Swanson (2016), teachers who used a mindfulness program in their classroom have reported significant differences in prosocial behaviors, emotional regulation, and academic performance. Mindfulness education helps students with learning disabilities, decreases the impact of bullying, and helps teach empathy (Leland, 2015). Additionally, after a short program in mindfulness, adolescents have shown greater levels of optimism, and seen themselves as having more self-efficacy and adaptability, and lower levels of emotional reactivity (Malow & Austin, 2016). Thus, mindfulness can clearly benefit everyone involved in schools.

Educational Psychology

Poster G10 - Annie Fish

Mentor: Dawn Mollenkopf

Title: Resiliency in Relation to Adverse Childhood Experiences

Trauma is becoming a prevalent issue for students and teachers across the United States. Studies show that one in 10 students has had three or more Adverse Life Experiences (ACE's) before they are 18 (Child Trends, 2020). Furthermore, "approximately 66% of incoming college students report exposure to at least one traumatic stressor" (Warnecke & Lewine, 2019, p. 1). Resiliency is a topic many educators are becoming more interested in because it has been described as the way in which students are able to bounce back from stressful or challenging situations (Cheng & Catling, 2015). More resilient individuals are better able to cope with stress, and bounce back from setbacks (Luthans, Luthans, Chaffin, 2019). Student failure is a pressing issue in schools today, and one that is diverse and distinct in nature (Ayala & Manzano, 2018). However, "students perform better in school to the extent they are able to engage fully, cope adaptively, and bounce back from obstacles and setbacks in their academic work" (Pitzer & Skinner, 2017, p. 15). Consequently, resiliency not only impacts academic success but also sets the tone for future success (Change & Catling, 2015).

Natural & Physical Sciences

Biology

Poster G11 – Mikalah Brown

Mentor: Keith Geluso

Title: Effects of Rainfall and Cover-Object Size and Material in Detecting Herpetofauna in South-Central Nebraska

To examine community dynamics of reptiles and amphibians, researchers require robust and standardized methods to document the biodiversity of species. One method involves use of artificial cover-objects that individuals reside under for safety and other benefits. Cover-objects can consist of various materials. Our objectives were twofold. First, we examined use of large wooden, small wooden, and metal cover-objects to detect herpetofauna in Harlan County, south-central Nebraska. We examined which cover-object material and size was the best for documenting the most individuals and species. Second, we examined whether use of cover-objects was influenced by rainfall events. For this objective, we checked cover-objects immediately after significant precipitation events and during periods without rain for at least 2 days. Our studies were conducted in grasslands during warmer months, March 2016 to October 2019. We observed 9 species of herpetofauna, averaging at about 7 animals per day on "wet" days and about 4 animals per day on "dry" days. Herpetofauna used large wooden cover-objects (117 individuals) significantly more than small wooden (51 individuals) and metal cover-objects (4 individuals). Our study demonstrated that in grassland ecosystems of the central Great Plains, researchers can maximize time and effort by using large wooden cover-objects and checking object immediately after significant rainfall.

Poster G12 – Taylor Cassidy

Co-Authors: Kaley Keldsen & Kari Mohlman

Mentors: Letty Reichart, Melissa Wuellner, & Pricila Iranah

Title: Turtles vs Shorebirds : Competition for nesting sites on managed sand pits along the Platte River

Nesting habitat for endangered interior least terns and threatened piping plovers is managed on permanent off-channel sandpits along the Platte River in south central Nebraska. Historically off-channel sandpits allowed for increased nesting success of birds; however, nesting success has declined over time since initial construction, due to increased predation. In addition, soft-shelled turtles are now using the off-channel sites for nesting. Little is known about soft-shelled turtle nesting behavior on managed off-channel sandpits. Our objective for this study is to determine population size and habitat use by soft-shelled turtles nesting on permanent off-channel sandpits. We will trap and mark soft-shelled turtles, monitor turtle nesting behavior, and predator presence on off-channel sandpits. This data will allow us to determine if soft-shelled turtles are competing with birds for similar nesting sites. In addition, predation may be higher on sites where both shorebirds and turtles are nesting. Future work will allow us to determine management techniques to potentially decrease turtle nesting presence in order to facilitate increased nesting success of shorebirds.

Poster G13 – Amanda Medaries

Mentors: Dustin Ranglack, Melissa Wuellner, Letty Reichart, Pricila Iranah, & Michelle Fleig-Palmer

Title: Repairing Relationships: Providing the Glue to Mend Conservation Management and Public Opinion

Established in 2001, the American Prairie Reserve (APR) is a private non-profit organization whose sole purpose is to create the largest nature reserve within the continental United States. APR wishes to have support of conservation practices; however, local landowners and neighboring communities have not responded positively to APR's conservation efforts. Thus, APR seeks to determine ways to mend and improve relationships with local landowners and neighboring communities. The objective for this study is to identify ways in which to mend or mitigate a proportion of negative perceptions by local landowners using a systems thinking model approach. APR conducted a public perception survey to evaluate opinions of their current conservation practices. This data, along with socio-economic and management data from APR, will be used to populate a model to look at reinforcing and balancing feedback loops. We predict the model will be able to provide suggestions for how to rebuild relationships and have APR's conservation practices better well received by local landowners and communities.

Poster G14 – Alyssa Meier

Mentor: Dustin Ranglack

Title: Hunter Behavior and Harvest Success: the Effect of Hunter Movement and Site Selection on Observation rate of White-tailed deer (Odocoileus virginianus)

Hunting is the primary tool for population control for many ungulate species across the United States, including white-tailed deer *(Odocoileus virginianus)*. Previous research has focused primarily on the effects of hunting on prey behavior while neglecting the potential effects hunter behavior has on the probability of harvest success. Hunters make numerous active decisions while hunting that affect their probability of success, such as where to hunt on the landscape and hunting method (i.e. ground-blind, tree-stand, still hunting). Because wildlife managers rely on hunting for population control, it is important to understand and quantify hunter behavior to more confidently meet management goals. In this study, I will

examine hunter movement patterns and site selection and assess how these parameters affect hunter observation rate of white-tailed deer. The information provided by my research will help educate hunters on becoming more effective and efficient, and inform wildlife managers on methods to more reliably meet harvest quotas.

Professional & Applied Studies

CBT Career Center

Poster G15 – Mandy Sand

Mentor: Bree Dority

Title: College of Business and Technology, Career Center: An assessment of career endeavors post-graduation

The purpose of this research is to document the graduate placement report of CBT programs for the school years 2016-2017, 2017-2018, and 2018-2019. We want to track the employment, location, and salaries of CBT graduates. That information is used in conjunction with data on internship completion and career fair attendance. We want to be able to establish if any correlation exists between salaries and internship completion, job placement and career fair attendance, and hometown to job-town placement. Correlations can then be recognized and strategic plans can be made for recruitment purposes. This is an important issue for CBT due to the economic development focus our college has on central Nebraska.

Communication Disorders

Poster G16 – Laini Eddy

Mentor: Philip Lai

Title: The Effects of Teamwork on Verbal Output in Individuals When Completing Tasks of Varying Mental and Physical Exertion

Verbal communication is a vital contribution to successful teamwork. Successful teamwork requires an individual's integration of interests and multiple abilities to communicate a message successfully and execute a goal. The National Aeronautics and Space Administration (NASA) found that when communication is impacted, behavior and performance are adversely affected (Kintz, Chou, Vessey, Leveton, and Palinkas, 2016). The purpose of this study was to explore the influence of teamwork on one's verbal expression, and one's self-perception of teamwork on one's verbal expression. Will we observe a drop off in verbal expressivity during the interview based on difficulty of the last task? Will individuals who verbally communicated more during the teamwork task carry their expression to the interview? Will one's self-perception of teamwork correlate with communication based on their verbal expression during the teamwork task? Verbal output was compared in individuals completing team tasks of different mental and physical exertion. Comparing verbal output during the task and verbal output during a post task interview, results suggested a relationship between participants who lead with more verbal expressivity produced more verbal output in a post interview.

Poster G17 – Bailey Irwin

Mentors: Jude Matyo-Cepero & Dawn Mollenkopf

Title: Meeting the Needs of Twice Exceptional Children: Parent Perspectives on Services and Supports

The objective of our research was to determine who first identified a child as gifted, the parents or the school. We focused on parents of gifted and twice exceptional gifted children to inform researchers and parents on the importance of early identification and programing for gifted children, recognizing the implications of correctly identifying 2e children, as well as providing effective services and supports.

The methodology implemented for this research included a survey that was presented to parents of gifted and 2e children. The survey was available on Qualtrics. Parents were invited to participate via social media and at local gifted conferences.

Results indicated that parents are the first to identify their child as gifted, even if the child is 2e. Parents overwhelmingly understood that their child was gifted despite the masking effect.

This research is relevant to children, families and educators as it serves to offer insight on the complexity of identifying children who are both gifted and have an exceptionality. This topic supports a marginalized group of children who may be aware of their giftedness at a very early age, and may be attempting to communicate their abilities to their families, and/or educators, which may result in having to wait for their giftedness to be recognized and nurtured by those who have the ability to support and advocate on their behalf. This research is intended to positively impact the future behaviors of parents, and educators toward twice exceptional learners.

Educational Administration

Poster G18 – Alexis Allgood

Mentor: Michael Teahon

Title: A Community Approach to Early Childhood Education

The "Communities for Kids" initiative was created by the Nebraska Children and Families Foundation in response to community requests for assistance with shortages of high-quality early childhood and education programs.

Ten rural communities were selected for the initial cohort and have worked with Communities for Kids (C4K) for approximately three years. The focus of this study will be on collaboration efforts among the various entities within each of the communities and its impact on creating capacity for early-childhood opportunities.

Poster G19 – Alexsey Wolfe

Mentor: Patricia Hoehner

Title: Principals' View on Gifted Education

"IDEA and the basic need for competent administrations in the fields of gifted and special education has increased the need for better preparation program" (Milligan, Neal, and Singleton, p. 177). "As leaders, it is often the administrator whose beliefs, decisions, vision, and guidance help determine the status of services and opportunities for the gifted and advanced learners in their school" (Fisher, 2013). However, most programs for becoming a principal do not include extensive training in gifted education.

In order to have a better understanding of a principal's role in gifted program, a questionnaire was sent to Nebraska principals regarding the current status of the gifted program in their buildings. Included were questions on their interaction with parents with regard to information provided and avenues for input.

Our research will create a picture of principals' role in their gifted programs. Included will be the assessment of their programs and areas of strengths and weaknesses for future consideration.

Kinesiology & Sports Sciences

Poster G20 – Erin Anderson

Co-Author: Brittany Quinn

Mentor: Gregory Brown

Title: Blood Glucose and Carbohydrate Intake Lab

Carbohydrates are considered the body's main fuel source, the sugar is converted into glycogen that can be stored in the liver, muscles, and travel about through the blood stream. To monitor the amount of glucose in the body an Oral Glucose Tolerance Test can be performed that shows what a subject's fasting blood glucose is. With this information you can determine if an individual is at a normal amount of glucose in the blood, pre-diabetic, or diabetic. In this lab, done in class, subjects were asked to fast for up to 8 hours, take an initial blood glucose reading, drink either a sports drink or pop, and then monitored the subject's glucose levels for 3 more 15 minute intervals. The information provided shows how the glucose in the drink reacted with the body and which liquid had a higher glycemic index. The glycemic index of a food shows how fast the carbohydrate is able to be broken down by the body and enter the blood stream. From this data we can determine which drink is more beneficial during sports performance to get carbohydrates into the blood stream more rapidly.

Poster G21 – Yuki Hayasaki

Mentor: Kazuma Akehi

Title: Subconcussive Impact on Cognition and Psychomotor Properties for Adolescent Athletes

Background: There is a growing concern regarding subconcussive head trauma in athletes who participate in contact sports. Subconcussive impact is a lower threshold of impacts to the head repeatedly during their athletic participation. Such impacts to the head may alter brain structural, functional, and metabolic integrity. However, it is yet to be determined whether multiple subconcussive impacts the brain induce immediate and long-term deficits. Clinicians utilize the guidelines to provide appropriate care including the return-to-play protocol but yet fully recognized the return-to-learn protocol. The school attendance, homework, and academic testing can exacerbate or prolong the signs and symptoms of concussion. This can result in the prolonged return-to-play process. The previous report recommends complete cognitive rest or limited cognitive activity based on signs and symptoms. Concussed athletes surely can show decreased cognitive function and abnormal mental statuses, such as anxiety and depression. However, there are limited researches on the cognitive and abnormal mental status of adolescent athletes with subconcussive trauma. Objective: The purpose of the literature review is to critically examine the existing literature on subconcussive head impacts with an emphasis on short-term clinical outcomes of the cognitive and psychomotor properties for adolescent athletes. Methods: Studies of psychomotor, cognitive function, biomechanical, and symptom-based data will be identified via PubMed search and critically reviewed. Clinical Application: This literature review can assist the better management for adolescent athletes in the daily athletic training service in the case they have less cognition and abnormal mental status without the concussion.

Poster G22 – John Masker

Mentors: Todd Bartee & Kate Heelan

Title: Lifestyle Behaviors among Children with Obesity

Background. Individuals with obesity, especially children, are at greater risk of developing chronic disease later in life. Lifestyle behaviors have been shown to attribute to the development of obesity (CDC, 2016).

Purpose. This study will describe lifestyle behaviors including physical activity, sedentary activities and sleep among participants in a pediatric weight management intervention.

Methods. Participants included 62 children (53.23% boys;

80.6% white, 5-13 years of age (9.48 ± 2.25 years) with a body mass index for-age percentile ≥95 (97.13 ± 3.91%). Physical activity, sedentary activities, and sleep were measured using a questionnaire completed by participants' parents at baseline, 12-week post intervention, and 6-month follow-up.

Results. The average hours of sleep per night decreased slightly (9.72 ± 0.60 to 9.61 ± 0.74) across three time points. Physical activity minutes per week increased from 299.77 ± 312.89 at baseline to 453.45 ± 305.23 at 6 months. Computer screen time hours per week decreased from 14.41 ± 12.49 at baseline to 8.80 ± 6.21 at 6 months. Television screen time decreased slightly from baseline (14.05 ± 7.70 hours/week) to 12-weeks (13.01 ± 7.75 hours/week).

Discussion. On average, children in this study met the national recommendation for sleep but not physical activity or screen time. Although lack of sleep has been associated with obesity among adults, it does not appear to hold true for children with obesity. However, physical activity and screen time appear to be lower than recommended and should be the focus for lifestyle modification in addition to nutrition-related behaviors.

Poster G23 – Stefanie Neal

Co-Authors: Alicia Olson & Hayley Murphy

Mentor: Megan Adkins

Title: Empathy in Action: Building a Pathway to Acceptance of Disabilities in Sixth Grade Students

This study aims to determine if empathy through a simulated experience of a disability will improve acceptance of individuals with a disability in middle school students. Middle school students become increasingly aware of social competence and peer acceptance as they approach adolescence (Cassidy & Asher, 1992). This time can be crucial for building relationships for both typical and atypical developing students, especially together. As social competence and peer acceptance increase, the chances of students being deemed socially acceptable or not increase as well. Previous research found that students with severe disabilities often have fewer opportunities to develop friendships (Hendrickson, Shokoohi-Yekta, Hamre-Nietupski, & Gable, 1996). Due to this evidence, it appears to be of importance for both typically and atypically developing children to be able to form relationships at a younger age to help with understanding, acceptance, and inclusion as they grow. Children at a younger age approach the topic of disabilities with curiosity and a relatively positive outlook, whereas older children are more likely to focus on the challenges of life with a disability (Kayama, 2017). Essentially, young children focus on the "cans" and adolescents focus on the "cant's" This observed difference between age groups is what leads us to our research question. For this study, we want to examine how middle school students perceive those with disabilities after a simulated experience.

Poster G24 – Stefanie Neal

Mentor: Megan Adkins

Title: Preparing Teachers to Support Social and Emotional Learning for Themselves and Students

Teaching is the art of creating and inspiring all professionals (McMannis, 2018). The burdens teachers carry as they physically, cognitively and affectively attend their students, can weigh heavily enough to threaten their willingness to stay in the teaching field (Aguayo et.al. 2017). Almost half of all teachers have reported feeling burnout and within the first 5 years 40% of teachers leave the field (McManis, 2018). When teachers experience burnout, lower levels of physical, emotional, cognitive, and social health as well as self-efficacy are reported (Curry, 2012). Effective teachers are necessary in order for society to thrive. In order for teachers to be effective they need physical, emotional, cognitive, social, and organizational health to be optimized (Curry 2012). A mindfulness program which targets physical, cognitive, social, emotional and organizational health activities has been designed utilizing research regarding significant contributors which impact teachers' wellness (Aguayo et.al. 2017). Components which help foster participation will create significantly improved internal and external motivational factors increasing the overall potential for successful outcomes (Connolly, 2003). As internal and external health improves through mindfulness and health activities, the perception, motivation, management and behavioral outcomes of teachers will also improve (Curry, 2012). IHT Technology will be utilized to support significant data by allowing researchers to collect physiological data in conjunction with subjective data strengthening the quantitative components of experiment which are limited in the currently existing research database. The purpose of this study is to optimize Teachers' Wellness thereby increasing their health and decreasing the risk of burnout. Additionally, this study aims to contribute to the development of organizational health programs within schools and seeks to expand the research base available in the area of teacher's wellness (Page, 2013).

Teacher Education

Poster G25 – Katie Pfanstiel

Mentor: Martonia Gaskill

Title: Student and Teacher Perceptions of Virtual Reality and Augmented Reality Experiences

Augmented reality is defined as "a real-time direct or indirect view of a physical real-world environment that has been augmented by adding virtual computer-generated information to it" (Carmigniani et al., 2010).

The purpose of this mixed methods study was to examine the perceptions of teachers and students on virtual reality and augmented reality learning in the subject of social studies in elementary and middle school classrooms. Participants were 3-8 grade students in a rural school in central Nebraska ranging in ages from eight to fifteen years old. After a review of the literature, two research questions emerged: 1. What are teachers' perceptions and reactions on using augmented reality and virtual reality as a teaching strategy? 2. What are students' perceptions and reactions on augmented reality and virtual reality as a learning strategy in the classroom? Observations were coded and themes identified. Quantitative data was analyzed using mean scores. The study results and implications for both teaching and learning with VR are discussed in detail.

Poster G26 – Emma Sinnett

Co-Author: Alex Hinrichsen

Mentor: Jude Matayo-Cepero

Title: Is training for School Counselors sufficient for Gifted Education students?

The purpose of this research is to identify whether or not the training school counselors receive pertaining to gifted education is adequate for students whom would receive these services. This study utilizes a self-report survey administered to school counselors across the United States in regard to their professional education and training on the topic of gifted education and talented students. The researchers hypothesize that the survey will identify a greater need for training and education on the topic of best practices with talented students.

Poster G27 – Angel Spreen

Mentor: Phu Vu

Title: Exploring the Potential of Game-Based Learning in History Teaching

This study attempts to explore the use of game-based learning in the form of a low technology format of "Virtual Escape Rooms" to teach high school students how to find and analyze primary source documents for the Industrial Revolution/Imperialism, the World Wars, and the Modern World. Results of data analysis indicated that students' academic performances improved when they learned the topic presented in a gaming format. Students were engaged in the lessons and were excited to work with their peers. Detailed game description and reflections are also included for future replication.

Poster G28 – Sarah Wolf

Mentor: Phu Vu

Title: Incorporating Game-Based Learning with Shirley Jackson's "The Lottery" to Maximize Students' Achievement and Engagement

As the 21st century has witnessed a rapid rise in technology use amongst students, this study was created to explore the relationship between game-based learning (GBL) and scholastic achievement/content engagement. The online platform Kahoot served as the medium through which 40 high school sophomore English students participated in GBL during a unit over Shirley Jackson's short story "The Lottery." Academic growth was measured through a 25-question pretest and posttest, the results of which showed that students' performance increased by 244.37% across gender and ethnic groups. In addition to the quantitative data provided by the unit's formative assessments, qualitative data was gathered through teacher observation. It was observed that students' levels of curricular engagement and excitement rose as a result of GBL implementation, with these positive impacts occurring on both individual and group levels. Lessons and experiences from the study are discussed and shared in order to provide colleagues with a foundation from which they can explore GBL for future implementation in their own classrooms.

Graduate Oral Presentation Schedule

Ponderosa C

1:30 pm ..... Thomas Johnson
Definitive Interactions
Mentor – Brad Modlin

1:45 pm .....Nicole Strope
Loving of the Land: Changes the Masculinist Discourse of the American West in Willa Cathers My Antonia
Mentor – Maria O'Malley

2:00 pm ..... Danielle Williams
A Story of Gallant Bold Robin Hood
Mentor – Megan Hartman

2:15 pm .....Broc Anderson
Rural Buffalo County Communities During World War II
Mentor – Torsten Homberger

2:30 pm ..... Autumn Langemeier
Che Guevara: Unraveling the Myth
Mentor – Roger Davis

2:45 pm .....Gabriela Lopez Lemus
Push and Pull Factors of Latino High School Students: How do culturally responsive schools and social capital influence student academic achievement amongst first-generation Latino high school students?
Mentor – Michelle Warren

3:00 pm .....Rachel McGill
Assessing and Controlling Nonprofit Fraud Risk
Mentor – Laurie Swinney

3:15 pm .....Kelsey Sloup
Assessing Opportunities for Affordable Modular Container Housing in Seward County
Mentor – Ross Taylor

Ponderosa D

1:30 pm ..... Erica Brandow
The Relationship Between Nonverbal Communication and Temperament When Completing Tasks Varying on Difficulty
Mentor – Philip Lai

1:45 pm .....Jenilee Woltman
Effects of Animal-Assisted Therapy on Caregivers Working with Individuals with Dementia in Long-Term Care Facilities
Mentor – Ladan Ghazi Saidi

2:00 pm ..... Ruby Bell
Gender Affirming and Culturally Competent Healthcare
Mentor – Richard Morcarski & Sharon Obasi

2:15 pm .....Maria Diaz Guerrero
Breastfeeding Practices: Examination of Postpartum Depression and Previous Mental Health Issues
Mentor – Toni Hill

2:30 pm .....Sakiko Machida
Effectiveness of the Host Family Program for International Students' Success in the United States
Mentor – Po Hu

2:45 pm ..... Fabian Sevilla Luzuriaga
Mental Health of College Students and Academic Stress Coping
Mentor – Christine Chasek

3:00 pm ..... Stefanie Neal
The Influence of Physical Activity and Experiential Learning on Improving Memory Integration for STEM Topics
Mentor – Megan Adkins

3:15 pm ..... Luke Hamilton
Investigation of Curcumin and its Analogs as Adenosine Receptor Agonists for Treating Chronic Pain
Mentors – Surabhi Chandra & Mahesh Pattabiraman

3:30 pm .....Luke Rogers
Social Hierarchy and Feeding Behavior of Captive Wood Bison
Mentor – Dustin Ranglack

Graduate Oral Presentation Abstracts

Accounting, Finance & Economics

Rachel McGill

Mentor: Laurie Swinney

Title: Assessing and Controlling Nonprofit Fraud Risk

With technology and society advancing at a rapid pace, fraud perpetrators are finding new and clever ways to commit fraud, especially in nonprofit organizations. Although nonprofit organizations do not account for the majority of the frauds in the United States, the frauds that do occur can be devastating for most nonprofits due to their small size. Other factors increase nonprofit fraud risk such as a trusting culture and lack of director's financial expertise. The Committee of Sponsoring Organizations of the Treadway Commission (COSO) has created a framework to help all organizations to create and maintain internal controls to help achieve the organization's objectives. Risk assessment and control activities are two components of COSO's framework that are crucial to reducing fraud risk for nonprofit organizations. This paper examines each of the five components and gives examples of how a nonprofit organization can implement each component. External audits also play an important role in decreasing fraud risk for nonprofit organizations as they can give an objective opinion on the effectiveness of an organization's internal controls. A nonprofit organization can help reduce risk by completing activities such as constructing flowcharts of various business cycles as well as risk matrices to find the areas of high fraud risk. In addition, any nonprofit can implement internal controls such as segregation of duties and bank reconciliations to help prevent and detect the fraud risks.

Kelsey Sloup

Mentor: Ross Taylor

Title: Assessing Opportunities for Affordable Modular Container Housing in Seward County

Because of the high percentage of Seward County residents who commute to Lincoln for work, the city of Seward can be considered a "bedroom community". A bedroom community can be classified as a town where a significant number of residents travel outside of the city they live in for their job. Bedroom communities can be attractive because of factors such as less noise and bustle, more living space, and lower crime rates than their urban counterparts, leading to consistent population growth. Consistent population growth can create pressures on housing availability and affordability, especially for low-income, retirement-aged, and senior individuals. The population of Seward County has grown consistently over a nine-year span, which contributes to the need for new and improved housing of various forms, types, and sectors of Seward County. The Seward County Economic Development Corporation conducted a workforce housing needs survey which identified the most common barriers to housing affordability as the costs of utilities and real estate taxes, excessive housing prices, and a lack of adequate homes for sale. A proposed solution for the current problem of a lack of affordable housing in Seward County would be to test the development of modular shipping container houses in a retirement community style suitable for low-income, retirement-aged, and senior individuals. The key is that this project should start on a small scale to assess economic feasibility and that potential benefits and challenges are rigorously identified.

Biology

Luke Hamilton

Mentor: Surabhi Chandra & Mahesh Pattabiraman

Title: Investigation of Curcumin and its Analogs as Adenosine Receptor Agonists for Treating Chronic Pain

Chronic pain debilitates millions of people throughout the world. From the mid-1990s until the present, the principle pharmacologic treatment for chronic pain has been long-term administration of opioid medications. However, between 1999 and 2007, the number of deaths related to opioid drug overdose rose throughout the world and more than tripled in the USA, causing concern. In response, studies have been initiated to discover new analgesics that carry a lower risk of addiction and overdose-related death. All four adenosine receptor (AR) subtypes (A_1AR, $A_{2A}AR$, $A_{2B}AR$, A_3AR) have been investigated as targets for analgesic drugs, but concerns about cardiovascular side effects are impeding translation to the clinic. Drugs that

are selective for A_3AR offer a solution, because they inhibit pain without cardiovascular effects. Our aim is to clarify the structural characteristics of molecules that make them more selective for A_3AR over other ARs. To generate ARs for testing, three human embryonic kidney cell lines are being grown, expressing A_2A, A_{2B}, and A_3ARs respectively. We have selected curcumin as our test molecule because it has documented analgesic properties and because its binding affinity for ARs has not previously been described. We use photochemistry to alter curcumin, changing it from *trans-trans* to *cis-trans.* Both forms of curcumin are then evaluated for their binding affinity (K_i) for each of the AR subtypes using fluorescent ligand competitive binding assays. Results thus far show that isomerized curcumin binds to ARs more strongly than unmodified curcumin. Further binding assays will reveal whether isomerized curcumin is selective for A_3AR over other ARs. Further testing with cAMP ELISAs will reveal whether binding of isomerized curcumin is associated with receptor activation. Activation of A_3AR will result in depressed cAMP levels because A_3AR is coupled to G_{ai}. Activation of A_{2A}AR and A_{2B}AR will result in elevated cAMP levels, because both A_2ARs are coupled to G_{as}. In summary, the structure activity relationships discovered by this study will help future pharmacologists to design molecules that target A_3ARs for the alleviation of chronic pain.

Luke Rogers

Mentor: Dustin Ranglack

Title: Social Hierarchy and Feeding Behavior of Captive Wood Bison

The monopolization of important resources by dominant individuals is well documented for domesticated ungulates. However, the hierarchal behavior and extent of unequal access to resources has not yet been thoroughly assessed for many captive wildlife species destined for release. This is vitally important to the success of release efforts because unequal access to resources may suppress the fitness of individuals lower in the social hierarchy. We documented behavior and dominance displays in a captive population of wood bison (Bison bison athabascae) in Alaska using scan and all occurrence sampling methods. We determined that this population maintained a stable linear hierarchy, and that there was unequal access to concentrated food resources during winter months, especially among juvenile bison. Limited access to food may have contributed to the compromised health of a young individual. Our findings may help captive wildlife managers optimize the conditions needed to maintain health and fitness of individuals destined for release into the wild.

Communication

Ruby Bell

Mentors: Richard Morcarski & Sharon Obasi

Title: Gender Affirming and Culturally Competent Healthcare

Background: Transgender and Gender Diverse people are a minority group of people in the society who face a lot of challenges in several areas of their lives. This project assesses the educational preparedness of healthcare professionals to provide culturally competent healthcare. Though the need for healthcare is in high demand in this population, there is a lack of specialized gender affirming providers available for the TGD population. Furthermore, due to inadequate affirmative healthcare, TGD individuals may face stigma even in their search for a provider, particularly those TGD people living in States without legal protections (Holt, Hope, Mocarski & Woodruff, 2018).

Methods: Educational preparedness to provide gender affirming and culturally competent healthcare was assessed using a Qualtrics survey.

Results: Thus far 80 participants have completed the survey including 49 students and 31 professionals. Preliminary analysis revealed that among the student participants 63% were not familiar with the term gender-affirming care. In contrast, 71% of student participants were familiar with the term culturally competent care. Similar observations were made among the professionals who participated in this study. Other planned data analyses include the assessment of gender differences in familiarity with the terms gender affirming and culturally competent care and a qualitative analysis of participants' suggestions regarding the offering of gender- affirming and culturally competent training during healthcare training. This project serves to inform best practices regarding the training of healthcare professionals on topics such as gender-affirming and culturally competent care.

Conclusion: Results from survey are currently being assessed since the project is still in progress and conclusions have not been made yet.

Communication Disorders

Erica Brandow

Mentor: Philip Lai

Title: The Relationship Between Nonverbal Communication and Temperament When Completing Tasks Varying on Difficulty

A study by the National Aeronautics and Space Administration (NASA) found when communication delays occur, it impacted the outcomes of teamwork relationships and tasks, causing frustration and anxiety among team members (Kintza, Choub, & Ves, 2016). Still, there is little research that evaluates nonverbal communication and how these modalities affect teamwork dynamics. Thus study

investigated the relationship between self-perceived self-esteem, temperament, sociability, and nonverbal behaviors such as eye contact, gestures, and facial expressions with respect to assigned tasks that vary in level of difficulty. A secondary goal investigated the relationship between duration and frequency of eye contact based on varying degrees of task difficulty. Data from eighteen adults divided into six groups of three were used in this study. Self-perceived self-esteem, temperament, and sociability were assessed through the Rosenberg Self-Esteem Scale, Adult Temperament Questionnaire, and Salk Institute Sociability Questionnaire. Varying task difficulty was measured by the total amount of time it took to complete a given assignment by the experimenters before the study began. Non-verbal behaviors were analyzed through the coding system Eudico Linguistic Annotator (ELAN) recorded from individual interview about completed teamwork tasks. Results between self-perceived temperament and gestures suggested a trending relationship between individuals with a higher positive temperament and producing more gestures during interviews. It was also found that participants produced eye contact more frequently when being interviewed compared to facial expressions and gestures.

Jenilee Woltman

Mentor: Ladan Ghazi Saidi

Title: Effects of Animal-Assisted Therapy on Caregivers Working with Individuals with Dementia in Long-Term Care Facilities

Dementia is becoming more prevalent in our society. Most individuals with dementia (IwD) reside at long-term facilities. Dementia symptoms such as agitation and decreased communication can burden caregivers at the facilities (Gitlin et.al., 2008). Health professionals need to consider alternative therapies that can decrease agitation, increase communication and facilitate interactions between IwD and their caregivers.

The goal of this research project is to see if animal-assisted therapy (AAT) with IwD can diminish stress and increase job satisfaction in caregivers at long-term facilities. We hypothesis that AAT results in lower agitation, increased verbal communication and increased health status in IwD. This can facilitate IwD-caregivers interaction and therefore decrease the caregivers' work related stress and increase their job satisfaction.

This study takes place in rural Nebraska at a long-term facility. The caregivers participating in this study will directly work with 20 IwD with agitation problems. The IwD will attend eight sessions of cognitive stimulation and evaluation. In four sessions, a dog is present (AAT sessions) and in four sessions, the dog is absent (the control condition). The caregivers working with IwD receiving AAT will be asked to fill-out a job satisfaction survey: The Job Descriptive Index and a survey to measure stress: The Stress in General Scale after each session and 24h after each session.

We will compare the results of the surveys The Job Descriptive Index and The Stress in General Scale for the AAT sessions verses the control sessions. We will discuss the results in the context of cognitive communication therapies that are cost effective, pragmatic and easy to implement.

Counseling and School Psychology

Maria Diaz Guerrero

Mentor: Toni Hill

Title: Breastfeeding Practices: Examination of Postpartum Depression and Previous Mental Health Issues

The purpose of this presentation is to examine the relationship between maternal depression and breastfeeding. Postpartum depression (PPD) is a major depressive disorder that is often misdiagnosed and interchanged with minor depression or the baby blues. Approximately, 7.1% of new mothers have major depression in the first three months. (Beck, 2006). This is an important topic because depression after childbirth is more common than many think and it does not receive the attention it deserves. Furthermore, lactation services are important to the breastfeeding process and the occurrence of PPD. Breastfeeding during pregnancy affects depressive symptoms if the mother does not fulfill her intention after childbirth (Borra, Lacovou, & Sevilla, 2015). The lack of public education related to breastfeeding and depression leads to misdiagnosed and untreated major depression disorders such as PPD which can be dangerous for both mother and baby. Women may suffer from PPD without knowing it or they may think that it is normal. Thus, it is paramount to raise awareness to recognize the symptoms of PPD. Moreover, the history of mental disorders in pregnant women might play a role in developing PPD. Also, the fact that some women were not breastfed can contribute to the reluctance to breastfeed their babies. Counseling and therapy are great alternatives to treat women with PPD especially if they are unable to take medication. The combination of both therapy and medication is a viable option and collaboration with primary physician, lactation consultant, and a mental health practitioner maybe the best response.

Fabian Sevilla Luzuriaga

Mentor: Christine Chasek

Title: Mental Health of College Students and Academic Stress Coping

A survey and scales were given to all undergrad college students (1066) from the *Pontific Catholic University of Ecuador – Ambato*, from which a sample of 287 students was gathered in a three-month period. The purpose was to determine the relationship between the presence of psychological distress/symptoms and the use of academic stress coping skills like positive reevaluation, support seeking, and planning. A small effect size significant correlation ($r=.134$, $p=.023$, $r^2=.017$) was found between psychological distress/symptoms and support seeking. Also, a positive correlation among the three coping skills was found, which suggests that they trigger each other significantly.

Sakiko Machida

Mentor: Po Hu

Title: Effectiveness of the Host Family Program for International Students' Success in the United States

While the number of the international students in the United States (U.S.) increases, they tend to face difficulty in adjusting to a new environment in the US. In order to enhance the quality of their studies and success in their academics and social life in the U.S., Trice (2004) showed that it is critical for international students to feel connected to the community. Also, some argued that social connectedness among international students is significantly related to their communication skills (Rosethal, Russell, & Thomson, 2007). Recognizing the importance of being connected to the community, this study will explore the relationship between international students' experience with their host family and their perceived success in their academics and social life while in the United States. We hypothesized that more quality interactions students have with their host family, more perceived success in the students' academic and social life. We plan to conduct a survey among international students at the University of Nebraska-Kearney (UNK) regarding their experience of host family program, their academics and social life. Findings from this study will be useful in improving international students' experience, enhancing international student's retention rate, and further ensuring international students' success in their academics and social life in the United States.

English

Thomas Johnson

Mentor: Brad Modlin

Title: Definitive Interactions

A collection of recently composed poetry, including the three pieces the author will be presenting at the Sigma Tau Delta Convention in Las Vegas. Empathy and human interaction are common threads.

Nicole Strope

Mentor: Maria O'Malley

Title: Loving of the Land: Changes the Masculinist Discourse of the American West in Willa Cathers My Antonia

This paper argues that Willa Cather's novel *My Anotonia* (1918) complicates dominant narratives about the settlement of the American West. While most conceptions of the American West reinforce masculinist discourses of men dominating the settlement of the frontier, Cather demonstrates women's true roles of the taming of the frontier. Drawing upon theories of Annette Kolody, Shoba and Nagaraj, and Georgi-Findlay, I demonstrate how Cather allows us to reimagine not only women's place on the frontier but also how it was tamed by women writings.

Danielle Williams

Mentor: Megan Hartman

Title: A Story of Gallant Bold Robin Hood

When considering the character of Robin Hood and the vast amount of medieval literature surrounding him, often scholars try to answer the large cultural questions like "who was Robin Hood?" or "why has his story survived so prominently in modern culture?" Many scholars, including those trying to answer a question like the ones above, focus on the similarities between the many different ballads, tales, and plays that feature Robin Hood. This then leads to less attention being paid to the differences between the early and late works. While these variations are somewhat subtle and not as noticeable as the consistencies, they offer valuable insight as to how the tale of Robin Hood has survived in popular culture throughout centuries.

This paper will examine the character of Robin Hood and how one common trait of his, frivolity, plays an important role in understanding him in his well-known role as an outlaw hero. By looking at how Robin Hood is portrayed in the first extant ballad, the only complete early ballad, and two later ballads that illustrate a key change in Robin Hood's behavior, it becomes clear that the extent of his flippant attitude gives way to the type of more serious attributes that are often considered heroic. Although some aspect of silliness has always played a role in Robin Hood's personality, between the afore mentioned stories, Robin Hood changes from an un-caring and frivolous mischief maker to someone easily recognizable as a hero.

History

Broc Anderson
Mentor: Torsten Homberger
Title: Rural Buffalo County Communities During World War II

Serving one's country through military service is only one way many Americans found their place during World War II, but for many civilians, promoting patriotism in schools, at town halls, or other social gatherings could help get Americans behind winning the war. Examples related more specifically to Nebraska include local efforts to boost morale among soldiers at the North Platte Canteen or the introduction of various military production facilities in Kearney, Hastings, and Grand Island. While these larger communities are ideal for their geographic location and sustainable population, more rural communities in Buffalo County found that their crucial role for the war umbrellaed underneath these larger cities in Nebraska. Communities such as Ravenna, Shelton, Gibbon, Elm Creek, and Pleasanton were heavily relied upon for their production of agricultural goods, while also extending their patriotic support through larger pro-war enterprises.

Autumn Langemeier
Mentor: Roger Davis
Title: Che Guevara: Unraveling the Myth

Using the revolutionary leader from Latin America's past, this paper examines the changing opinions of researchers throughout the decades following Guevara's death and into the present. It also examines how different interests in historical research are seen in these developing perspectives and changing ideas. Special attention is given to the consideration of historical memory in relation to Guevara, as well as the role of iconography in modern historical memory.

Kinesiology & Sports Sciences

Stefanie Neal
Co-Author: Brady Roeder
Mentor: Megan Adkins
Title: The Influence of Physical Activity and Experiential Learning on Improving Memory Integration for STEM Topics

Despite advancements in technology, children's physical, social and cognitive health are at risk more than any time in American history (McGee, 2018). Play which is essential for healthy development in children, has de-evolved from enriched social, sensory, and motor experiences, to isolated, sedentary, two-dimensional experiences causing interest and motivation to rapidly decline (Essame, 2020). Technology dominated play threatens the cognitive, social, emotional and physical development and health of our children (McGee, 2018). Strangely, as technology advances, Science, Technology, Engineering and Mathematics career field selections have declined by such a rapid pace that an alarm has rung throughout industries across the nation (Egenrieder, 2010). To combat this alternative K-12 STEM programing has begun to be developed by many public institutions with the intent to create interest and motivation for learning STEM (Hodges et al 2018). The motivation to learn new information is increased exponentially through consistent, sensory and motor rich experiences (Honeycut Sigler & Tyran, 2017 check). Consistent experiences are required for the brain to assign meaning to the newly integrated information and the efficiency of this skyrockets when learners are in motion (Pino Juste, Portela Pino & Abalde-Amoedo, 2016). NE STEM 4U UNK PE integrates experiential and sensory rich learning strategies and combines them with strategically designed physical activities which incorporate specific STEM Concepts. This program aims to enhance physical, social and cognitive health of children by combining factors which intrinsically motivate play and exploration of STEM Concepts in an After School Program.

Modern Languages

Gabriela Lopez Lemus
Mentor: Michelle Warren
Title: Push and Pull Factors of Latino High School Students: How do culturally responsive schools and social capital influence student academic achievement amongst first-generation Latino high school students?

The heavy flow of migration to the United States from Latin American countries is not stopping. Latinos of all ages are continuously integrated to American classrooms. Eventually, these students will have to graduate high school and establish a post-secondary plan. Some schools are ill prepared for the rising demographic while others are culturally responsive. It is important to recognize Latinos have the highest high school dropout rate and analyze current methods of how schools respond to minority groups, specifically, Latino students. The purpose of the paper will identify what influences Latino students' academic success. The study will analyze the success of established programs in inner-city schools and what conversations parents and students are having about higher education. The study examines how effective educators, college-bound established programs, and parents all have an overwhelming influence on the students' academic achievement, defeating the cultural and attitudinal barrier. Results show that not only are high school graduation rates increasing among the minority group, but also more Latino students are enrolling in higher education institutions. This study proposes an approach for Midwestern, rural-cluster schools that seek a exemplary plan to become culturally responsive towards rising the demographic of their schools using urban schools as resourceful data.

Undergraduate Poster Abstracts

Fine Arts & Humanities

Communication

Poster U01 – Madison Reiber

Mentor: Sonja Bickford

Title: Understanding Appeals in Target Advertising: The Motive & Interest Behind Advertising

The aim of this study is to gain a better understanding of why people are drawn to certain advertisements and not others. Many of the major advertising agencies are located on the coasts of the United States, near New York City and Los Angeles. However, "92% of the US population lives outside of the 10 largest cities in America" (Largest Cities, n.d). The research behind advertising is always ongoing as marketers and designers seek to send messages to their target audiences. However, as society and people change advertisers seek to keep in touch with really understanding the US population. Major advertising agencies are making their advertisements to cater to the 8% of the population that live in their local area, while never really taking the time to understand the 92%.

With the evolution of technology and applications, there are so many platforms and new ways for advertisers and marketers to reach their target audience. It goes beyond just trying to place your message in front of the general public. Instead, it has to do with staying up to speed with what is going on in the modern consumer's mind. What are people thinking and what gets their attention? Thus, an advertiser or creative strives to understand how the consumer thinks, feels, what they like, dislike, what their values are, where they spend their time, what gets their attention, how certain imagery makes them feel, and much more.

Through this study, various target demographics with a common interest is surveyed to ask and better understand people of various, backgrounds, ethnicities, genders, socioeconomic status, education, and regions what they think is the more appealing along with what media they would prefer to find useful advertisements. Demographic and geographic target audiences were selected based on their expressed interest in a common topic of aquaponics or leadership. The results of the study will provide those interested in advertising an idea of what appeals to people from different demographic and geographic groups but who share a similar interest. For example, the advertising preferences are compared between executives, training managers, non-profit members, employees of for-profit companies, government groups, and students. The results will provide insight into the preferences and minds of the modern consumer interested in aquaponics or food sustainability and / or leadership in the evolving workforce.

English

Poster U02 – Rachel Hollenbeck

Mentor: Amanda Sladek

Title: The Successful Rhetoric of World War II

The leaders of World War II are known for their successful rhetoric. Through their rhetoric, World War II leaders influenced their people to fight and keep fighting, even in the darkest days of the war. For this project, I have chosen six successful leaders in the European Theater of World War II: Winston Churchill of Britain, Franklin Delano Roosevelt of the United States, Charles de Gaulle of France, Joseph Stalin of the Soviet Union, Benito Mussolini of Italy, and Adolf Hitler of Nazi Germany. From each of these men, I have chosen two speeches to analyze: one from the earlier part of the war, and one from the later days of their leadership in the war. The analysis I have chosen is based on the ideas of Lloyd F. Bitzer in "The Rhetorical Analysis." In this article, Bitzer argues that rhetorical discourse (such as a speech) requires a rhetorical situation (a situation that invites a response). My analysis will start with a study of the situation and context that preceded and surrounded each speech then move into the speech itself to see how the response was fitting. A fitting response means that the speech is tailored to the audience and meets the audience's expectations concerning the subject and style. Through this methodology, I will analyze what the situation required of rhetoric and how each leader delivered what was needed to his audience. My goal at the end of this process is to reveal what made these men successful rhetoricians.

Modern Languages

Poster U03 – John Stuart

Mentor: Ronald Wirtz

Title: Investigating Perceptions of DACA in Nebraska

The purpose of my research is to explore the attitudes on immigration amongst UNK students. It is important because there are hundreds of students here at UNK that are either DACA or first generation immigrants

to the country. Opening up the minds of everyone on campus to this complex, polarized issue in a friendly and unbiased way can help us come to a better understanding of each other. My methodology will be a survey, in-class, from various sections of UNK and UNMC Kearney campuses. The survey will be a broad, confidential, look at immigration attitudes that is easily interpreted.

Music, Theatre, & Dance

Poster U04 – Terran Homburg

Mentor: Sharon Campbell

Title: The Goddess Isis in Song

The Goddess Isis in Song began as an Undergraduate Research Fellowship devoted to exploring the connections between three cultures' religious beliefs (the ancient Egyptians, the ancient Grecians, and the medieval Norse) and their traditional music. Beginning my research, I became engrossed in the cyclic timeline of Egyptian myth and observed one goddess possessing ties to most events central to Egyptian belief: Isis.

After this realization, I narrowed my focus to the goddess Isis and her evolution throughout Egyptian myth. In Isis, I found a woman who has played many roles in her character's arc. She has been portrayed as a mere human, a devout wife, a mother to god and kings, a fierce warrior bent on revenge, and finally the all-powerful supreme sorceress and creator goddess. Upon further reflection, I found Isis' evolution to be a lens through which I could view and reflect on the role of women throughout history.

In the Egyptian mythical canon, Isis is the mother of music. As such, a song cycle pays tribute to an intrinsic aspect of her character. *The Goddess Isis in Song* is now evolving into a multi-movement work inspired by the myth and lore surrounding Isis, utilizing existing texts and original poetry set to my own compositions. *The Goddess Isis in Song* will be presented as an original staged work in the 2020-21 academic year, utilizing the different colors and timbres of the female voice to tell the story of the goddess Isis.

Poster U05 – Zachary Petry

Mentor: Del DeLorm

Title: Analyzing the Greek Chorus and Its Influence on Modern Media

The Greek chorus was an essential part of Greek theatre that served as the origin of modern drama. Choruses were versatile in that in each play they served the same purpose but took shape in various forms. This research project focuses on the function of the chorus, its influence in modern media, and the future trajectory of the chorus. Only tragic works by three playwrights exist: Aeschylus, Euripides, and Sophocles. Euripides' choruses tended to act as bystanders and commentators on the action of the play while Sophocles' choruses furthered the plot and were considered a character within the action of the play. Both of those models are still followed in media today. In musical ensembles, the ensemble characters interject and continue the story and narrators in movies simply act as a bystander explaining the action. Choruses will certainly continue to follow these established models. However, these models are also likely to intermix with each other and will develop the chorus further.

Poster U06 – Sydney Wilson

Mentor: Anthony Donofrio

Title: The Blue and the Gold: Arranging the University of Nebraska at Kearney Alma Mater for Four-Part a Capella Voice

The Blue and the Gold: Arranging the University of Nebraska at Kearney Alma Mater for Four-Part a Capella Voice is an Undergraduate Research Fellowship dedicated to creating an updated edition of the UNK Alma Mater Song for four-part choir that will be accessible to students at the University, especially those in the Pride of the Plains Marching Band and choral ensembles. The project utilizes the original text from the 1915 *Blue and Gold Yearbook.*

I wanted to create a version that was true to the original text, paid homage to the Irish origin of the melody, and updated the harmonies to reflect the version that the Pride of the Plains Marching Band performs during their pregame sequence at Loper home football games. In order to accomplish this task, I collected all cataloged versions, whether or not they were currently in use, and analyzed their settings of the melody and harmonic structures. I also built upon my knowledge of traditional Irish harmonies and the origin of the melody as a folk tune.

Through this information, I have begun arranging a new edition of this university song. The arrangement will be shown to the UNK Choraleers and UNK voice faculty for feedback to ensure all parts are approachable to music majors, non-music majors, vocalists, and non-vocal primaries. *The Blue and the Gold* aims to create an arrangement that can be performed by various campus ensembles in the Fall of 2020.

Behavioral & Social Sciences

Geography

Poster U07 – Humberto Anrade-Goeken

Mentor: Jason Combs

Title: The average CO2 output for the lower 48 States and the District of Columbia by vehicle miles traveled

This project examines the average vehicle CO_2 output in each of the lower 48 states and the District of Columbia. This is done by using the VMT (vehicle-miles traveled) for each region and comparing them with the average CO_2 grams per mile. All vehicle types are grouped together and averaged to create a standard average CO_2 emission per vehicle. This will determine which states have the greatest or least amount of deviation from the national average CO_2 emissions. The data shows that the southern and rural regions have a much larger output compared to highly populated states with larger more densely populated cities and suburbs.

Poster U08 – Tariro Chinhamo

Mentor: Jason Combs

Title: The Development of Classical Music

This paper researches the Classical music period, which was a period during the 18th and early 19th century (1750-1820). There are several notable composers from this time period, most of which are still known presently. These "greats" include the likes of Wolfgang Amadeus Mozart, Joseph Haydn, Johann Sebastian Bach, and Ludwig Van Beethoven to name but only a few. Much unlike modern day artists, classical composers have many more works to their credit. Haydn, for instance, has 100 symphonies and more than 300 other works to his name. It is safe to say that this era of music originated in Europe as all major composers were from European countries, but their music has now spread worldwide. Recordings of classical music compositions are still popular today, whether it is the background music of a movie scene, an elevator, or mere commercials. In the United States alone there are approximately 190 classical music radio stations which further proves that it is still important in modern-day.

Poster U09 – Austin Glause

Mentor: Paul Burger

Title: A Retail Gravity Model Estimation of Running Equipment Demand in Nebraska Using GIScience

The purpose of this research is to identify a location in the state of Nebraska that draws enough demand to warrant the placement of a new running equipment store. Specifically, this research is intended to determine which of two communities, Sidney or Valentine, selected through a location-allocation has enough demand with the least amount of competition for a new store with sufficient market share to make it profitable. GIScience is used as the framework for the analysis of factors contributing to the location and viability of a new running equipment store. US Census Bureau TIGER / Line files provide the foundation for the spatial database including the following geographic layers: block groups, city, county, and state boundaries in addition to road networks. Socio-demographic variables at the block group level and existing running equipment stores are acquired from ArcGIS Business Analyst.

Given the proposed locations of Sidney and Valentine along with existing competitors, the goal is to determine which location will be more suitable based on the number of customers that will choose that site. The *Huff Model* in ArcGIS is a probabilistic gravity model used to predict consumer behavior by estimating the portion of demand (customers) choosing a selected site from among competing locations. Demand surrounding these two sites are selected from a related project through the location-allocation heuristics of Maximize Market Share (MMS) and Maximize Attendance (MA); analyzed using the Huff Model. The results provide a suitable location to create a new running equipment store in the state of Nebraska.

Poster U10 – Rene Ingersoll

Mentor: Jason Combs

Title: Analysis of Population and Economic Growth in Central Nebraska

Many new businesses have recently opened their doors in Kearney. The former K-Mart and Herberger's buildings have gone through major renovations to accommodate up to four businesses, also south of town on the old Best Western lot, renovations for new restaurants have started. Many new businesses are arriving, yet is this increasing Kearney's economy and population? It is clear to see that Kearney is growing in size as apartment buildings are rising on 56th Street, but how does it compare to surrounding communities? In this study I examined various towns of similar size and situation in Nebraska to compare population and economic growth from 2010-2020. The analysis is based on information provided by the U.S. Census and Chamber of Commerce for each city.

Poster U11 – Justin Vrooman

Mentor: Paul Burger

Title: If They Run, They Need Running Shoes: Using GIScience Locate-Allocate Models to determine the Location of a Running Shoe Store in Nebraska

Nebraska Running Emporium (NRE) hopes to identify a location in Nebraska where demand would be sufficient to open a new running shoe store. An ideal location for NRE has sufficient consumer demand with the least amount of competition within the market area.

GIScience is the framework for analyzing the factors impacting the location of a new running shoe store in Nebraska. US Census Bureau TIGER / Line 2019 files provide the foundation for the spatial database including the following geographic layers: block groups, city, county, and state boundaries in addition to road networks. Socio-demographic variables at the block group level and existing store locations are acquired from ArcGIS's Business Analyst.

Using the data obtained from the US Census Bureau TIGER / Line 2019 files and ArcGIS's Business Analyst, the goal is to determine a location in Nebraska where the store could be profitable. Locate-allocate (LA) identifies a new store location from among multiple candidates based upon the interaction among the candidate locations, competitors and demand points. It does this by balancing supply (existing stores) with demand (desire for equipment) across a geometric network (roads) based upon constraints (distance people will travel for equipment). Using the location-allocation heuristics of Maximize Market Share (MMS) and Maximize Attendance (MA), two sites were selected. The two sites that resulted from the location allocation heuristics will allow NRE to determine which site will be most profitable and therefore where to locate their store.

Poster U12 – Marshall York

Mentor: Jason Combs

Title: Glacial Extent During the Pleistocene Ice Age

In this paper I am going to share my research about the extent of glaciers in North America during the so-called Pleistocene Ice Age that occurred from 1.8 million to approximately 10,000 years ago. I will also cover maximum glaciation, sea level changes, and what the landscape was like before and after maximum glaciation. Lastly, I will share information regarding deposits that remain—the furthest extent, for example, was into modern-day northeastern Kansas. As the glacier receded whole ecosystems and landscapes changed.

Political Science

Poster U13 – Reyna Auyon-Escobar

Mentor: Satoshi Machida

Title: The questions at the Heart of America

The main focus of this study was to identify the questions the American people wanted to be answered by the upcoming candidates for the 2020 elections. For this study, the focus was more on qualitative research with quantitative support. Not only did I want to address what Americans wanted to be answered by candidates but explore the influences influencing the candidates, for example; lobbyists, donors, but also the distinct differences in race, education, and political party drives. This then gave way to instances of economic, societal, and international questions that lend themselves to the overall issues facing the United States. The questions and concerns identified in this study are just a snapshot of the political climate of the last three years and the next presidential term.

Poster U14 – Megan Cook

Mentor: Peter Longo

Title: The Politics and Policy of Pay to Play: The Case of Nebraska

The debate over whether college athletes should be paid to play sports has become a salient issue recently, especially in Nebraska. Although college athletes have not been paid in the past, many believe that change needs to occur. Nebraska LEGISLATIVE BILL 962 addresses athlete compensation. Nebraska is also examining other issues with the NCAA, such as rules on the transfer portal. I will be examining the value of a college education, how to balance an individual situation with the greater good, and how the Nebraska legislative pay proposals have an impact on the student athlete and campus life.

Poster U15 – Adrian Gomez Ramos

Mentor: Peter Longo

Title: Rural Resiliency: Prescribing Potential Paths to Expand Access to Mental Health Care in Rural Nebraska

The floods of March and July of 2019 were devastating natural disasters that impacted the lives of countless Nebraskans. Rapid changes in temperature after Winter Storm Ulmer caused the accumulated ice and snow on major river systems to thaw at accelerated rates, creating fears of the inevitable. Though the floods affected numerous Nebraskans, rural communities were especially vulnerable to the unforeseen consequences. Rural communities experienced devastation in the form of destroyed agricultural equipment, ravaged farmland, lost livestock, and in some cases, the tragic loss of life. Problems did not subside for rural residents, as economic turmoil visited the families of those hit hardest by the floods. Another unforeseen and often ignored problem was revealed once the waters receded: mental health illnesses. Distress in the wake of the floods developed into illnesses like depression, anxiety, and post-traumatic stress disorder. Even before the floods, the need for mental health services in rural communities was present. Given that the recent floods have exacerbated mental health illnesses as a result of great personal and economic loss, action must be taken to address the issue of access to mental health care in rural Nebraska.

Poster U16 – Nicole Kent

Mentors: Peter Longo & Satoshi Michida

Title: A Comparative Study of Healthcare Costs and Quality in Rural United States and Japan

In the United States and in Japan, rural populations face numerous disparities in obtaining healthcare when compared to urban peoples. As twenty percent of Americans and ten percent of Japanese live in rural areas, both countries have significant rural populations and experience shortages of physicians in rural areas. In the United States, the cost of comparable healthcare procedures and visits is higher in rural facilities compared to urban hospitals. Based on the percentage of the population that is uninsured and the Index of Relative Rurality as a composite measure of rural-urban status, we discover a clear relationship between rurality and rates of uninsured peoples. This issue is only compounded by the shortage of rural healthcare providers and the increased cost of healthcare in rural facilities. In Japan, costs of healthcare services are regulated by the government, and all citizens have governmental health insurance. We seek to understand the relationship between Japan's universal healthcare system with reference to the quality of rural healthcare provided and healthcare costs and how these outcomes vary with the United States' hybrid healthcare system. We will compare and contrast the way healthcare is provided and paid for in the two advanced industrialized systems.

Poster U17 – Noah Pierson

Mentor: Satoshi Michida

Title: Balancing vs Bandwaggoing: Institutional differences between Asia and Western Europe

Western Europe and Asia rely on and invest in institutions differently and thus have key differences in their overall security. Observing what key differences allow for strength of the EU but difficulties for the ASEAN can help to understand how to bring about stability to a region. The role that Southeast Asia plays in balancing against China starkly contrasts the bandwagon approach of Europe for key reason. Part of these reasons could be the homogeneity of Europe versus the diverse nature of Europe. Another explanation could be the structural problems with the ASEAN. Understanding some of these differences might help to bring about stability and can help to provide security surrounding Chinas growing strength in Asia.

Poster U18 – Parker Witthuhn

Mentor: Peter Longo

Title: The Right to Privacy in 2020: From Foundation to Dystopia

A law review article written in 1890 at the advent of instant photography, years-worth of warrantless location tracking data, the use of instant facial recognition and identification technology, and a multibillion-dollar tech industry; What do they have in common? They all involve your constitutional right to privacy. This presentation will explore the theoretical foundations, jurisprudential developments, and current state of privacy protections in the year 2020. Beginning with the famous December 1890 *Harvard Law Review* article entitled "The Right to Privacy" written by a future Supreme Court Justice Louis Brandeis and his fellow scholar Samuel Warren, this poster will dive into a realm of US legal theory, jurisprudential history, and digital age controversy that will attempt to show what privacy rights Americans have and why their protections now fall short. The story of privacy rights in the United States is long, complicated, and fascinating, but is one that most Americans do not fully understand. Legal theory, common law, jurisprudence, and the constant march of technological progress have all molded privacy rights in the US, but with the digital explosion of the last 30 years these rights are strained more than ever before. This project will attempt to use those historic foundations to chart a new path forward for the right to privacy in the digital age.

Psychology

Poster U19 – Cy Cannon

Mentor: Bill Wozniak

Title: Evaluation of the Moth Effect: Myth or Valid Psychological Phenomenon

Drivers face a multitude of distractions while behind the wheel. Several are quite common and apparent; however, one in particular, dubbed the Moth Effect, is shrouded in mystery. The Moth Effect is best described as the tendency for a driver to fixate on a flashing light, inadvertently steer toward the source of said flashing light, and possibly cause a collision. The popular press and even law enforcement attribute it as the cause for collisions with state patrol vehicles with their take-down lights on (flashing lights). These claims, however, are not backed up by reliable science. Empirical evidence regarding the Moth Effect is extremely limited overall, begging the question: Is the Moth Effect a valid psychological phenomenon impacting transportation safety, or is it simply a myth that lives on via anecdotal references? A series of experiments were conducted to further examine the validity of the Moth Effect. By comparing data across several studies, more light has been shed on this subject. What conditions may or may not increase the likelihood of the Moth Effect being present will be addressed, in addition to the overall validity of the effect itself.

Poster U20 – Jose Francisco-Andres

Mentors: Christopher Waples

Title: Exploring Factors Influencing Member Commitment in Fraternities and Sororities

Recent national trends suggest that membership in Greek social organizations is declining (Snyder 2019; Schmelzer, 2019).The following study investigated different factors that influence organizational commitment (OC) of current members or those undergoing the new member process of a Greek social fraternity or sorority at the University of Nebraska at Kearney (UNK). OC refers to a person's ongoing interest in remaining with an organization. This study utilized a three-component model for OC, which consists of affective commitment (emotional ties to an organization), normative commitment (perceived obligation to an organization), and continuance commitment (perceived cost of leaving an organization). Although OC is traditionally applied to work organizations, this study applied it to on-campus Greek social organizations given their similar characteristics. Participants for this study were solicited by their respective chapter executive boards. Participants were asked questions regarding their experience at UNK and with their respective chapters, their degree of individualism/collectivism, their degree of brotherhood or sisterhood, family support, sense of social support, financial status, GPA, and demographics. Each of these factors were examined using Multiple Regression models to gain better insight on how they affect certain components of OC. Factors promoting OC offer UNK Greek social organizations specific areas of focus to maximize commitment from their members. Results and implications of the study will be discussed.

Poster U21 – Andrew Fritson

Mentors: Julie Lanz & Krista Fritson

Title: The Effects of Mindful Meditation Using a Mobile App in Law Enforcement Officers and Their Romantic Partners

Recent studies have found that mindful meditation interventions have a positive effect on many aspects of people's lives. One of those aspects is burnout in the workplace. Burnout is prevalent in the public/human services - especially law enforcement officers (LEOs). When people experience burnout, their quality of work declines as well as their satisfaction. Mindfulness interventions can be helpful in combating burnout and improving the resilience in those affected by it. Resilience is a key component in how someone is affected by stressful events as well as their ability to overcome it. This study explores the role that mindful meditation has on decreasing burnout and increasing resilience. Participants were placed into one of two groups (LEOs and their romantic partners (RPs), $N = 45$) or LEOs without an RP ($N = 12$). Evidence has shown that if both individuals in a relationship participate in the intervention, the success of it is greater. Participants completed pre- and post-surveys as well as weekly surveys over an 8-week period. During this time, they were instructed to use the *Smiling Minds* smart phone application. The findings of this study may be helpful in the development of mental health training and services for LEOs and their RPs.

Social Work

Poster U22 – Samiya Alexander

Mentor: Toni Hill

Title: HBCU vs PWI Leadership Opportunities

For my research project, I am going to be researching collegiate student leadership issues including the existence of leadership opportunities, and mentorship for students of color. I will compare the leadership issues across Predominately White Institutions (PWIs) and Historically Black Colleges and Universities (HBCUs). Initially I will compare existing documentation across PWIs and HBCUs related to leadership developing a cross-institutional comparison on specific areas (e.g., mentorship programs targeting students of color at both PWIs and HBCUs, identifies the need for students of color to be connected to positive peers and supportive faculty on campus to be successful (Goings, 2016)). I will also complete a literature review of issues for students of color engaged in leadership at the college level. By conducting and analyzing this research, I hope to increase the awareness of the needs of students of color in leadership opportunities for students of color to feel like they belong and can benefit from leadership opportunities on campus in hopes to retain students of color.

Poster U23 – LillyAnn Cavill

Mentor: Taekyung Park

Title: Field Students Self Care through Deep Breathing

Social workers are exposed to direct and indirect trauma. Social work field students are no exception. However, there is a lack of research on self-care among social work students let alone field students. This project employs deep breathing as a self-care technique to help field students manage stress and keep their compassion satisfaction.

Poster U24 – Diel Dumas

Mentor: Benjamin Malczyk

Title: Affective Teaching in Social Work

Affective teaching is a topic that is mentioned and hinted at in course syllabi, handbooks on teaching and other similar resources. However, the research on affective teaching compared to more technical instruction is not as abundant or well known. This study seeks to identify current research in this area as well as to determine and carry out a short research project examining affective teaching.

Poster U25 – Emily Freske

Mentor: Benjamin Malczyk

Title: Assessment of Latino Needs

Due to the changing demographics in Nebraska, Latino serving agencies are becoming more important. As the Latino population increases, it is becoming more critical to provide resources needed in order for the population to meet basic human needs. This research will show how Latino immigrants in Nebraska would benefit from additional services that could be provided by creating coalitions between Latino serving agencies. Services might be better supplied to Latino immigrants if Latino supporting agencies were able to collaborate in order to combine knowledge and resources. The research identifies existing agencies in Nebraska that specifically serve the Latino population. Data for the research was collected through internet searches and directly contacting known agencies to identify additional Latino serving institutions. The information gained about these institutions has been recorded in a database and it is planned to utilize such information to build future collaborations and networks of Latino serving agencies. Ultimately, the research seeks to assigned agencies in their ability to do more to serve Nebraska and Latino populations.

Sociology

Poster U26 – Dina Lado Andrea

Mentor: Sandra Loughrin

Title: How the myth is reinforced: Exploring the Depiction of Black Women in Different Components of the Media Compared to Historical Tropes

The purpose of this analysis is to explore how black women are depicted in the media and analyze if there is a link between the current depiction of women and historical tropes. Black women are often subjected to stereotypes that control, oppress, and marginalize them. Most of the stereotypes that black women endure derive from the multiple roles they adopted due to their history of slavery, segregation, and limited access to resources. Society has forced black women to live in a space that is not completely feminine nor masculine. This ambiguous gendered role has also played a role in the construction of stereotypes. Black women are also perceived by society and behave in ways consistent to the stereotypes. Unfortunately, these stereotypes are also associated with health consequences including negative emotional and psychological effects. This analysis examines articles related to different components of the media which include sports, music, and television/movie industry. Ten articles for each media component will be examined and interpreted based on its depiction of black women. The articles will be coded based on newfound common themes and occurrence of attributes related to historical tropes. The goal is to reveal if there is a link between historical tropes and current stereotypes or unveil the evolution of these stereotypes.

Natural & Physical Sciences

Biology

Poster U27 – Henrique Adabo

Mentor: Austin Nuxoll

Title: Persister Formation in Staphylococcus Epidermidis

Staphylococcus epidermidis is a gram-positive bacterial species that normally colonize on the skin of humans and mammals. As an opportunistic pathogen, S. epidermidis causes infection in individuals through hospital-acquired indwelling medical devices. In a recent study, it concluded that S. epidermidis caused over 50% of medical device infections located in the main joints and limbs. Antibiotic treatment of these infections is often unsuccessful, leading to chronic, relapsing infections that lead to the removal of the medical device. A likely explanation for these observations is persister cells, which are dormant, phenotypic variants of bacterial cells that show tolerance to an antibiotic. Recent research on the related pathogen, Staphylococcus aureus, demonstrates persister formation is likely dependent on energy depletion through a disrupted tricarboxylic acid (TCA) cycle. To test our hypothesis that S. epidermidis has a similar mechanism of persister formation through decreased TCA cycle activity, we used ethyl methanesulfonate (EMS) mutagenesis on the 1457 strain of S. epidermidis. Creating random mutations in the genome, we have seen increases in tolerance to the antibiotic vancomycin through enrichment of the EMS-treated strain compared to the 1457 wild type. Upon further enrichment of antibiotic tolerance in the EMS-treated strain, we will send the isolates for sequencing to identify possible mutations that are the cause of the high persister formation. These experiments will identify a mechanism of persister formation and determine whether a conserved mechanism exists between S. aureus and S. epidermidis or whether a unique mechanism of persister formation exists in S. epidermidis.

Poster U28 – Gabrielle Buttermore

Mentor: Letty Reichart

Title: Identification of Variable Microsatellite Loci for Baltimore Orioles captured in South Central Nebraska

During May (Spring) each year, migratory Baltimore Orioles (BAOR) stop along the Platte River in south central Nebraska before continuing north. Individual BAOR were

trapped in south central Nebraska during migration in 2016, 2017, 2018 and 2019. In Nebraska, there are hybrid orioles, where parents may be a mixture of Bullocks Orioles and Baltimore Orioles. In order to better understand the genetic makeup of BAOR migrating through Nebraska, we extracted DNA from blood samples and tested for multiple genetic loci to determine molecular markers that are variable in BAOR captured in Nebraska. In the future, variable loci will be used to further evaluate the genetic make-up for BAOR captured in Nebraska.

Poster U29 – Zach Carter

Mentors: Brian Peterson, Kim Carlson, Brandon Luedtke, & Casey Schoenebeck

Title: Genetic Confirmation and Predictive Antler Metrics of Cast Antler Match-Sets in White-Tailed Deer

Antlers are perennial paired appendages that are cast annually by cervid species. Cast antlers can be used to compare antler size between populations, assess management strategies, and evaluate deer health. However match-sets are difficult to determine as sets are assumed based on physical proximity antler similarities (size, coloration and points) which can confound those same assumptions. Studies have investigated asymmetry and fluctuating asymmetries of captive and harvested white-tailed deer herds; however cast antlers of free-ranging white-tailed deer to determine the best metric to confirm a match-set have not been investigated. The objectives of this study were to 1) confirm genetically individuality of cast antler match-sets, 2) determine the age-specific distance match-sets are cast, and 3) identify the best age-specific pre- and post-cast antler metrics to confirm a match-set. Match-sets (>100) of free-ranging white-tailed deer were collected in Nebraska. Freshly cast antlers were utilized to confirm genetic individuality of suspect sets using the hypervariable d-loop of the mtDNA. The distance antler sets were dropped from each other was evaluated by age group. Fourteen antler metrics were taken on each cast antler. We determined distance between match-sets were cast further ($P = 0.04$) for ≥2.5 yr-olds than 1.5 yr-olds. We found that the best metrics to define a match-set for both yearlings and older deer included antler pedicle seal depth, weight, circumference and beam length. Our study supports the continued use of cast antlers, as pedicle seal depth remains a unique account of individual deer health not accessible from harvested deer.

Poster U30 – Trevor Daubert

Co-Author: Kennedy Kluthe

Mentor: Austin Nuxoll

Title: Staphylococcus Aureus Persister Cells have Increased Survival to Components of Innate Immunity, Leading to Persistence within a Catheter-associated Biofilm Infection

Staphylococcus aureus is known for its ability to cause chronic reoccurring infections in clinical settings. The organism's ability to thrive despite antibiotic treatment has led to the severity of disease that is often exhibited with these infections. It has been hypothesized that energy-dependent persister formation leads to antibiotic tolerance in *S. aureus*. Persister cells are a dormant-like phenotypic variant of *S. aureus* that resemble cells growing in stationary phase. Previously, it was shown that a knockout in the tricarboxylic acid (TCA) cycle gene, *fumC*, which reduced intracellular ATP, led to an increase in the number of persisters. While persisters have been examined in relationship to antibiotic tolerance, it is currently unknown how persisters interact with the innate immune system. Considering a vast amount of chronic reoccurring infections in a clinical environment involve a biofilm, persisters were examined in a biofilm-associated catheter infection within a mouse. Following a 9 day infection, the *fumC* knockout exhibited increased survival within the tissue surrounding the catheter and within the heart compared to wild type *S. aureus*. Fluorescent activated cell sorting (FACS) analysis revealed similar recruitment of M1 and M2 macrophages, as well as neutrophils, suggesting there was not a difference in immunogenicity between the two strains. The *fumC* knockout exhibited increased survival compared to wild type *S. aureus* within a macrophage demonstrating persisters are better equipped to tolerate the innate immune system. These results indicate persisters are not only a problem with antibiotic treatment but are also better suited to survive the host's immune system leading to increased survival within a host.

Poster U31 – Britney de Leon

Co-Author: Abbie Frazee

Mentor: Kimberly Carlson

Title: Characterization of Nora virus infection in pupal Drosophila melanogaster

Nora virus is a picorna-like virus that appears to display no pathogenic affects, even at high viral titers. Previous research has shown *D. melanogaster* that are infected with Nora virus become significantly slower with time, compared to *D. melanogaster* who are not infected with Nora virus. This experiment is aimed to explore when the flies become infected, as this has not been done before. We will carry out the experiment on *D. melanogaster* at the larval and pupal stages of life. We have collected 100 flies from our previously tested Nora virus infected and Nora virus uninfected stocks. We placed these 100 flies into 16 bottles: 8 bottles of Nora virus infected and 8 bottles of Nora virus uninfected, giving us 800 flies in total. We have then left these flies alone for 6 days to multiply and expand our stock size. We will then group these flies into 25 couples for each bottle. Four of the eight bottles of Nora virus infected flies are to test larva, while the other four bottles are used to test pupa. This process is the same for the eight bottles of Nora virus uninfected flies. The couples

are allowed to mate for two days to produce offspring and are consequently morgued. These offspring are what we will be tested to determine whether or not these flies have been infected, and at what stage they contract Nora virus, if they do become infected. After this we will morgue the parents, letting the pupa and larva grow for an additional five days. By allowing the pupa and larva to grow, we give them time to eclose from the egg stage into the larval and pupal stages. We will then collect the larva as well as the pupa from our four bottles for RNA analysis to determine when, if at all, these flies become infected. At the same time, we will measure the distance the Nora virus infected larva have traveled and compare it to the measurements we get from Nora virus uninfected larva's migration. In our results we are looking to see if the flies can contract Nora virus at the pupa and larva stages as well as if the mobility of our flies have been affected at these stages.

Poster U32 – Josh Hergenreder

Mentor: Gregory Pec

Title: Recovery of Soil Microbial Communities following Removal of Eastern Redcedar

Eastern redcedar is considered a native invader in eastern North America and has expanded rapidly in recent years into open and semi-arid grasslands. This encroachment has led to declines in biodiversity, lowered habitat quality, and has altered nutrient cycling within these ecosystems. Soil microbes partly underlie successional trajectories of plant communities, yet their role in restoration is often overlooked. In particular, soil microbes are essential to ecosystem functions such as carbon and nutrient cycling as well as succession. Here, I will test the relative importance of a common management tool – mechanical removal – used in restoration on the recovery of soil microbial communities.

Poster U33 – Leigh-Anne Lehmann

Mentor: Joseph Dolence

Title: Male Mice are Protected against Developing PN-specific Adaptive Immune Responses

The mechanism of how peanut (PN) initiates immune responses to elicit PN allergy is limited. PN is commonly found in household dust and we have shown that PN exposure via inhalation sensitizes mice. Little is known about how sex differences impact the ability of the immune system to mount PN-specific immune responses. This study compared male and female mice exposed to PN in 10-day and month-long mouse models to elucidate how sex differences impacted the adaptive immune response to PN. These responses are critical to understand because adaptive immune responses to PN lead to the development of PN-specific IgE antibody responses responsible for driving life-threatening anaphylactic reactions to PN. Following exposure to PN flour by inhalation during a 10-day period, lungs and lung draining lymph nodes were collected from BALB/c male and female mice and processed for flow cytometric analysis. CD19+ B cells, CD3e+ T cells, CD11c+ dendritic cells, and CD11b+ macrophages were severely reduced in male mice exposed to PN when compared to their female PN-exposed counterparts. Furthermore, BALB/c and C57Bl/6 male mice exposed to PN generated significantly lower PN-specific IgE antibody responses and milder anaphylactic reactions upon PN challenge compared to their female counterparts. This data suggests that testosterone play a role in dampening adaptive immune response to PN, thus weakening the ability of these cells to coordinate the IgE-mediated allergic response against PN. Overall, this study provides critical insight into how sex differences could play a role in regulating the development of immune responses to PN.

Poster U34 – Max Lindgren

Mentor: Dawn Simon

Title: Heterogeneity of rRNA intron in Lichen Fungi

Ribosomal RNA (rRNA) genes in lichen and allied fungi often contain numerous introns. The presence of spliceosomal introns in these genes is unusual, which makes the system a model for studying intron origin. Ultimately we want to understand the dynamics of intron loss and gain in this system. However, this is complicated by the fact that rRNA genes are found in multiple copies within the genome. Concerted evolution is thought to be the driving force of evolution involving genes that contain multiple copies (e.g. rRNA genes) and should result in sequence identity across gene copies. Previous work suggests that this process is incomplete in rRNA in lichen fungi. To better understand the evolutionary history of rRNA spliceosomal introns, we must first understand how the underlying genes evolve. This is the aim of this project. Here, we will use fungal cultures isolated from lichen to determine whether there is intron heterogeneity across rRNA copies within the same genome.

Poster U35 – Amanda Macke

Mentors: Kimberly Carlson & Darby Carlson

Title: Expression of Vir-1 and Vago in Nora Virus Infected Drosophila melanogaster Hemolymph

Drosophila melanogaster is a valuable model to study the immune system. Analysis of the *D. melanogaster* immune response to viral infection can be used to inform future immune research and applications to human innate immunity. Two *D. melanogaster* proteins, Vago and Virus-induced RNA 1 (Vir-1), are candidates for analysis due to upregulation in response to viral infection but are uncharacterized in response to Nora virus. Nora virus is a persistent, picorna-like virus, which replicates in the gut of *D. melanogaster*. While the complete pathology of Nora

virus is unknown, we have identified a locomotor defect and decreased longevity. We hypothesize that Nora virus is circulating in the hemolymph of Nora virus-infected *D. melanogaster*, allowing for migration beyond the gut. Western blot and qRT-PCR analysis has demonstrated the presence of Nora virus capsid proteins and RNA in the hemolymph of Nora virus-infected *D. melanogaster*, suggesting these viral components may circulate to other tissues and cause novel effects including the observed locomotor defect. Analysis by qRT-PCR has demonstrated biphasic viral load and closely associated *vago* transcription levels, which suggests an antiviral function of vago. Additionally, Western blot analysis has demonstrated vir-1 expression in uninfected *D. melanogaster* suggesting an alternative function.

Poster U36 – Rebecca Meusch

Mentor: Dawn Simon

Title: Evolution of a Nuclear rRNA Intron in the Lichen Physcia

Introns are found in all sequenced eukaryotic genomes, yet their origins are unclear. This is due to their antiquity and the lack of selective pressure, which results in high sequence divergence. This has made finding intermediate forms difficult. However, some of these issues appear to be mitigated in nuclear ribosomal RNA (nrRNA) in lichen-forming and allied fungi. Introns are particularly abundant in the genus *Physcia*. In this project, we focus on introns at two sites (1092, 1094) within the large subunit (LSU) rRNA gene. Previous work showed that these introns never co-occur in the same repeat, but they are both found in the genomes of at least 36 different isolates. Based on sequence similarity we hypothesized that the two introns share a common origin. In this study, we sought to expand the sample size by sequencing the intron from different isolates. However, until now neither intron has been found in any of the studied specimens. This has been confirmed using five sets of intron-specific PCR primers. The next step is to re-visit some of the same locations as the previous study to determine if introns have been lost in these species or if intron presence/absence varies based on geographic location.

Poster U37 – Michael Rohde

Mentor: Keith Geluso

Title: Use of Soapweed Yucca (Yucca glauca) by Rodents and Other Vertebrates in Western Nebraska

Prairies ecosystems of the Great Plains have undergone major degradation during the last century. Although grasses dominate these ecosystems, soapweed yucca (Yucca glauca) is a conspicuous and common shrub present throughout the Great Plains. Limited data are known regarding how small vertebrates use this yucca species. Our study examined the diversity of vertebrates that visit Y. glauca and the functions this plant yielded for those organisms in western Nebraska. We documented 7 mammalian, 12 avian, and 3 reptilian species using yucca for cover, perches, and nests. We captured significantly more rodents (207 individuals) in areas with yucca compared to areas without yucca (71 individuals). Species richness of small mammals did not differ in the presence of yucca (7 species) compared to areas without yucca (6 species). The deer mouse (Peromyscus maniculatus) showed the greatest difference in abundance, with 83 captures in areas with yucca and only 14 in areas without yucca. Furthermore, captures of Ord's kangaroo rat was significantly greater in areas with yuccas (33 captures) compared to areas without yucca (11). 71% of deer mice ran to yuccas upon release from traps. Our findings demonstrate the ecological importance of Y. glauca to vertebrates in this ecosystem dominated by grasses. Furthermore, both rodent species associated with yuccas are agents of seed dispersal and plant propagation via their caching behaviors that likely help to maintain prairie ecosystems.

Poster U38 – Tyler Shaner

Mentor: Joseph Dolence

Title: Antigen-presenting Cells Display Sex-specific Differences in Ability to Mount Immune Response to Peanut

The mechanism of how peanut (PN) initiates immune responses to elicit PN allergy is limited. PN is commonly found in household dust and we have shown that PN exposure via inhalation sensitizes mice. Little is known about how antigen presenting cells (APCs), a type of immune cell critical to mount immune responses, function in response to airway exposure to PN. Even more unclear is how sex differences impact an APCs ability to respond to PN. This study compared male and female mice exposed to PN in 3-day mouse models to elucidate how sex differences impacted the response of various APCs to PN. To study APCs, lungs and lung draining lymph nodes (dLN) were collected from BALB/c male and female mice after exposure to PN flour by inhalation three times during a 3-day period (days 0, 1, 2). Single cell suspensions were stained with antibodies to identify APCs (macrophages, dendritic cells, and B cells) responsive to PN by flow cytometry. Interestingly, CD19+ B cells, CD11c+ dendritic cells, and CD11b+ macrophages were severely reduced in male mice exposed to PN when compared to their female PN-exposed counterparts. This data suggests that male sex hormones play a role in dampening the ability of these cells to respond to PN. Overall, this study provides a new understanding into how APCs respond to PN and for the first time provides insight into how sex differences could play a role in regulating the initial steps in the development of immune responses to PN.

Poster U39 – Skyler Smith

Mentor: Keith Geluso

Title: Bats of the Gallos and Mangas mountains of New Mexico

Twenty-nine species of bats occur in New Mexico, with 22 species known from the Mogollon Plateau in southwestern parts of the state. However, almost all bat records from this region are from central and southern parts of this complex of mountain ranges. Minimal information is available on the species that inhabit some isolated small Mountain ranges in northern parts of this region. We are proposing an investigation on the distribution, abundance, and reproductive activity of bats in the Gallos and, Mangas mountains in Catron County, New Mexico. From May 2020 to July 2020, we will deploy mist nests over small ponds and stock tanks within these mountains to survey for bats. With fourteen bat species within the Mogollon Plateau considered species of concern, we will acquire a more complete understanding of their geographic distribution and relative abundance in the region to help protect them. Such baseline data are needed to determine whether population numbers change due to diseases, habitat alterations, and other challenges in the future, as many bats in North America already have suffered population declines.

Poster U40 – Rishav Srivastava

Co-Author: Caleb Capellen

Mentor: Surabhi Chandra

Title: Effect of Hyperglycemia on Anti-cancer Compounds

Background/Aim. It has been known that many forms of cancer cases advance to become a lot more aggressive if the patient is also diabetic. Cancer cells are already known to metastasize at a very rapid rate, but the rate is further increased in the presence of diabetes. In addition, diabetes can also increase the incidence and recurrence of cancer. Despite the advancement in cancer chemotherapies, the challenge lies in the fact that cancers in diabetic patients are refractory to these drugs. Our hypothesis is that known natural and synthetic compounds with anticancer properties will exhibit reduced toxicity against cancer cells in presence of high glucose conditions. *Materials and methods.* The compounds that will be used are curcumin and doxorubicin. We will be treating MDA-MB-231 cancer cells with these two compounds along with high levels of glucose (25 mM) to observe the effect on cytotoxicity. Cell survival assay will be performed using PrestoBlue dye. We expect that higher doses of anticancer compounds will be required to cause cytotoxicity under high glucose exposure. This is an important study to understand the prognosis of cancer patients with concomitant diabetes.

Poster U41 – Latjor Wal

Mentors: Mary Harner & Emma Brinley Buckley

Title: Time-lapse Monitoring of Temporal Variation in Snow Cover across the Platte Basin

The goal of this study was to demonstrate a research application of time-lapse cameras utilized by the Platte Basin Timelapse (PlatteBasinTimelapse.com), specifically to determine how the timing and extent of snow cover varies among years at a site in the Sandhills of Nebraska. Images from October through April were taken from a preestablished database and analyzed to compare snow cover between a dry (2012–2013) and wet (2016–2017) year. The focal camera was located by the Gudmundsen Sandhills Laboratory. Two images per day, one from 10 am and one from 2 pm, were viewed and labeled in Adobe Bridge. Image snow cover was visually ranked from 0-5 in order of increasing snow cover intensity and correlated with corresponding weather data from a nearby weather station. Differences between the wet and dry year snow dynamics were accurately determined by time-lapse imagery. The research demonstrated the potential quality of time-lapse images for phenological application and the importance of time-lapse camera networks for monitoring and assessing environmental and ecological change.

Poster U42 – Michaela Walker

Co-Author: Luke Hamilton

Mentors: Surabhi Chandra & Mahesh Pattabiraman

Title: Cytotoxic Effects of Curcumin in Adenosine Receptor Transfected Cells

Following heart disease, cancer is the second leading cause of death in the United States. One quarter of all deaths in the United States is due to cancer. Adenosine receptors are a novel class of receptors that are recently being investigated as anticancer targets. They are ubiquitous and have four different types including A_1, A_{2A}, A_{2B}, and A_3. It has been shown that some cancer cell lines, namely MDA-MB-231 cells, exhibit increased levels of A_{2B} adenosine receptors (AR) as the main adenosine receptor subtype. This leads researchers to investigate drugs that will target adenosine receptors. Research on the cytotoxic effects of curcumin has shown promising results. This study focuses on the cytotoxic effects of curcumin and its analogs in adenosine receptor transfected cells. Our study will use three human embryonic kidney cell lines that will each express one of the adenosine receptor subtypes, A_{2A}AR, A_{2B}AR, and A_3AR. Given its cytotoxic characteristics, we will treat these cells with curcumin and investigate its binding affinity for the adenosine receptor subtypes. We will study the effects of both curcumin and iso-curcumin, which is altered via photochemistry, changing it from *trans-trans* to *cis-trans*. We have chosen to use fluorescent ligand competitive binding assays to analyze the cytotoxicity of the curcumin. So far, our results show that cytotoxic effects

of curcumin have been seen at higher concentrations. After analyzing the effects of curcumin on A_{2B}AR, we will analyze the effects of iso-curcumin. Thus far, we can conclude that at higher concentrations curcumin could be a viable cancer treatment option because it targets the A_{2B}AR subtype, which is prevalent in cancer cells.

Poster U43 – Jonathan Wentz

Mentor: Letty Reichart

Title: Estimating Population Size and Habitat Use of Migratory Waterfowl at Harlan County Reservoir, Nebraska

In North America, many species of waterfowl follow north-south migratory paths each spring and fall. Suitable habitat along migratory paths is necessary to provide stop-over sites where birds can rest and refuel along their migratory path. Waterfowl species, ducks and geese, are commonly observed on large lakes and reservoirs during their migratory path. For example, many waterfowl species have been observed on Harlan County Reservoir, located in south central Nebraska, but no previous studies have estimated habitat use by waterfowl on this reservoir. Harlan County reservoir is primarily managed as an outdoor recreation area, water holding facility, and recreational fishery. The main reservoir has multiple coves along the periphery of the reservoir. Each cove likely provides different habitat for migratory waterfowl, because the coves vary in their level of seclusion (e.g., coves with marinas and campgrounds likely have a higher level of human disturbance) and connectedness to the main reservoir (e.g., some coves are connected, some are partially connected and some are disconnected from the main reservoir). For this project, I will estimate cove habitat use by waterfowl species during spring and fall migration. Specifically, I will conduct surveys to estimate waterfowl population sizes in coves. Estimating population sizes and determining habitat use by waterfowl will allow us to identify important habitat used by migratory waterfowl at Harlan County Reservoir. The results of this study will be useful for conservation management decisions to maintain functional habitat use for both game fish and migratory waterfowl species.

Chemistry

Poster U44 – Nick Balerud

Mentor: Michael Moxley

Title: Solvent Viscosity Studies Reveal the Rate Limiting Step in the Carnitine Acetyltransferase Reaction

Carnitine acetyltransferase (CrAT) catalyzes the reversible transfer of an acetyl group between acetyl-CoA and carnitine, forming CoA and acetyl-carnitine. This reaction is important in mitochondria during times of high ATP demand such as during exercise, and knockouts of this enzyme have shown to be more susceptible to insulin insensitivity, as is the case in diabetics. Therefore, the kinetics of this reaction are important to sustain a healthy metabolism.

We wanted to understand what step limits the CrAT reaction, substrate binding, the chemical step, or product release. This question can be investigated by varying the viscosity of the solvent with a viscosigen such sucrose or glycerol. While varying the viscosity, one also needs to vary substrate concentration to determine the viscosity effects on fundamental enzyme kinetic parameters such as k_{cat}/K_m and k_{cat}.

A large decrease in k_{cat}/K_m implies that the reaction is limited by substrate diffusion/binding. A large decrease in k_{cat} implies the reaction is limited by product release, and no significant change in either k_{cat}/K_m or k_{cat} implies the reaction is limited by the chemical step. Upon increase in relative viscosity we found that the k_{cat} for the CrAT catalyzed reaction was greatly decreased, whereas the k_{cat}/K_m was not, suggesting that the CrAT reaction is limited by product release.

Poster U45 – Kenneth Ernest

Co-Author: Tara Buettner

Mentor: Annette Moser Lintz

Title: Glyphosate Determination in Soil Samples Using LC-MS

Glyphosate is typically quantified as a sum of both glyphosate (N-phosphonmethyl glycine) and its main metabolite (aminomethylphosphonic acid, AMPA) and generally is derivatized prior to analysis to obtain better detection limits. A method capable of quantifying total glyphosate was developed for soil samples by evaluating various extraction methods prior to derivatization with 9-flourenylmethyl-chloroformate (FMOC) and analysis by LC-MS. Total glyphosate concentration had a linear range of 0.1 – 20 mg/kg for spiked soil samples. Additional method development is in progress to design a method capable of extracting glyphosate and AMPA from soybean tissue samples.

Poster U46 – Keith Everitt

Co-Auther: Hannah Schmitz

Mentor: Haishi Cao

Title: Investigating the Effect of Electron Withdrawing Group to a Nucleophilic Addition Reaction for the Detection of Thiol-containing Species

In our group, we developed a fluorescent sensor based on 1,8-naphthalimide dye, which was able to rapidly react with HSO_3-, based on a nucleophilic addition mechanism. In the presence of HSO_3-, *NAS-2*, containing a trifluoromethyl group for electron withdrawal, showed a ratiometric change of absorption spectra and a strong fluorescence quenching in 2 minutes at 25˚C. To measure samples with a small volume, *NAS-2* was applied to a microfluidic device, in which a consistent result was obtained, indicating *NAS-2* could be used as an approach

for quantitative detection of sulfite with a high affinity and selectivity in the aqueous media. At low concentration, high affinity and sensitivity HSO_3- over other ions were both observed for *NAS-2*. Upon addition of HSO_3- to the sensor solution, and instant color change was also observed along with the fluorescence quenching, which provided a ratiometric signal for rapid detection of HSO_3-. *NAS-1*, in which the trifluoromethyl group was exchanged for a methoxy group, was another developed sensor that did not show a reaction with HSO_3- to give a fluorescence quenching.

Poster U47 – Jared Hunke

Mentor: Frank Kovacs

Title: Produce Protein Crystals of Amino-Levulinic Acid Dehydratase (ALAD) from E. coli for X-ray Crystallography

The purpose of this experiment is to produce crystals of Amino-Levulinic Acid Dehydratase (ALAD). The enzyme was first produced in competent cells and then extracted by lysing the cells and centrifugation. The protein was then purified using column chromatography in preparation for crystallization. The protein was added to sixteen wells along with differing buffer solutions. The buffers consisted of Tris with pH ranges of 8.1-8.4, ammonium sulfate with a range of 2-5% saturation, zinc sulfate, β-meraptoethanol, levulinic acid, and deionized water. The wells will be left to sit for 2-4 weeks, and then checked for crystals using microscopy. If crystals are not obtained from the first set of solutions, then different buffer solutions will used to redo this test to try and obtain the crystalized protein.

Poster U48 – Akshay Kashyap

Mentor: Mahesh Pattabiraman

Title: Extension of the Cavitand Mediated Photodimerization Approach: Photodimerization of 3-(2-naphthyl)-acrylic acid

Photocycloaddition (PCA) is a particularly useful method in the synthesis of dimers from alkene systems. This method is heavily employed in the synthesis of polymers and natural product analogs with many more applications being researched. An important aspect of photodimerization involves directing selectivity in the photocycloaddition process. This can be done through complexation of alkenes in cavitands like cyclodextrin in specific host-guest ratios. However, further selectivity can be directed by interactions of functional groups present. This study aims to analyze the π−π interaction through the use of 3-(2-naphthyl)acrylic acid and the interactions ability to direct selectivity in photocycloaddition reactions.

Poster U49 – Michael Kratochvil

Mentor: Michael Moxley

Title: Evidence of a Preferred Kinetic Pathway in the Carnitine Acetyltransferase Reaction

Mammalian carnitine acetyltransferase (CrAT) is a mitochondrial enzyme that catalyzes the reversible transfer of an acetyl group from acetyl coenzyme A (AcCoA) to carnitine. AcCoA and carnitine are important metabolites involved in the aerobic utilization of glucose and fatty acids, where AcCoA is utilized by the TCA cycle and carnitine is needed for fatty acid transport and subsequent oxidation within mitochondria. CrAT knockout studies have implicated this enzyme in glucose tolerance and metabolic flexibility, a term referring to the balance of glucose, fatty acid, and amino acid oxidation— critical for a healthy metabolism. These recent physiological findings have motivated new interest in the kinetics of CrAT function, as altered CrAT kinetics leads to impaired glucose and fat catabolism.

To gain insight into CrAT kinetics, we conducted enzyme kinetic experiments on a stopped-flow (rapid mixing) instrument in various enzyme substrate/product conditions and analyzed the data rigorously by global fitting and simulation. These kinetic experiments, which follow the change in UV absorbance of AcCoA/CoA, allow for a more direct and accurate means of following the reaction, rather than utilizing a coupled reaction strategy used more recently. Furthermore, pre-incubation of substrate and product revealed a newly discovered, preferred pathway in the CrAT reaction. The preferred pathway requires ordered substrate binding, such that out-of-order binding leads to catalysis that is greatly attenuated.

Poster U50 – Alex Larsen

Co-Authors: Nate Garringer & Kaleb Christensen

Mentor: Kristy Kounovsky-Shafer

Title: Using 3D Printed Devices to Elute and Concentrate Mesoplasma florum DNAMolcules

In order to test the elution and concentration device with larger DNA molecules, *Mesoplasma florum*, a small bacterial genome, was digested with ApaI, a restriction enzyme, to create two fragments of DNA. Prior to digestion, the *M. florum* cells were imbedded into an agarose insert to protect the DNA molecules during cell lysis. Once the cellular debris was removed, DNA was digested with ApaI restriction enzyme. A 3D printed elution concentration device was affixed to a glass slide and an acrylamide "roadblock" was polymerized inside the device to slow down the progression of DNA. The insert with DNA was placed in a 3D printed elution-concentration device and DNA was eluted into the solution and concentrated in front of the acrylamide roadblock. The amount of DNA eluted, concentrated and recovered was measured. Samples were

placed within a pulsed field gel electrophoresis system to determine if DNA molecules were full length.

Poster U51 – Bryant Menke

Mentor: Kristy Kounovsky-Shafer

Title: Determned Electorosmotic Mobility in Microchannels in a Dynamic Range of Low Ionic Strength Solutions

The overall mobility of an analyte in a solution inside a microfluidic device under an applied voltage is affected by two forces: electroosmotic and electrophoretic forces. Understanding how these forces vary in low ionic strength solutions will develop a better comprehension of the forces at play within the microfluidic-nanofluidic device utilized in Nanocoding and enable better designed devices for genome analysis. Five different ionic strengths (18 mM, 9 mM, 2 mM, 1 mM, and 0.5 mM NaCl) and three different plasma treatments (18 seconds, 36 seconds, 54 seconds), which affect the surface charge of the PDMS device, were tested to determine how electroosmotic forces are affected by plasma treatment and ionic strength. Rhodamine B dye was loaded into a microchannel as a plug and imaged with an inverted fluorescence microscope to measure the electroosmotic flow inside the microchannel. Additionally, current was measured to determine electroosmotic mobility.

Poster U52 – Samantha Rau

Co-Authors: Alex Larsen, Bryant Menke, Nate Garringer, & Cody Masters

Mentor: Kristy Kounovsky-Shafer

Title: Using a Pulsed Waveform to Elute Mesoplasm florum DNA Molecules in 3D Printed Devices

In order to use physical mapping systems such as Nanocoding or Optical Mapping to discover variations among long DNA molecules, the molecules must be spread out to span a large enough region that there is enough unique information on either side of that region of the genome. The fragility of large DNA molecules prevents the molecules from remaining full length when routine molecular biology techniques are used to extract DNA from cells, so cells were embedded in an agarose matrix to protect the molecules during cell lysis. Once the cellular debris was removed, DNA molecules must be eluted from the insert. A 3D printed polyacrylamide (PLA) device was developed and affixed to a glass slide to elute and concentrate *Mesoplasm florum* DNA. An acrylamide gel was polymerized in the device to act as a "roadblock" to slow down the progression of DNA through the device. Using an electric field, DNA molecules were eluted from the agarose matrix into solution and concentrated at the acrylamide roadblock. The concentration of DNA recovered at the "roadblock" and remaining in the agarose gel was measured to determine the location of the DNA molecules and how effective the elution-concentration device was at concentrating DNA at the "roadblock". DNA collected from the concentration region was run on a gel to determine if the molecules were full length.

Poster U53 – Samantha Schindler

Mentor: Michael Moxley

Title: pH-dependent Kinetic analysis of Thiol Reactive Compounds for the Assessment of Enzyme Kinetics

Enzymes are responsible for catalyzing most biochemical reactions, and the study of enzyme kinetics is a cornerstone of biochemistry. Many biochemical reactions are, however, difficult to monitor due to lack of signal. To circumvent this issue, many enzyme catalyzed reactions are studied by coupling the reaction to another that absorbs or fluoresces, producing a convenient signal to follow the reaction.

Coenzyme A (CoA) is a ubiquitous biochemical involved in central catabolism such as in the aerobic breakdown of glucose and fatty acids. Several enzymes use CoA as a substrate or product of the reaction they catalyze. CoA contains a reactive thiol group that is often coupled to or reacted with thiol probes that produce absorbance at a certain wavelength, a means to continuously follow the reaction.

The kinetics of the coupling reaction is often overlooked but important as it reports on the kinetics of the reaction of interest. Here we assessed and kinetically modeled the reaction of CoA with two commercially available thiol reactive probes, DTNB and DPS. We have found that DPS is kinetically optimal, compared to DTNB, at physiological pH and below. This result is consistent with a kinetic model that simulates a protonated DPS species that catalyzes the reaction at lower pH.

Poster U54 – Jake Weston

Mentor: Kristy Kounovsky-Shafer

Title: Effect of Temperature on Intercalation of Fluorescent Dyes

The fluorescent dyes in the study includes a variety of dyes that are used to stain DNA that are within the TOTO-1 family of dyes, including YOYO-1. These dyes intercalate into the DNA by inserting between the base pairs of the DNA. The intensity of the dye intercalated into the DNA molecule can be monitored using a fluorimeter. Although, in previous studies, the intensity of the dyes has decreased over time while a voltage was applied over long periods of time. This created a problem, because when the intensity decreased, it was difficult to detect the DNA during the experiment. Therefore, we are incubating DNA stained with YOYO-1 at a dynamic range of temperatures to measure how the intensity changes with temperature.

Cyber Systems

Poster U55 – Noah Meyer

Mentor: Sherri Harms

Title: Lloyd the Monkey 2

When an evil army attacks the faraway planet Grecia, simian swordsman Lloyd teams up with the planet's princess to push back the invaders and save the world in the second chapter of the independent video game series.

In the game, players navigate a pair of characters through a series of obstacle courses by alternating between characters and combating enemies. Exploration is strongly encouraged, as the characters grow stronger the more items they find in the levels.

Poster U56 – Nirajan Shrestha

Mentor: Angela Hollman

Title: Effectiveness of Thin Client from IT perspective

The fundamental objective of this study is to understand and evaluate the perspective of IT personnel's opinion on whether thin client or fat client can offer more benefits to the user as well as their organizations. Using IT veterans as the sample population, this study seeks to understand why the thin client has not been adopted more fully. The research question of the study is "Do IT personnel accept that thin client is more effective than the fat client? "For the purpose of this study, a questionnaire was developed, as no instrument had been previously developed. There were two primary information sources for the questionnaire, which were an in-depth literature review and the researcher's personal experience in working with IT. From the questionnaire results, IT personnel appeared to support fat clients in categories of security and performance. Surprisingly, price and long-term viability were also major factors in support of the fat client, even though thin clients appear to be less costly. IT reported that although network and hardware are minor issues for thin clients, software is a frequently occurring issue. Right now, IT personnel reported that the fat client system is more popular, even though IT professionals agree that it has similar attributes when compared to the thin client.

Poster U57 – Preeti Timalsina

Mentor: Angela Hollman

Title: The Research Process on the use of Cloud Computing on a Daily Basis

Cloud Computing is one of the most useful concepts these days and we have been using various platforms on the internet without realizing they work on the concept of cloud computing. The research was conducted to compare with a study operated in the UK which looked for the reasons why the managers in the small businesses shifted to Cloud Computing through their survey on numerous factors. My research focused more on security, availability and sustainability factors on all kinds of users of Cloud interface and I can conclude that the whole journey of URF has educated me how research functions. I am also sure that my well explained research methodology will turn out very useful to the beginners on research field like I had been.

During my opportunity to participate in the Undergraduate Research program, I used my research topic to understand and gain further knowledge on how the research arena works and how the results can be disseminated and impactful in the professional setting. The vast part of my research methodology was contained by the literature review found on diverse sources like google scholar and UNK library. Identifying the type of data collection, I wanted to use and an extra research and study on the development of the prototype were also an important procedure of the whole process. I am using Qualtrics survey tool to finalize my prototype and will be working on piloting the tool. The poster presentation will be a detailed explanation of literature review and the outcome of the implemented prototype and systems.

Mathematics & Statistics

Poster U58 – Julie Kent

Mentor: Derek Boeckner

Title: Exploration of the Second Neighborhood Conjecture

Examining specific graphs, we show that the Second Neighborhood Conjecture is true for any orientation of graphs from selected classes. The Second Neighborhood Conjecture states that for any oriented graph there is a vertex whose second neighborhood is at least as large as its first neighborhood. We began considering the Petersen graph and then moved to the class of Kneser graphs finding some positive results about subclasses of Kneser graphs.

Physics & Astronomy

Poster U59 – Lena Janssen

Mentor: Kenneth Trantham

Title: Numerical Solution to the Rayleigh-Sommerfeld Equation

The Rayleigh-Sommerfeld (R-S) equation describes the diffraction of waves from multiple coherent sources. The R-S equation does not have an analytical solution but there are two extreme cases available to predict the intensity at different angles θ, at a distance close (Fresnel) and far away (Fraunhofer) from the source. We numerically solve the R-S equation to predict the intensity I at any arbitrary observation distance R. Our solution approaches that predicted by Fraunhofer as $R \to \infty$. These predictions are compared to experimental measurements using sound with $\lambda \cong 0.07$ m.

Poster U60 – Walker Johnson

Mentor: Said Abushamleh

Title: Microwave Antenna for Wearable Electronics Applications

The design of antennas and electrical radiators for wearable electronics pose a particularly interesting set of requirements. Firstly, wearable antennas should be made flexible enough to be worn and to work in the proximity of user's body. Human factors require that a wearable antenna for Wireless Body Area Networks (WBAN) applications should be flexible and made to conform to the body, and to perform well when deformed. A wearable antenna must also be designed to prevent harm to the wearer, and to conform to regulations in place regarding the radiation they emit near the wearer. Furthermore the antenna must also be of a size that it can be incorporated into clothing easily. I will outline the research that I have conducted, and the important results achieved.

Poster U61 – Brandon Ramos

Mentor: Said Abushamleh

Title: Mutual Coupling and Interference Reduction in Antenna Systems using Defected Ground Structures DGS

Mutual coupling is an unwanted effect in antenna arrays that have multiple antenna elements. This coupling badly effects the behavior of antenna elements and also causes loss of information.

In order to make multiple antenna elements more efficient, it is important to reduce mutual coupling in communication. The Multiple Input Multiple Output (MIMO) technology was adopted to obtain significantly high data rates by installing multiple antennas at transmitters and receivers within the communication systems. In MIMO systems, electromagnetic mutual coupling among antenna elements is strongly observed.

Designing antennas for MIMO systems that have wide bandwidth is challenging due to trade-offs between inter-element spacing and mutual coupling. Therefore, reducing mutual coupling between antenna patches is one of the challenging issues in MIMO systems.

A patch antenna is a narrowband antenna that can be fabricated on a metal sheet bonded with an insulating dielectric substrate (slab), such as a PCB (Printed Circuit Board) and with a ground plane (metal sheet) attached to the opposite side of the substrate.

In this project, Defected Ground Structure (DGS) designs will be applied on an antenna system that contains multiple patches. The design will be compact due to very small separations between antenna elements. As a result, high mutual coupling among antenna elements is expected. Small and compact designs in electronics are significantly desirable in the industry due to several customer's needs.

Professional & Applied Studies

Communication Disorders

Poster U62 – Madison Clausen

Mentor: Philip Lai

Title: When Will We See Children's Language Scores Increase in Minimally Verbal Children Autism Spectrum Disorder (ASD)?

Autism is one of five disorders on the Autism Spectrum Disorder (ASD). Autism Spectrum Disorder is a childhood-onset developmental disorder. Individuals with ASD are characterized by deficits in areas such as lack of eye contact and social communication. According to the Autism Society, the prevalence of autism has risen to 1 in 59 births in the United States. The term "minimally verbal" is loosely defined as it varies case by case. However, it is most often referred to as an individual who uses mostly gestures and single words to express their wants and needs. Certain children with ASD need structure and a routine to function routinely. There are a limited number of studies that look at language in minimally verbal children with ASD because of the limited means of communication. For this project, our main question investigates how much improvement in eye contact and verbal utterances from year to year; is there an age where we see a significant improvement in the child's utterances? Also, we looked at how do the parent and child's utterances correlate? Signs and symptoms of lower functioning children with ASD was evident, and as time went on, increases in Eye Contact was not observed. For the child's utterances, we saw increases between Year 1 and Year 2, suggesting that development of language is occurring during these important developmental years. There was no clear pattern in which year we saw improvements, even when the children got older.

Poster U63 – Mackenzie Hamilton

Co-Authors: Jenilee Woltman & Sydney Ferrara

Mentors: Ladan Gazi Saidi & Miechelle McKelvey

Title: Music Therapy Effects on Dementia with Agitation: A Case Study

Music therapy shows positive effects on individuals with Dementia. This study investigated the effects of personally meaningful music (PMM) on communication, agitation and health status of an individual at the early stages of dementia. The participant was recruited through the UNK Speech, Language and Hearing clinic. We received consent and assent. She passed a functional hearing screening. We used a music preference instrument to create a PMM playlist for the patient. The participant attended 8 sessions of therapy; four in silence (Music-off),

the other four, the participant listened to the PMM playlist (Music-on). There was a 2-month break between Music on/off sessions. During Music-off sessions, the participant was encouraged to communicate with the researcher (20 minutes). During Music-on sessions, the participant was allowed to communicate with the researcher, but she was encouraged to relax and listen to the music (20 minutes). During all sessions, the participant completed a word recognition task (WRT). All sessions were video recorded. A General Health Status questionnaire (GHS) and the Geriatric Agitation Scale (GAS) were completed after each session by the researcher and 24h later by the participant's spouse. Response Times of the WRT were lower for Music-on condition as compared to Music-off. However, there was no difference between accuracy rates. We observe conflicting results for different components of the Agitation scale (GAS). All components of health status survey (GHS) improved. We are analyzing the Mean Length of Utterance to measure communication during each session. We will discuss the clinical application of our results.

Poster U64 – Mikaela Hansen

Co-Author: MacKenzie Meyer

Mentor: Ladan Ghazi Sadi

Title: A Unique Pattern of Stuttering in a Bilingual Adult: A Case Study

Stuttering is a speech disorder that involves frequent and significant disruptions with normal fluency and flow of speech. Stuttering is a form of neuropsychological disorder and is multi-factorial, with an unknown cause. This makes its treatment and management difficult. Still, stuttering is a disabling disorder and has a negative impact on behavioral, emotional and cognitive reactions and increases anxiety and isolation. Little research has been done on adults who stutter, and almost no research on bilinguals who stutter.

In this study, for the first time in the literature, we will describe a bilingual participant who stuttered as a child in her mother tongue (L1: Bulgarian). When she moved to the US at age ten, she stopped stuttering in her second language (L2: English). Today, as an adult, she reports that she still stutters in L1, but not her L2. After signing a consent form, we had the participant complete a demographic questionnaire including the pattern of her stuttering from ages (0-8 in L1 and 8+ in L1 and L2). The results allow us to describe the case and interpret her symptoms and possible contributing factors for recovery from stuttering L2, but not in L1 in the context of her unique social, psychological and personal factors, as well as the literature on the bilingual cognitive processing. We also describe the potential consequence of learning a second language on speech and language disorders, precisely stuttering. This case can shed some light on understanding the causes, development and recovery from stuttering.

Poster U65 – Kassidy Kirsch

Co-Author: Claire Neil

Mentor: Philip Lai

Title: al and Nonverbal Development in Toddlers with Autism Spectrum Disorder when Interacting with their Mothers Across Four Years

Children with Autism Spectrum Disorder (ASD) have significant impairments in social communication that interfere with personal, professional, and academic skills. The purpose of this study is to explore the linguistic behavior of the child with ASD around 2.5 years of age and through this longitudinal investigation, re-examine their linguistic behaviors for the next three years. The data included 10 sets of child-mother pairs as they engaged in a 15 minutes play session. Mothers were instructed to "play with your child as you normally would at home". Toys included a Mr. and Mrs. Potato Head and a Little People Animal Farm set. Media files were integrated into the Eudico Linguistic Annotator program. Inter-rater reliability exceeded 85% agreement for gestures and speech output by the child. Results for rate of speech across all four years indicated growth and development going from 2.09 words per minute on average at 2.5 years of age to 13.9 words per minute on average at 5.5 years of age. For gesture use, more variability was found throughout the four years. The largest increase in gesture use occurred when the child was 2.5 and 3.5 years of age. This increase in gestures may be related to the use of toy(s) the child was playing with during the session. Understanding more about the development of communication in children with ASD at both verbal and nonverbal levels can lead to more refined treatment methods based on each individual's strength and weaknesses as opposed to a 'one treatment fits all' approach.

Poster U66 – MacKenzie Meyer

Co-Author: Mikaela Hansen

Mentor: Ladan Ghazi Saidi

Title: Reflections on Stuttering Patterns at childhood in a Bilingual Adult: A Case Study

Stuttering is a speech disorder that involves frequent and significant disruptions with normal fluency and flow of speech. Stuttering is a form of neuropsychological disorder and is multi-factorial with an unknown cause, which makes treatment and management difficult. Stuttering also has a negative impact on behavioral, emotional, and cognitive reactions and increases anxiety and isolation. Little research has been done on adults who stutter, and almost no research has been done on bilingual individuals who stutter.

For the first time in the literature, we describe a bilingual participant who stuttered as a child in her mother tongue (L1). When she moved to the US at the age of ten, she stopped stuttering in her second language (L2: English).

Today, as an adult, she still stutters in L1, but not her L2. After signing a consent form, we had the participant complete a demographic questionnaire including the pattern of her stuttering, record a sample of speech in both languages, complete a survey on her demographics and stuttering related experiences in L1 and L2 as a monolingual and bilingual child (0-8 and 8+). The results allow us to describe the case and interpret for symptoms and the reasons for recovery from stuttering in L2 but not L1 in the context of her unique social, psychological and personal factors. We also describe the potential consequence of learning a second language on speech and language disorders, precisely stuttering. This case can shed some light on understanding the causes, development and recovery from stuttering.

Poster U67 – Haley Mumm

Mentor: Philip Lai

Title: Comparing and Contrasting Gender Differences in School-age Children with Autism Spectrum Disorders

Autism is defined on a clinical basis by impairments in social interactions, verbal communication, non-verbal communication, narrow interest and repetitive behaviors. The prevalence rate of Autism Spectrum Disorders (ASD) in the United States (1 in 59). Males are nearly four times more likely to be diagnosed than females. Studies suggest that males have a higher chance of diagnosis due to their lack of social skills, such as eye contact and social reciprocation, compared to their female counterparts. However, most studies do not focus on school-age children, where they tend to adapt skills that suppress these social deficits. This study will investigate whether school-aged children with ASD adjust to social rules or if they are delayed at this age. Since social pressures are heighten in school settings, this study will include children from the ages of 7 to 14, as they talk about their lives through a biographical interview. During this point in development, it is expected that children should be learning or have already gained a sense of social display rules. For this project, we coded body posture, eye contact, and hand movements in 14 children with ASD and 14 typically developing (TD) peers. Results found significant group differences in Body Posture ($p=.024$) as the ASD group moved more than their TD peers. In addition, Eye Contact ($p=.027$) was significant as the TD group produced more eye contact their ASD peers. These results suggest behavioral and social differences amongst school-age children when conducting an interview with an experimenter.

Poster U68 – Claire Neil

Co-Author: Kassidy Kirsch

Mentor: Philip Lai

Title: A Longitudinal Study Investigating the Communication between Parents and their Children with Autism Spectrum disorder

The importance of parent-child interaction for language development has been observed in children with developmental delays. One of the first signs of atypical development noted by parents of children with Autism Spectrum Disorders (ASD) is delayed language development. The purpose of this study is to explore the linguistic behavior of the caretaker as they interact with their child with ASD around 2.5 years of age and through this longitudinal investigation, re-examine the parents' behaviors each year until the child is around 5.5 years old. The dataset included 10 sets of mother-child pairs as they engage in a 15-minutes play session. Mothers were instructed to "play with your child as you normally would at home" before taping began. Two different types of toys were provided, as a student research assistant recorded the sessions. Coding of behaviors included gestures and speech output by the mother. Inter-rater reliability exceeded 85% agreement. Results for gestures showed the greatest gesture use by mothers at Visit 1 and leveled out in subsequent years. For speech output, mothers did not vary much throughout the four years. The drop of gesture use after the first visit may reflect the child's own development as they mature. Or reflect how the mother interacts with the child as the mother may be less inclined to choose the toy for the child to play with. Taken together, understanding more about how parents interact with their children at this critical age-range can lead to more refined treatment methods at the clinical level.

Poster U69 – Sarah Petersen

Co-Author: Jenilee Woltman

Mentor: Ladan Ghaz Saidi

Title: Developing a Bilingual Identifier for the Medical Setting

The prevalence of bilingual speakers in the US is growing (1, 2). Many bilinguals in the US are not as proficient in English (2,3). Bilinguals are often at a disadvantage at medical settings, where clear communication is necessary for quality care (3). When healthcare facilities fail to identify L2 speakers, their quality of care may be compromised (1). Further, bilingual brain functions differently from the monolingual brain (4, 5). This impacts the medical outcome in the context of neurological or neurodegenerative disorders (stroke, aphasia, dementia). Consequently, the assessment, diagnosis and treatment of bilingual patients may have to be tailored to their needs (5). This study aims to develop and pilot an efficient and rapid tool for identifying bilinguals via a survey created

on Qualtrics to eventually be used at medical settings. The survey is constructed from the literature as a simplified version of the Language Experience and Proficiency Questionnaire (LEAP-Q), an assessment frequently used in research and medical settings to test language proficiency (6), however, it takes over ten minutes, imposing a limit on care given. Conversely, an identifier should not take more than 2-3 minutes to complete, while remaining sensitive, accurate and reliable. To test the effectiveness of the simplified survey compared to the LEAP-Q, bilingual and monolingual participants will be recruited from UNK to complete the original LEAP-Q and the simplified version developed by the researchers. The results of the simplified survey will be compared to the LEAP-Q to determine if they are statistically equally reliable and comparable.

Poster U70 – Sophie Sawicki

Mentor: Whitney Schneider-Cline

Title: Electropalatography as a treatment option for clients with speech sound errors seeing minimal progress through traditional speech therapy: A comparison of case studies

This research project investigated the use of electropalatography, a personalized electronic device that fits one's palate to provide visual feedback for speech productions, as a productive addition to traditional therapy for clients presenting with articulation errors. Two case studies were conducted, which allowed for a comparison of similarities and differences in therapeutic outcomes to determine the effects of electropalatography (EPG). The first case study client, a ten-year-old female, presented with persistent /s/ articulation errors. The second case study client, a twelve-year-old male, presented with persistent /r/ articulation errors. Both clients had previously received extensive traditional treatment without generalization. During this study, each client received individualized therapy utilizing EPG. Each client, parent, clinician, and supervisor were interviewed throughout the duration of therapy using EPG. Each interview provided information about techniques used in therapy, feedback about the device, and personal observations from all parties. In addition, weekly treatment data was collected for each client across two semesters of therapy. Results from interviews revealed both clients indicated EPG assisted with placement for accurate productions of targeted speech sounds and both enjoyed therapy. Parents, clinicians, and supervisors also held positive viewpoints regarding EPG. They noted the progress made, generalization across settings, and overall better attitudes in both clients. A few concerns involved the timeframe that the client can use EPG (due to the development/growth of the oral cavity) and technological errors. Weekly treatment data indicated both clients made greater progress during therapy utilizing EPG than during traditional therapy alone.

Family Studies

Poster U71 – Jason Baker

Mentor: Sharon Obasi

Title: Lost In Transition: Female Veterans Education after Service

In the last two decades, few studies exist regarding female veterans transitioning from the military into higher education at either two or four year colleges. Using Schlossberg's Transition Theory, a life transition theory, and data from the Veterans Administration (VA), secondary data analysis suggests female student veterans are not taking advantage of resources and services that were designed for students. In general, female college students in the past have had more positive attitudes toward seeking help, especially for psychological challenges when compared to their male counterparts (DiRamio, Jarvis, Iverson, Seher, & Anderson, 2015). Research has determined that female veterans have a difficult time connecting to the campus (Heitzman & Somers, 2015). Military culture is predominately masculine and by allowing females to serve in previously male-only military occupation specialties some are now serving in direct combat alongside males. This project will show how the needs of female veterans are not being met by many two and four year colleges and explain how higher education institutions can better support female veterans during their transition, and while they are enrolled in college. This project has a significant impact not only on current female student veterans but also for those that will be transitioning out of the military and into classrooms in the future.

Poster U72 – Jamie DeBoer

Mentor: Chance Bell

Title: Examining the Effects Children with Developmental Disabilities Have on Parental Stress

Parents of children with special needs tend to experience significant amounts of stress. Therefore, they may have poor mental health outcomes (Huang, Chang, Chi, Lai, 2014) compared to those who have children without a child with special needs. The purpose of this study is to compare and determine the effect developmental disabilities of children have on parental stress and the extent of the effect overtime, and to those of parents who do not have a child with a developmental disability. We hypothesize that if the child had a disability, parents would be more likely to develop hypertension, depression, anxiety, and/or relational problems later on in life compared to parents whose child does not have developmental disabilities. Our study examines the potential effects of parental stress of having a child with a developmental disability by testing specific variables found in the Add Health Parent study. The study was a follow-up of the national longitudinal study of 966 parents ranging in the age from

50-80 years old. Using secondary analysis, we will look at the prevalence of hypertension, depression, anxiety, and relational problems. The parent's perceptions of their child having a disability in the original study will be statistically tested to determine if it predicted them to have the stresses later in life. The methodology used in the project will consist of a quantitative approach through the means of testing and examining statistical output and comparing it to previously published research to note any significant patterns. The researcher will draw conclusions about the hypothesis based on statistical results; and develop a presentation, and manuscript for submission to both a conference and scientific journal.

Industrial Technology

Poster U73 – Victoria Alvarado-Contreras

Mentor: Dana Vaux

Title: Aquaponics for Residential Use

Humans are drawn to nature. Without sun we get sad and the sound of rain gives us comfort. Understanding an aquaponics system provides a window to nature indoors when a window is not feasible architecturally, and can steer design into new ways of working with nature.

For this project, I searched for a way to grow foods indoors with a system that requires little effort, to understand how difficult it is to incorporate aquaponics into residential spaces and make use of their benefits. Building on an earlier research project, I designed a system to irrigate sprouts, provide natural nutrients, and simultaneously clean the aquarium.

I began researching typical aquaponics systems and using information from previous experiences. I began designing plans for the tank deciding on planters, plants, fish, and materials needed. Then, I addressed preexisting issues, such as, noise and rapid evaporation solved before assembly. Later, I ordered materials and began building. As problems came up, I redesigned as needed and continued. After the water could successfully navigate, I could begin the plant growing portion. I redesigned multiple pots and growing methods and after a batches of moldy seeds and broken planters, I was able to grow wheatgrass.

Today, there is a push for 'bringing the outdoors in,' for natural ways to light a room, and less focus on maintenance to do other things. A small scale aquaponics system can provide a way to interact with nature indoors, especially if set up and maintenance is manageable.

Poster U74 – Lois Corey

Mentor: Ahna Packard

Title: Virtual Simulation of Interior Environments

Virtual Reality is an up and coming technology in the interior design field. This technology is starting to be integrated into architecture and design firms. I focused on how light and color factored into how humans interact with a space. I created a 3-D health clinic model to walk through with my knowledge of Revit and other design software. I focused on the HTC Vive system and the abilities that this system holds. VR is seen as new and innovative because of its ability to interact with a space before it is physically built. Hopefully, this new wave of technology will be able to solve architectural issues and help clients visualize the space they are asking for. These systems are not easily accessible or user-friendly, as more is learned about it, the more it will be used. With more studies and use, VR systems will be used to see how clients interact with light and color in space.

Poster U75 – Molly Schultz

Mentor: Ahna Packard

Title: Virtual Reality: New Horizons for Interior Design

My purpose for this research project was to gain knowledge of how to use virtual reality systems to conduct simulation research, analyze outcomes, and problem solve through both technical skills and abstract innovation. I worked with my mentor in the fabrication lab to learn the software. I focused my attention to the Oculus Rift system and researched ways to enhance the design experience through the virtual reality world. I utilized my knowledge of Revit to explore my personal health clinic project in a 3D setting. The information attained by doing this research will help to solve interior and exterior architectural problems before it occurs in a real world setting. I created a set of instructions for the Oculus system that explains the basics on how to use the system as well as how to use it for design projects.

Kinesiology & Sports Sciences

Poster U76 – Reid Beilby

Mentor: Bryce Abbey

Title: Post-Exercise Hunger

Background: Timing of nutrient intake after a strength and conditioning workout is still a relatively new topic regarding the effects on health and body composition in adults. In 2008, the first position stand of nutrient timing was published by the International Society of Sports Nutrition (ISSN). Nutrient timing related to post-exercise needs has limited evidence that supports a specific timeframe or macronutrient that stands out to be better than others. Studies comparing protein intake every 3 hours for a 12 hour period to a randomly timed protein intake; neither method related directly to a difference in effectiveness or ineffectiveness of macronutrient consumption. The ISSN provides an objective and critical review of whether or not a nutrient timing strategy is beneficial and worth incorporating into one's diet. Nutrient timing is a broad and fairly new topic in sports nutrition,

with research and methods for post-exercise hunger as well as nutrient timing continuing to updated and improved upon.

Purpose: The purpose of this project is to collect and research current information and human subjects regarding their dietary intake methods and body composition and how they relate to nutrient timing after exercising.

Methods: This project will include completing CITI training, followed by gathering information from peer reviewed journals regarding nutrient timing, dietary intake methods, and body composition.

Results: Articles and human subjects are being analyzed

Poster U77 – Baylee Brownawell

Co-Authors: Stefanie Neal & Brady Roeder

Mentors: Megan Adkins, Nikolaus Stevenson, & Christine Cutucache

Title: The T.R.A.I.L to S.T.E.M. with Physical Activity (Teaching Responsibility and Independent Learning to Science, Technology, Engineering, & Math)

An estimated 1.7 million of all school age children in grades k-12th are currently being educated in the United States in a homeschool based setting (McQuiggan, Megra, & Grady, 2017). Although, homeschool children may have advanced cognitive knowledge in core academic courses, limited research has been completed about understanding of their own physical health and well-being. According to the CDC (2017), the prevalence of childhood obesity is at 18.5% in the US. As the need to educate children in all school settings about physical activity and health continues, to assist homeschool children in learning about exercise, an exercise science STEM lesson was created incorporating kinesthetic learning and physically active play strategies (PAPS). The combination of kinesthetic and PAPS has the potential for a homeschool age child to learn and retain information about STEM and increase interest in being physically active. The PURPOSE of the study was to evaluate student barriers to and knowledge of the science of exercise (STEM concept), and the importance to their health. METHODOLOGY: Students who selected to participate in the study completed a pre and post- test survey related to their understanding of basic health concepts and perceived barriers to exercising. The researcher taught a 55-minute lesson about exercise and wellness in relation to STEM. At the end of the lesson, students participated in a discussion related to their understanding of barriers to exercise, knowledge of the science of exercise (STEM concept), and the importance to their health.

Poster U78 – Morgan Daubert

Co-Author: Stefanie Neal

Mentors: Megan Adkins & Nikolaus Stevenson

Title: Understanding Pre-Service and First Year Teacher Perceptions and Knowledge of Social and Emotional Learning

Policy makers, school districts, and university faculty recognize the importance of addressing the social-emotional (SE) development of students' to assist with improving educational outcomes, and have begun implementing SE learning into classrooms (Banerjee, et. al,. 2014; Durlak, et. al, 2011). Although faculty and pre-service teachers acknowledge the need and benefit of SE development of children, due to university and state education mandates, and maximum credit hours available for teacher preparation, it is unknown if SE training is adequately preparing teachers from UNK. The PURPOSE of this study is to evaluate first year teachers, teacher candidates, and senior status education majors attending UNK and their understanding and comfort of implementing SE components into their classrooms. METHODS: 304 participants were contacted through the university teacher certification office at UNK, and asked to participate in the study. An online survey portal was used where participants were asked about their understanding of the five components of SE, if/where they learned how to teach SE skills to children, as well as comfort in implementing SE concepts in their own classrooms. Participants were provided three weeks to complete the survey. 185 first year teachers, teacher candidates, and senior status education students from 25 different education majors completed the survey, providing a 60.8% return. Data is currently being analyzed. The results of this study will offer insight into SE understanding and could be utilized by the UNK College of Education to determine areas to address in their curriculum related to SE learning and application for pre-service teachers.

Poster U79 – Jacalyn Kliewer

Mentor: Jacalyn Kliewer

Title: Types, Characteristics, and Outcomes of Effective Physical Activity Interventions Implemented on College Campuses; A Review of Systematic Reviews

Introduction: Regular physical activity is key in preventing chronic diseases and improving physical and mental health. Research shows physical activity declines throughout the college years. The purpose of this research was to identify and distill different intervention types, characteristics, and outcomes found in systematic reviews and meta-analyses focusing on increasing physical activity behavior among college students.

Methods: The terms "physical activity, exercise, intervention, and university" were searched in the psychINFO database. Search parameters included articles

published in the English language between 2009-2019. The reference lists of included reviews were also searched.

Results: The search strategy led to the identification of multiple publications. The focus of this research was centered on one systematic review and meta-analysis (2015), which focused on physical activity outcomes, one systematic review of systematic reviews (2019), which focused on intervention types and outcomes, and one systematic review (2018), which focused on intervention characteristics. Findings from each review were distilled and synthesized. It was found that only four interventions significantly increased physical activity behavior. More course-based and mixed (course-based and electronic) interventions were effective compared to other types of interventions. Implementation within a classroom setting on a college campus was a characteristic found in each effective intervention.

Discussion: Increasing physical activity among college students is important. This study distilled data from both qualitative and quantitative systematic reviews to synthesize intervention types, characteristics, and outcomes to provide future researchers and practitioners actionable information to develop future effective physical activity interventions for college students.

Poster U80 – Kevin Line

Mentor: Kazuma Akehi

Title: Effects of Vision Training on the Static Balance and Reaction Time for Collegiate Recreationally Active Individuals

Vision training has become the growing practice to improve demanding visual perception, cognition, and oculomotor tasks to consolidate athletic performance. Saccadic eye movement (SEM), smooth pursuit eye movement (SPEM) and vestibuloocular reflex (VOR) are eye movements and reflex, which are influential to static and dynamic balance. There are still limited researches on the training of SEM, SPEM, and VOR to improve their athletic performance, instead of the traditional strength and conditioning. The purpose of this study is to determine a correlation of SEM, SPEM, and VOR training on balance and hand-eye coordination. Twenty-four healthy recreationally active male college-aged subjects will be recruited. Twelve subjects will be randomly selected to the vision training and the others will be assigned in the control group. Balance scores and reaction time will be recorded during their baseline measurement, 4th-week follow-up, and 8th-week follow-up. The vision training group will experience the vision training and hand-eye coordination training for 8 weeks, consisting of a 15-minute training session, twice a week. The control group will not experience any training. Visual training consists of SEM, SPEM, and VOR included in the visual training video program and the hand-eye coordination training consists of pre-programmed training routine included in the Fitlight. The investigator hypothesized static balance and reaction time would decrease after the visual training and hand-eye coordination training. Incorporating visual training into the athlete's exercise routine to promote improvement in balance would be vital in sports due to consistent performance of eye movement, balance, hand-eye coordination, and tracking.

Poster U81 – Erin Marzolf

Mentors: Kate Heelan, Bryce Abbey, & Roderick Bartee

Title: Effectiveness of a Pediatric Weight Management Intervention Delivered by Specialists, Community Members or via Video Conferencing Methods

In the previous two decades, childhood obesity in the United States climbed from 13.9% to 18.5% for 6 to 12-year-old children (Hales et al., 2017). Pediatric weight management interventions (PWMI) have been developed and implemented in urban areas, however delivery of effective intervention in rural communities is less common. Purpose. To determine the difference in body composition after participating in an adapted 12-week PWMI when delivered by three methods in rural Nebraska. Methods. 28 children (mean age: 9.6 ± 1.9 years), with obesity (mean BMI percentile: 98 ± 2.4) were measured for body composition at baseline and after 12 weeks. Participants received nutrition, physical activity, and lifestyle modification education over 12 weeks from: (A) specialists who developed the program, (B) community members who received and delivered the curriculum, or from (C) specialists via video conferencing with local facilitators. Changes in body composition were compared between the three delivery methods for child participants. Results: Participants significantly decreased body mass, zBMI, and body fat in 12-weeks ($p<0.05$). There were no significant differences between delivery methods for any body composition change ($p>0.05$). Conclusion. Overall, participants in the PWMI significantly decreased zBMI which suggests effectiveness of the intervention. There were no significant differences in any of the body composition changes between the three delivery methods demonstrating effectiveness of the PWMI regardless of delivery method. Finding methods for delivery that reach more children in rural areas is warranted.

Poster U82 – Sophie Mellema

Mentor: Kazuma Akehi

Title: Effects of Deep Tissue Laser Therapy on Passive Joint Range of Motion and Musculotendinous Mechanical Properties

Context: Deep tissue laser therapy (DTLT) has been used for the treatment of various musculoskeletal conditions, aiming to control pain and facilitate to regeneration of the tissue. However, there is a need to study how much passive tissue mechanical resistive properties and joint

range of motion (ROM) will change after DTLT. *Objective:* The purpose of this study is to examine if a 4-week of DTLT sessions influences passive musculotendinous stiffness (MTS) and ROM for the hip extensor groups comparing to the sham laser treatment group (SLT). *Study Design:* Factorial study will be used. *Participants:* Twelve recreationally active college-aged people will be recruited. Each participant should have a chronic hamstring tightness yet have no known musculoskeletal injuries in the dominant side of the leg in the last 6 months prior to the data collection. *Procedure:* Passive hip flexion ROM and MTS will be measured using the isokinetic dynamometer at two different times (pre- and post-therapy session). Participants who are randomly assigned to the DTLT group or SLT group will experience a treatment twice weekly for 4 weeks. Following the 4-week treatment session, participants will be back for the follow-up assessment. We hypothesize that DTLT will allow a greater increase of ROM and less MTS compared to the SLT group. *Clinical Application:* The results of this study can provide better clinical insights of the modern laser therapy to improve the joint ROM by means of decreasing MTS.

Poster U83 – Jarod Micek

Mentor: Kazuma Akehi

Title: Effects of Explosive Plyometric Training vs Weight Lifting on Postural Balance and Rapid Muscle Strength Characters.

Background. Many previous studies examined the postural balance and explosive muscle strength characters utilizing the knee extensors and/or knee flexors muscle strength. The posterior thigh muscles such as hip extensors, including the hamstrings, have been reported to be a key athletic performance contributor during running, cutting, and jumping. However, we are unaware of any previous studies that have investigated the ability of postural balance and explosive muscle strength characters after the explosive plyometric training. *Objective.* The purpose of this study is to determine whether an 8-week strength training program, or an 8-week explosive plyometric training program increase the postural balance and rapid isometric torque characteristics of the hip extensor muscles. *Participants.* Thirty-six recreationally active college-aged individuals with no known musculoskeletal injuries will participate in this study. Each participant will be randomly assigned to 1) explosive plyometric training group, 2) traditional weight training group, and 3) control group. *Procedure.* Postural balance measurement will be taken using the Star Excursion Balance Test (SEBT) and Biodex Balance System. Muscle peak torque and rate of torque development (RTD) will be examined during each voluntary muscle contraction. After the baseline measure, each participant will experience an 8-week training program. The post-training measure will be taken place after the completion of the training program. *Hypothesis.* We hypothesis that both exercise training programs will improve the participants balance scores from the baseline scores. *Clinical Application.* The current study will provide the opportunity to contribute to improve their rapid hip and knee activation during dynamic maneuvers.

Poster U84 – Carleigh Novack

Mentor: Scott Unruh

Title: Effects of Anterior Cruciate Ligament Reconstruction Surgery/Rehabilitation on Post-Surgery Knee Functionality

An anterior cruciate ligament tear is common among collegiate athletes and the recreationally active population. This injury nearly always prohibits the activity for participants for an extended period of time. As this population of people goes back into the world to work a job as an adult, an improperly rehabilitated knee can affect quality of life, physical activity level, and even their home life. The purpose of this research is to find any correlation between the types of ACL repairs, the rehabilitation methods used, and the subject's current quality of life such as knee functionality.

To accomplish this, I will pair with New West to find patients who underwent ACL repairs and post-surgery rehabilitation. Information will be gathered through mail out surreys with questions on how they are functioning in their daily lives at one, five, and ten years after. After I have gathered the information I will try and see if I can find a correlation between the types of ACL repairs done, or the rehabilitation methods and the subject's current quality of according to knee functionality.

Poster U85 – Caden Picquet

Mentor: Richard Gage

Title: Assessing Campus Sustainability at the University of Nebraska at Kearney

Sustainability has been an issue of growing concern for decades, but only recently has a focus been placed on sustainability on college campuses. Research suggests that universities can play a critical role in developing environmental responsibility among students that extends beyond the college years. As such, a growing number of campuses are developing and adopting sustainability programs to address the need for awareness and advocacy. UNK is no exception; In 2015, UNK developed a Sustainability Master Plan that outlined plans for achieving key goals by the year 2025. To date, little progress has been made in many regards. Since 2015 there have been no updates or progress recorded in regard to the initial findings.

To find where we stand now as a university a literary review will be conducted, followed by further analysis to see where we stand as a university. Topic areas of study will include water consumption, energy usage, waste

production, green purchasing, mobility to and around campus, emissions, developing education on sustainability across all disciplines, and campus culture and engagement. After reviewing the literary review and updating base line data for UNK's campus sustainability topics we will then develop a plan for the next phase of research.

Poster U86 – Hannah Sealock

Mentor: Scott Unruh

Title: Outcome Measures for Post-Surgical ACL Rehabilitation

Context. Injury to the anterior cruciate ligament (ACL) is a common injury for athletes to endure. The prevalence of this in the United States is around 200,000 cases per year (Cerulli et al., 2013). *Objective.* The purpose of this study was to examine the post-operative outcomes for rehabilitation following ACL repairs. *Setting.* Orthopedic outpatient clinic. *Participants.* Historical data from 31 patients that had surgery and completed physical therapy from 2010 to 2016 was reviewed. This study included 19 males and 12 females, and the average age was 25.81 ± 8.39. Only participants who had an ACL reconstruction done using a hamstring tendon autograph were used. Surgery procedures may have also included partial meniscectomy. *Interventions.* The injury type, repair type, and rehabilitation techniques assessed are all completed prior to collection of data. Historical data was recorded from patient files and coded in Microsoft Excel with aid from a physical therapist. Any data that could identify a patient was not included in the recorded data. Patient charts were studied to provide the type of injury and surgical repair, the therapist's notes from each rehabilitation session, the flow sheet of exercises used during rehabilitation, and the main physician with notes from each evaluation. The patients were separated into two different groups based on their injury and repair type: (1) ACL repair with hamstring tendon (n=16); (2) ACL repair with hamstring tendon accompanied with a meniscectomy (n=15). *Results.* Overall, the average number of visits was 36.10 ± 11.60 visits. All patients significantly ($p<0.05$) increased flexion throughout therapy (132.68 ± 8.20°). There was a significant ($p<0.05$) difference in final and change in range of motion between the two groups. Running and walking program starting time was not determined by the injury and repair type. *Conclusions.* Patients who had a partial meniscectomy saw a much greater change in range of motion. Amount of resistance for each exercise was based on a number of factors including age, gender, motivation, and exercise status pre-injury.

Poster U87 – Nathan Slusarski

Mentor: Bryce Abbey

Title: The Relationship Between Functional Range Conditioning and Athletic Performance

Background: Athletes are continually looking for ways to gain an edge on their competition, one relatively new method is through mobility training. Mobility, although similar to flexibility, includes more than range of motion. Mobility includes the ability to stretch in a motion related to sport-specific movement. Specifically, programs are being introduced around an idea referred to as Functional Range Conditioning. Functional Range Conditioning is a combination of joint health and mobility training. Research has proven that testing for functional range of athletes can foresee the susceptibility of athletes getting injured. They can use a test known as the Functional Movement Screen to compare the relationship of prior test scores and risks of injury (Garrison et al. 2015). Other experiments have shown to have various relationships with functional movement testing and athletic performance. The current project will evaluate the current literature as it relates to range of motion, flexibility benefits for athletes and the relationship of mobility and sports performance.

Purpose: The purpose of this project is to gather and analyze research articles about the relationship between functional range conditioning assessments and athletic performance. Information from present articles will be utilized to help create ideas and procedures in future research due to the experimental limitations.

Methods: The project will include the gathering of scholarly, peer reviewed articles on flexibility, range of motion and mobility through various research databases. Each article will be analyzed to find gaps, limitations, and future research plans.

Results: Present research articles are currently being gathered and analyzed.

Poster U88 – Katelyn Unvert

Mentors: Matthew Bice, Thomas Orr, & Richard Gage

Title: Athletic Identity

Many adults fail to meet the minimum recommendations for regular physical activity. This includes moderate and vigorous activity (USHHS 2008 Physical Activity Guidelines for Americans, 2014). Physical activity is defined as using skeletal muscles to move body parts and the energy expended is higher than normal (Caspersen, Powell, & Christenson, 1985). The definition of athlete can be confusing as well as who it all pertains to. The term is being used more frequently within the adult population. It can be hypothesized that being able to call/ not call oneself an athlete may play an important role in one's self perception. No current literature exists that examines the relationship of adults physical activity levels and identifying as an athlete. Further, limited literature exists that explores the

role motivation plays in explaining athlete identification. The purpose of this study is to compare, a) physical activity levels b) psychological need satisfaction c) Athletic Identity Questionnaire.

Poster U89 – Kelly Von Seggern

Mentor: Kazuma Akehi

Title: Effects of Repeated Subconcussive Impacts on Neuromuscular Function of the High School and College Student Athletes

Background: Contact sports are at higher risks of sports related concussions. Cognitive and neuromuscular function are affected by head trauma which could lead to memory loss, decreased attention, reduced reaction time, and poor balance. There is limited research on how season long contact sports participation influences athletes' cognitive and neuromuscular functions due to repeated subconcussive impacts to the head. *Purpose*: The purpose of this study is to examine the effects of repeated subconcussive impacts on eye movement, saccades, balance, and reaction time in high school and college women's soccer players. *Methods*: High school and college athletes will be recruited to measure reaction time using a FitLight unit, static balance using mCTSIB protocol on a Biodex Balance System and complete a King-Devick test to measure eye movement, attention, and speech function. Inclusion criteria include no head or neck trauma, loss of sensation or muscle function, or surgery to upper or lower extremities in the past 12 months. Assessments will be performed a total of 4 times separated by 4 weeks through their athletic season. *Hypothesis*: We hypothesized that reaction time, balance, and eye movement will decrease as the season progresses due to fatigue and/or subconcussive impacts to the brain that alter cognitive and neuromuscular function. *Clinical applications*: The findings from this study will help clinicians become aware of neuromotor changes through the season and how it influences their athletic performance.

Poster U90 – Taylor Wilson

Mentor: Gregory Brown

Title: Evaluating Energy Expenditure and Heart Rate during High Intensity Interval Cycling Compared to Treadmill Exercise

A currently popular form of aerobic exercise session is High Intensity Interval Training (HIIT), in which the person will exercise at a low to moderate intensity for a few minutes and then exercise at a high intensity for 30 seconds to 1 minute and then return to the low or moderate intensity for a few minutes. Few studies have looked at the physiological effects by comparing HIIT training on a treadmill and HIIT training on a stationary bicycle. Furthermore, measuring heart is one of the most commonly used ways to monitor physiological responses to exercise, but heart rate monitors may lose accuracy due to changing exercise intensities. The main purpose of this study is to determine if the acute physiologic response to HIIT on a treadmill and a stationary bicycle are equal when the power output during the modes of exercise is the same. The second purpose of the proposed research is to evaluate the accuracy of a Polar Electro Optical Heart Rate Monitor during the HIIT training sessions.

Management

Poster U91 – Jesse Gabriel

Mentor: Michelle Fleig-Palmer

Title: Tackling Surprise Billing to Benefit Policymakers and Patients

Surprise billing is when an insured individual receives healthcare services from a hospital or physician that is out-of-network and the bill is higher than expected. Several high-profile articles about surprise billing, e.g., Drew Calver charged $100,000 after a heart attack (Terhune, 2018), have propelled surprise billing to a national issue. To address surprise billing, New York passed legislation in 2015 (Kliff, 2019), New Jersey in 2018(Neill, 2018) and NE State Senator Morfeld introduced a bill, LB569, to combat surprise billing (Hammel et. al., 2019)

Some researchers and policy makers believe that transparency of medical costs will address the problem of surprise billing (Daly, 2018). While not incorrect, this demonstrates a limited perspective on the issue. Transparency can lead to patients' understanding where they can receive reasonable priced care and to lower costs as a result of competition. Problems arise, however, if a patient is receiving care from a physician who is out-of-network at an in-network hospital. Transparency will not be effective for the patient. Even in a state such as Texas where surprise billing legislation already passed, there are still loopholes. For example, Drew Calver's employer was self-insured, so the Texas legislation did not help him (Terhune, 2018). Several state legislatures have passed limited surprise billing legislation, without accounting for the loopholes. To address this gap, I will present a literature review of surprise billing and current legislation addressing it.

Undergraduate Performance Schedule

Sandhills Room

1:30 pm .....Hunter Scow
DI\vin/E; the Prelude to Paradise
Mentor – Noelle Bohaty

1:45 pm ..... Mary Storm
Examining "The Diaries of Adam and Eve" through Dramaturgical Analysis and Embodied Research
Mentor – Noelle Bohaty

Undergraduate Performance Abstracts

Music, Theatre, and Dance

Hunter Scow

Mentor: Noelle Bohaty

Title: DI\vin/E; the Prelude to Paradise

DI\vin/E; the prelude to paradise, is a modern dance piece exploring the parallels between paradise and hell (suffering and salvation). While not directly correlated to religion, the piece pulls much of its inspiration from religious themes and ideals. The primary inspiration comes from Dante Alighieri's poem, *the Divine Comedy*. Now, Alighiri's *Divine Comedy*, at times comes off as very political. Due to where my research has taken me, I chose to ignore the more politically driven themes found in the poem. This piece is about what comes next. Where does the body go when it leaves this plane of reality? I have come to think that heaven and hell are not as black and white as being a physical place one aspires to reach one day but rather, experiences one encounters through life. Whether or not a given situation is salvation or suffering, is completely based on how the person views the situation. The dance peers into ideas of loneliness and confusion primarily by how the movement is manipulated in juxtaposition with the negative space. *DI\vin/E; the prelude to paradise*, takes a look at the inevitable ending, tilts it on its head, and peers through rose tinted glass at the wreckage.

This piece includes four sections of movement starting in a place inspired from the dark wood, and ends in a hell-like paradise our poet has found. Performance of the entire dance will be in the UNK Studio Theatre in the Fine Arts Building on April 4th at 7:30pm and will be presented alongside another students' undergraduate work. The evening event will be called *Beyond Paradise.*

Mary Storm

Mentor: Noelle Bohaty

Title: Examining "The Diaries of Adam and Eve" through Dramaturgical Analysis and Embodied Research

This research project examines the theatrical one-act script "The Diaries of Adam and Eve" adapted by Ron Fitzgerald, as well as the original Mark Twain text by the same name and appropriate biblical references, with the goal of combining concepts from dance composition and playscript analysis to create a final dance work to be performed on April 4th in the Fine Arts Building Studio Theatre. This work entitled *Losing Eden; or Wherever you are…* will be performed alongside Hunter T. Scow's *DI\vin/E*: the prelude to paradise to create an evening of inspired work with the conjoined title B*eyond Paradise. Losing Eden; or Wherever you are…* examines the different perspectives of the story of Adam and Eve and the fall of humanity, both in terms of presentation and basis of information. Dance allows one to convey the same emotional information that a script or written story presents, in a completely different format. By examining different versions of the same story, one can find equally different emotional qualities and choose which are the most important to portray in order to create a work that is both integral of the source material and understandable to the viewer. The script "The Diaries of Adam and Eve" presents several different contrasts, for example, comedic vs. serious, good vs. evil, and loneliness vs. companionship. All of these concepts tell the story. The overall objective of this research project is to do the same, but in the combination of dance and theatre.

Undergraduate Oral Presentation Schedule

Ponderosa C

1:30 pm ..... Tatiana Moore
Retracing Old Lines: The Story of World War II Correspondence to the Doane Family of Bayard, NE
Mentor – Jeff Wells

1:45 pm ..... Mitch Robey
Retracing Old Lines: The Story of World War II Correspondence to the Doane Family of Bayard, NE
Mentor – Mark Ellis

2:00 pm ..... Mallory Hays
Phylogenetic Placement of Monochilus (lamiaceae) within the Subfamily Ajugoideae
Mentor – Bryan Drew

2:15 pm ..... Kennedy Kluthe
Investigating Staphylococcus aureus Tolerance to Innate Immunity
Mentor – Austin Nuxoll

2:30 pm ..... Emily Laub
Identification of Variable Gene Regions to Estimate Genetic Diversity within and between Northern Gashawk Populations in Finland
Mentor – Letty Reichart

2:45 pm .....Sydnie Lowery
Effect of Food Deprivation on Anxiety-Like Behavior in Mice
Mentor – Nicholas Hobbs

3:00 pm .....Emma Raders
Hybridization within Turkish Salvia
Mentor – Bryan Drew

3:15 pm .....Kaitlyn Schultis
Effect of Dietary Protein Content on the Response to Over-Marks and Androgen Receptor Expression in Mice
Mentor – Nicholas Hobbs

3:30 pm ..... Tara Buettner
Glyphosate and AMPA Extraction and Quantification from Soil Samples using LC-MS
Mentor – Annette Moser Lintz

Ponderosa D

1:30 pm ..... Lydia Behnk
Educational Reforms: The Democratic Theory
Mentor – Diane Duffin

1:45 pm ..... Kylie Johnson
Impacts of Provider Trustworthiness on Adult Vaccination Adherence
Mentor – Michelle Fleig-Palmer

2:00 pm ..... Seth Taylor
Attitudes & Perceptions of UNK Study Abroad Programs
Mentor – Greg Broekemier

2:15 pm ..... Gamaliel Montero Alcaraz
Prime Distribution between Consecutive Powers
Mentor – Jia Huang

2:30 pm .....Dakota Waddell
The Effect of Yoga Versus Mindful Meditation on Stress and Anxiety in Physically Active and Non-Physically Active Female College-Aged Students
Mentor – Gregory Brown

2:45 pm .....Nia Station
Mindfulness in Athletes
Mentor – Thomas Orr

3:00 pm .....Lupe Perez
Midwest Ethnic Minority Educators: The Good, the Bad, and the Ugly
Mentor – Martonia Gaskill

3:15 pm ..... Rochelle Hazelton
A Gift of Love and Friendship: Zwei Geange, Op. 91 by Johannes Brahms
Mentor – Anne Foradori

Undergraduate Oral Presentation Schedule

NSU 310

1:30 pm ..... Braydon Conell
Stitched Together: How Media Bias Affects Immigration Perceptions
Mentor – Satoshi Machida

1:45 pm ..... Erin Green
Classical Republican Virtue and Mary Wollstonecraft's Republican Virtue
Mentor – Diane Duffin

2:00 pm ..... Samantha Grieser
Party Polarization in House Committees During the 1993 Health Care Act
Mentor – Diane Duffin

2:15 pm ..... Makenzie Peterson
Literature Review on the Gender Balance within Curriculum and Classroom
Mentor – Diane Duffin

2:30 pm ..... Haley Pierce
Press independence in a partisan environment: A comparative analysis of U.S. news coverage of the Kyoto Protocol, American Clean Energy and Security Act, and Paris Climate Agreement
Mentor – Chuck Rowling

2:45 pm ..... Michael Rohde
False Balance in Journalism: Public and Government Language during the withdrawal from the Paris Climate Accords
Mentor – Chuck Rowling

3:00 pm ..... Cy Cannon
Evaluation of the Moth Effect: Myth or Valid Psychological Phenomenon
Mentor – Bill Wozniak

3:15 pm ..... Abigail Borgman
Effects of Essential Oils on Anxiety, Mood, & Task Performance: Lavender and Peppermint
Mentor – Krista Fritson

3:30 pm ..... Daniel Vargas Castano
The Current Parking Problem at UNK
Mentor – Frank Tenkorang

NSU 312

1:30 pm ..... Shushant Khanal
Big Data as a Tool to Fight Against Human Trafficking in Nepal
Mentor – Sharon Obasi

1:45 pm ..... Megan Gifford
Paul and Parzival Prevail: Frank Herbert's 'Dune' as Grail Quest
Mentor – Rebecca Umland

2:00 pm ..... Tyler Jacobs
Portraits in the Glass
Mentor – Tyler Jacobs

2:15 pm ..... Kayla Wentz
Percy Bysshe Shelley: A Revisionist of Dante Alighieri
Mentor – Rebecca Umland

2:30 pm ..... Alex Geweke
Assessment of Tick-Borne Pathogens in Central Nebraska (Tri-City Area) in 2019
Mentor – Julie Shaffer

2:45 pm ..... Clarissa Fitzgerald
The Prevalence of Borrelia Lonestari in Central Nebraska
Mentors – Julie Shaffer, Travis Bourret, & Brandon Luedtke

3:00 pm ..... Miriam Nieto
The Cherokee Syllabary: The History and Re-emergence of a Native American Writing System
Mentor – Christopher Steinke

3:15 pm ..... Macey Stall
The Diaries of Verna
Mentor – James Rohrer

Undergraduate Oral Presentation Abstracts

Accounting, Finance & Economics

Daniel Vargas Castano

Mentor: Frank Tenkorang

Title: The Current Parking Problem at UNK

Parking is a problem across universities around the world, and the University of Nebraska at Kearney is no exception. The parking problem at universities follow the same principle: there are more people who want to park than available parking spots. Many years ago, UNK took a step in the right direction by starting charging for parking, but instead of using prices to allocate parking, UNK placed parking zones. The parking permit and zone policy did not address the main problem of parking scarcity and might have made things worse. The parking problem at UNK is old news and has been around for a long time. However, before trying to solve the problem with expensive solutions, such as building more parking or parking garages, other methods should be considered. This paper uses Shoup's ideas to improve the parking problems at UNK and identifies the parking problem at UNK. It is necessary to understand the demand for parking at UNK to assess the current parking situation, so a survey of the parking behavior at UNK is done. The results of the survey will give the data to analyze the current parking situation and to apply Shoup's ideas. My hypothesis is that the real parking problem is the misallocation of parking rather than the lack of parking. People at UNK are competing for the same parking spot when other places are available. The way to improve this would be to have variable parking prices that depend on location and time of day.

Biology

Clarissa Fitzgerald

Co-Author: Caitlin Ingram

Mentors: 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 B*orrelia 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.

Alex Gewecke

Mentor: Julie Shaffer

Title: Assessment of Tick-Borne Pathogens in Central Nebraska (Tri-City Area) in 2019

Ticks can live all over the world and feed off humans and other vertebrates. They can transmit pathogens that cause both chronic and life-threatening tick-borne illnesses (TBIs) but are less likely to do so if they are removed shortly after the bite. Reported cases of TBIs is on the rise in the US for a variety of reasons potentially including climate change, and many cases likely go undiagnosed. Symptoms of TBIs include fever, headache, and rash, and many new TBIs are being discovered. Blacklegged/Deer Ticks *(Ixodes scapularis)* transmit *Borrelia burgdorferi*, which cause Lyme Disease and are now established in limited areas of Nebraska, while Dog Ticks *(Dermacentor variabilis)* and Lone Star Ticks *(Amblyomma americanum)* both transmit several TBIs and are the first and second most abundant

ticks in the state, respectively. *A. americanum* have rarely been found infected with *Borrelia* species and may be implicated in Lyme Disease cases in Nebraska. Therefore, 221 adult ticks were collected within the tri-city area of Nebraska. 168 were identified as D. variabilis (80 males, 88 females), 52 as A. americanum (26 males and 28 females), and one female *Amblyomma maculatum*, which transmit *Rickettsia parkeri*. Their range is expanding and may or may not be established in Nebraska. DNA was extracted from each individual tick (minus the A. maculatum) using the Winged Genomic DNA extraction kit. PCR and gel electrophoresis are currently underway to identify pathogenic bacterial DNA. Positive DNA samples will be sent to the UNMC Genome Core for sequencing.

Mallory Hays

Mentor: Bryan Drew

Title: Phylogenetic Placement of Monochilus (lamiaceae) within the Subfamily Ajugoideae

The Lamiaceae (mint family) has about 7000 species, is found virtually worldwide, and is subdivided into 12 subfamilies. Ajugoideae is the third largest subfamily of Lamiaceae, occurs on every continent, and includes 23 genera and about 760 species. Previous studies have largely clarified relationships within Ajugoideae, but the genus *Monochilus* has never been included in a molecular phylogenetic study. *Monochilus* is made up of only two species endemic to eastern Brazil: *Monochilus gloxinifolius* and *M*. obovatus. Based on morphological features, it is predicted that the closest relative of *Monochilus* is the South American genus *Amasonia*. Here, we extracted DNA of *Monochilus* from dried leaf material, amplified targeted gene regions via PCR, and, for the first time, use a molecular phylogenetic approach to determine the phylogenetic placement of *Monochilus* within the subfamily Ajugoideae.

Kennedy Kluthe

Mentor: Austin Nuxoll

Title: Investigating Staphylococcus aureus Tolerance to Innate Immunity

Staphylococcus aureus is responsible for a multitude of infections, varying from minor skin and soft tissue infections to more complicated illnesses such as bacteremia and endocarditis. A major issue surrounding *Staphylococcus aureus* infections is their ability to become reoccurring. Recurring *S. aureus* bacteremia occurs in 10% of patients and can be as high as 15%, despite the use of antibiotics. Many of these infections are mediated by biofilms which are a community of bacteria adhered to each other and a surface through extracellular matrix. Furthermore, these biofilm-mediated infections are notoriously difficult to treat. The difficulty in treating these biofilms is thought to be mediated by persister cells. Persister cells are dormant cells that have lower intracellular ATP from decreased tricarboxylic acid (TCA) cycle activity. Previous experiments showed that a knockout in the TCA cycle gene, *fumC*, had a higher tolerance to antimicrobial peptides, a part of the body's innate immune system. To investigate differences in survival and immunogenicity of the *fumC* knockout, a mouse model of a catheter mediated biofilm was used. Upon the completion of these experiments we found that there was a greater M2 response in comparison to M1 response for the saline control, HG003, and *fumC* knockout strain. M2 responses are more often associated with persistent infections while M1 responses are more often associated with clearance of the pathogen. Additionally, we found that the bacterial burden levels in the tissue were about the same for HG003 and *fumC* knockout without antibiotic treatment. However, with antibiotic treatment there was a significantly higher bacterial burden in the *fumC* knockout with vancomycin in comparison to the HG003 with vancomycin. Upon further evaluation of bacterial burden levels, we found the same trend in the bacteria levels in the heart. Collectively, this data shows that the *fumC* knockout strain is better able to survive in living models in comparison to HG003 in the presence of vancomycin. The data also shows that the mice's immune system had greater difficulty clearing the *fumC* knockout infections even with vancomycin once they had reached varying organs. One explanation for this finding is that when the bacteria cells are in a dormant-like state, the binding sites for the antibiotics are no longer active and consequently prevents the antibiotics from effectively killing the bacteria. Along with the decreased effectiveness of the antibiotics, these persister cells may also be able tolerate components of the innate immune system as the *fumC* knockout was able to survive better outside of a biofilm as indicated by bacterial burden within the heart. Further work is needed to differentiate what components of the immune system persisters are able to tolerate leading to a persistent infection.

Emily Laub

Mentor: Letty Reichart

Title: Identification of Variable Gene Regions to Estimate Genetic Diversity within and between Northern Gashawk Populations in Finland

Estimating genetic diversity and population structure of species is important for understanding evolutionary and geographic history for specific populations. The purpose of this study is to determine genetic diversity and population structure of Northern Goshawks (Accipiter gentilis), in Finland. We extracted DNA from molted goshawk feathers, then amplified variable gene regions (microsatellite loci, non-coding regions of DNA) to determine genetic diversity present in goshawks from Finland. We have identified four

genetic loci that are variable in our goshawk samples. The next step in this project is to amplify each genetic locus for multiple individuals from different populations in Finland. Finally, we will determine population genetic structure for goshawks in Finland and estimate genetic diversity within and between the goshawk populations in Finland. This information will be compared to genetic diversity observed in Japanese, central Asian, and Utah populations of goshawks to estimate genetic similarity across multiple geographic populations of this species.

Sydnie Lowery

Mentor: Nicholas Hobbs

Title: Effect of Food Deprivation on Anxiety-Like Behavior in Mice

Anxiety symptoms are associated with disturbances of the emotional centers of the brain, such as the amygdala, and can cause behavioral changes. Many behaviors, including anxiety-like behaviors displayed by animals, are affected by its nutritional state. An animal's nutritional state consists of both the quality of food available and the amount of food available. Food deprivation of 24 hours has been shown to alter reproductive behaviors in rodents. As such, it is possible that it may also affect anxiety-like behaviors. Subjects for this experiment are wildtype males, wildtype females, and testosterone feminization mutant mice, which are male mice that lack a functional androgen receptor (AR) due to a mutation, who are tested for anxiety-like behavior using an elevation plus maze (EPM). We predicted that food-deprived mice would spend a greater percentage of time in the closed arm of the EPM relative to mice that had continuous access to food. Preliminary data support this prediction. We also predict changes in neural activity in food-deprived mice in brain regions associated with anxiety, such as the amygdala.

Emma Raders

Mentor: Bryan Drew

Title: Hybridization within Turkish Salvia

Salvia is one of the most commonly occurring genera of flowering plants, with about 1000 accepted species. *Salvia* thrives in China, Mexico, South America, and Turkey. Turkey is the second most diverse region for *Salvia* due its topographic diversity and dry climate. The high diversity of *Salvia* within Turkey affords ample opportunity hybridization, however few hybrids have been recognized. Here, we examined two putative instances of hybridization between species of *Salvia* in Turkey, neither of which has previously been documented.

Kaitlyn Schultis

Mentor: Nicholas Hobbs

Title: Effect of Dietary Protein Content on the Response to Over-Marks and Androgen Receptor Expression in Mice

In both humans and rodents, males outperform females in tasks measuring spatial memory, suggesting a role for gonadal steroid hormones. A rodent's ability to discriminate between the top- and bottom-scent donors of an over-mark is an example of spatial memory. Previous research has indicated that meadow voles fed a low-protein diet or that have been food-deprived spend similar amounts of time investigating the scent donors of an over-mark. Interestingly, these treatments also result in lower estradiol levels in female voles. However, it is unclear if this lack of preference associated with dietary changes is due to cognitive defects linked to the diet or decreased interest in opposite-sex conspecifics due to lower gonadal hormone levels. Therefore, this study tested the hypothesis that the protein content of the diet affects an individual's spatial memory in a mouse model that lacks androgen receptors (AR). Mice were fed either a high- or low-protein diet for 30 days and then exposed to an over-mark to test spatial memory. Brain activity in response to over-mark exposure was determined by measuring c-Fos expression in brain areas associated with both spatial memory and processing olfactory signals, such as the hippocampus and medial amygdala. AR expression was also measured in these areas. We predicted mice fed a high-protein diet will show a top-scent preference and express higher levels of c-Fos and AR in the measured brain regions. This would suggest that protein content of the diet works through AR to modulate spatial memory.

Business Education

Lydia Behnk

Mentor: Diane Duffin

Title: Educational Reforms: The Democratic Theory

Throughout the history of education, reforms have shaped the way the classrooms operate. Two of these reforms—the democratic educational reform and the neoliberal education reform—are vastly different approaches. The purpose of this research is to compare the democratic and neoliberal education reforms. The latter reform—neoliberal education—prepares students for the workforce as opposed to the democratic theory's focus on critical thinking. As a future business teacher, I must be able to prepare my students for the workforce while keeping democracy at the heart of education. To understand how best to do so, I will be reading texts from the theorist of both reforms and constructing literature reviews to delve into each theory and compare the various aspects of the two reforms. Each theorist's opinion of how the respective

reforms should be demonstrated in the classroom will be investigated and cross-examined with other theorist's views of the same reform. As a future educator, this research is significant because teachers must be aware of what reforms and methods will best prepare students for their futures. This research will evaluate the reforms and help conclude if we are headed in the right direction or if we are straying further from the true purpose of education.

Chemistry

Tara Buettner

Co-Author: Kenneth Ernest

Mentor: Annette Moser Lintz

Title: Glyphosate and AMPA Extraction and Quantification from Soil Samples using LC-MS

A method capable of detecting glyphosate and its major metabolite, aminomethylphosphonic acid (AMPA) was developed for the quantification of glyphosate in soil samples. Isotopically labeled glyphosate was added as an internal standard prior to extracting the samples. After extraction, a benchtop derivatization reaction with 9-flourenylmethyl-chloroformate (FMOC) was used to label the glyphosate and AMPA prior to LC-MS analysis. Glyphosate, isotopically labeled glyphosate, and AMPA were quantified separately based on m/z ratios of 392, 394, and 334; respectively using the positive ion mode. Detection limits of less than 0.1 mg/kg soil for both AMPA and glyphosate were obtained. Total glyphosate concentration is reported as the combination of these amounts and resulted in a linear calibration curve with a range of 0.1 – 20 mg/kg for spiked soil samples. Additional method development to obtain even lower limits of detection is currently in progress.

Cyber Systems

Shushant Khanal

Mentor: Sharon Obasi

Title: Big Data as a Tool to Fight Against Human Trafficking in Nepal

On the laps of the Himalayas, lies the country of Nepal that is smaller than the state of Nebraska. With the population of nearly 29 million people according to the 2011 A.D. census, the country is well diverse in terms of culture where 123 different languages are spoken, and 126 different castes are present. Although gifted naturally and culturally, most of the Nepal is composed of rural areas. In fact, only 17% of the country is urbanized meaning that most parts of the country is still behind in infrastructural development. As a result, the problem of human trafficking is prevalent in those parts of the country. Sex trafficking along with child labor and labor exploitation are some of the biggest issues of human trafficking which has resulted in being a big hindrance in the path of development. The government is trying its best to resolve the issues regarding human trafficking but most of the plans and policies put in place by the government are either not implemented to their fullest potential or only serve after the crime has taken place. This is where the idea of big data comes in as big data, in general terms, is the process of collecting large amount of data from the past and processing it with the help of machine in order to find a common pattern. The idea of big data is not new in developed countries, so this project works on finding the potential of big data in countries like Nepal by comparing the situation with developed nations that are already using it. Secondary source of data will be used for data collection for major parts whereas primary source might be used if necessary.

English

Megan Gifford

Mentor: Rebecca Umland

Title: Paul and Parzival Prevail: Frank Herbert's 'Dune' as Grail Quest

"Paul and Parzival Prevail" utilizes archetypal criticism to analyze Frank Herbert's Dune (1965). Dune is examined as a grail quest and related to Wolfram von Eschenbach's Parzival (c.a. 1200-1210). Joseph Campbell's monomyth, in particular, Campbell's Romance of the Grail: The Magic and Mystery of Arthurian Myth (2015) is used to compare the quest structure of Herbert's modern science fiction novel to the quest structure of Wolfram's medieval romance. Both quester figures go through Separation, Initiation, and Return, Campbell's three main stages of the monomyth. Richard Barber's The Holy Grail: Imagination and Belief (2004) is used to examine symbols of election and common elements of the Grail quest. Both Paul and Parzival display symbols of election. For example, Parzival is connected to knighthood through his mother and Paul is connected to the Bene Gesserit through his mother. Dune is compared to Parzival in the structure of the quest and motifs used as well as contrasted due to the adaptations made to the quest for an audience of science fiction in 1965. Jessie L. Weston's seminal work From Ritual to Romance (1919) is used to examine the Wasteland motif. Campbell, Barber, and Weston are used to dissect the importance of the Wasteland motif in both novels. The Wasteland motif enjoys a particularly important role in Dune on the planet Arrakis. Paul Atreides, like Parzival, achieves his quest and becomes king of his own grail castle.

Tyler Jacobs

Mentor: Brad Modlin

Title: Portraits in the Glass

I am indebted to everything. Within my poetry I strive to see and hear the things around me that have seemingly been missed by so many, most times this is the quiet moments of living. I titled the six poems in this series "Portraits in the Glass" as a study of self in place. The idea of place examines the physical or the emotional throughout each poem, some examine both. These six poems deal with the physicality of home, self in another's life, and the city, state and country in which we live. This includes the outcome of events that shape us as we grow and everything that comes after, what traditions one generation holds dear and what traditions another tosses in the waste bin, and what makes up the moral compass of our character. My interest is answering this question: Who are we? With poetry, my goal is to take the way I've observed and understand the world and share a completed product that outwardly touches and connects us together. The next step is publishing, a process which I have already begun as ten of my poems have appeared, or slated to appear, in literary journals. The six poems in this series is "Smudges," "The Public House," "Standing Water in Central Nebraska," "June 21: Poem for Kearney," "The Hunted," and "A Portrait of My Mother." My hope with these poems is that they allow those who read them to find themselves nearer to one another.

Kayla Wentz

Mentor: Rebecca Umland

Title: Percy Bysshe Shelley: A Revisionist of Dante Alighieri

Using a variety of textual critical approaches, I am writing an academic article about Percy Bysshe Shelley's role as a revisionist of Dante Alighieri. Although he applies Dante's strategies and ideas to his works, Shelley also asserts his own vision; this is what makes him a revisionist. Though he is separated from Dante by time, language, style, and political and religious philosophies, Shelley owes a great debt to Dante in form, in imagery, and in his views about the way in which the poetic and prophetic converge. To explain the unlikely relationship between these two poets, I am focusing on the indebtedness of Shelley's final poetic endeavor, *The Triumph of Life* (1824), to Dante's *La Divina Commedia* (1472) and *La Vita Nuova* (1294). I am also consulting Shelley's "A Defence of Poetry" (1840) as well as the following books: *Shelley's Mythmaking* (1959) by Harold Bloom, *Dante and English Poetry* (1983) by Steve Ellis, *The Circle of Our Vision* (1994) by Ralph Pite, *Romantic Europe and the Ghost of Italy* (2008) by Joseph Luzzi, and *Dante and Italy in British Romanticism* (2011) by Frederick Burwick.

History

Tatiana Moore

Co-Author: Mitch Robey

Mentor: Jeff Wells

Title: Retracing Old Lines: The Story of World War II Correspondence to the Doane Family of Bayard, NE

Spawned from a fortunate online-sale discovery, "Retracing Old Lines," a team-based project, sought to uncover, explore, and interpret the connection between the Doane family of Bayard, Nebraska, and the nine soldiers, as well as two civilians, who wrote to them between the years of 1943 and 1946. Primarily based on the 84 handwritten letters, the project consisted of the transcription of these posts and the building of the genealogical structure of the authors' families. Finally, the narrative was complemented by the addition of communication with descendants and relatives of the correspondents. This project highlights the theme of home front and war front correspondence, providing a glimpse into the lives of these soldiers from World War II.

Miriam Nieto

Mentor: Christopher Steinke

Title: The Cherokee Syllabary: The History and Re-emergence of a Native American Writing System

The Cherokee language has a writing system called the Cherokee Syllabary created in the early 1800s by a man named Sequoyah. After hard work and dedication, he got his system approved by the General Council of the Eastern Cherokees. As more people encountered the writing system, more people started learning it. As more people started adapting the syllabary, books and newspapers came to be written in Cherokee. When the Trail of Tears occurred in the 1830's the syllabary was affected and was rarely used, but over the years it re-emerged. To this day, the syllabary is present in everyday life in some areas of the USA. There are various newspapers, radio shows, community signs, etc showcasing the Cherokee Syllabary.

Mitch Robey

Co-Author: Tatiana Moore

Mentor: Mark Ellis

Title: Retracing Old Lines: The Story of World War II Correspondence to the Doane Family of Bayard, NE

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by the addition of communication with descendants and relatives of the correspondents. This project highlights the theme of home front and war front correspondence, providing a glimpse into the lives of these soldiers from World War II.

Macey Stall

Mentor: James Rohrer

Title: The Diaries of Verna

At the time of her diaries, Verna Holmes was a young girl living on a farm outside of Overton, Nebraska. The daughter of two Swedish immigrants, Verna attended Overton High School and even received a college education at Cotner College, which was located in Bethany, Nebraska (present day Lincoln, Nebraska). Her iaries span a vast number of years, and the exact number of volumes is unknown. The first diary is labeled as vol. 4 and begins in 1904 and details her final years at Overton High School. The next diary takes place in 1907-08, during Verna's second year at Cotner College. The last diary is labeled as vol. 33 and takes place in 1909, during Verna's final year at Cotner College and details the beginning of her time as a member of the singing group, "The Five Stars," who eventually toured across the country. Within these diaries one can see the struggles of those living in the Great Plains during this time period; as well as, the struggles of immigrants during this time period.

Kinesiology & Sports Sciences

Nia Station

Mentor: Thomas Orr

Title: Mindfulness in Athletes

We will discuss information we have collected on mindfulness and how it applies to sports. A few topics that will be discussed are sport mindfulness, flow theory, and how athletes practice mindfulness to become more mentally tough and maximize performance. We will also talk about the parent and athlete relationship, how mindfulness is taught, and Brian Cain's idea of Mental Performance Mastery.

Dakota Waddell

Mentor: Gregory Brown

Title: The Effect of Yoga Versus Mindful Meditation on Stress and Anxiety in Physically Active and Non-Physically Active Female College-Aged Students

Many adults suffer from high anxiety and stress, using therapy and pharmacology to treat their symptoms. However, yoga and mindful meditiation have been shown to decrease stress and anxiety. To determine the impact of the impact of yoga vs mindful meditation on stress and anxiety in physically active vs non-physically active adults, participants will complete a 20-minute session of yoga and a 20-minute session of meditation. Stress and anxiety levels will be determined using the State-Trait Anxiety Inventory-state. I anticipate that yoga will reduce anxiety and stress levels more than mindful meditation and that a greater reduction in stress and anxiety will appear in subjects who are non-physically active.

Management

Kylie Johnson

Mentor: Michelle Fleig-Palmer

Title: Impacts of Provider Trustworthiness on Adult Vaccination Adherence

Recent outbreaks of measles and pertussis in the United States has led to an increased focus on vaccinations. However, vaccination schedules for adults can be difficult to manage in regards to population health because the timing for adult vaccinations varies between individuals. In addition, the irregularity of adult vaccination schedules creates an increased dependency on healthcare providers because adults may be unaware of what vaccinations they need and when they need them. In cases of increased dependency, a poor relationship with a provider could be detrimental to vaccination adherence. This study examined the impact of perceived trustworthiness of healthcare providers on adult vaccination adherence. In a sample of 51 respondents, statistical analyses revealed positive relationships between the independent variable of perceived provider trustworthiness and the dependent variables of patient activation and self-reported vaccination adherence. Results of this study suggest that efforts to improve population health should include assisting providers in understanding how to increase their trustworthiness as perceived by patients. Recommendations are provided to assist healthcare providers in improving their trustworthiness regarding vaccination adherence.

Marketing, Supply Chain, & MIS

Seth Taylor

Co-Authors: Hayley Burke, Taehoon Kim, & Baylee Mendenhall

Mentor: Greg Broekemier

Title: Attitudes & Perceptions of UNK Study Abroad Programs

Our team was approached by the UNK Study Abroad Office to conduct marketing research for the organization. The goal for the business to be more informed when marketing to students. The objectives set for this research are as follows:

1. To discover whether students have heard about the

UNK Study Abroad Office or its programs.

2. To discover which UNK student demographics are interested in studying abroad.
3. To determine which obstacle are deterring UNK students from studying abroad.
4. To discover which factors are important to UNK students when deciding whether to study abroad.
5. To determine how to most effectively promote the UNK Study Abroad Office and its programs.

With these objectives set, a survey was created and distributed to undergraduate students attending classes at UNK by two different methods. The first method was to send the survey by email to 250 randomly selected students. This yielded 20 usable responses. The second method was visiting strategically selected classes and distributing the survey by QR code. This method yielded 177 complete responses.

From this data, the research team found that while most students are aware of the UNK Study Abroad Office and its programs, most students are unlikely to study abroad. However, this likelihood varies depending on the programs offered and the student demographics. The team then recommended that the UNK Study Abroad Office increase its efforts to market summer programs, provide more incentives to entice students to study abroad, and increase focus on younger students with lower debt.

Mathematics & Statistics

Gamaliel Montero Alcaraz

Mentor: Jia Huang

Title: Prime Distribution between Consecutive Powers

This talk concerns the uncovering of patterns in the distribution of prime numbers between consecutive powers through the computation of differences between consecutive powers. Finding order and predictability in the chaotic nature of prime numbers can provide us with useful insight to prove prime-related truths. I will provide numerical examples and discuss future work and applications.

Music, Theatre, & Dance

Rochelle Hazelton

Mentor: Anne Foradori

Title: A Gift of Love and Friendship: Zwei Geange, Op. 91 by Johannes Brahms

Composer Johannes Brahms is widely regarded as a genius of the 19th century. Successor to Beethoven in large orchestral and chamber forms, and to Schubert and Schumann in miniature forms of piano and Lieder, Brahms equally embraced Renaissance and Baroque polyphony, and the folk traditions of his native Germany. His synthesis of conventional forms and dance idioms with the harmonic language of the mid-and-late 19th century produced a canon of works that include nearly all genres, and established his as a fundamental voice of the Romantic Era. Brahms' music reveals the work of a craftsman – straightforward, honest, and true to form. His restraint and stoicism belie a voice rich in texture, impassioned and raw in its tenderness.

Influential in his development as a composer were close friendships with Robert and Clara Schumann, and Joseph Joachim. As evidenced in volumes of correspondence among these friends, Brahms shared drafts of his compositions with these trusted associates, drawing encouragement from their enthusiasm for his work as a moderate traditionalist. Joachim was pivotal in influencing Brahms as an artistic technician in creating chamber music for strings.

Nowhere is this influence more evident than in Brahms' op. 91, Zwei Gesänge für eine Altstimme mit Bratsche und Klavier, which he composed for violinst Joachim and his wife, contralto Amalie Weiss. He wrote the first song, "Geistliches Wiegenlied" for the couple as a wedding gift in 1863, and the second song, "Gestillte Sehnsucht" in 1884 for the couple during a difficult time in their marriage.

These songs embody some of the most celebrated aspects of Brahms' compositions – rich and dense musical textures, "equal" partnerships characteristic of Brahms' chamber music, and a self-controlled passion that expresses a sincerity and respect for musical and emotional truth. This paper explores these two songs as pivotal chamber works by Johannes Brahms.

Political Science

Braydon Conell

Mentor: Satoshi Machida

Title: Stitched Together: How Media Bias Affects Immigration Perceptions

Given the current political climate of the United States, immigration is becoming an increasingly divisive issue at all levels of our governance system. Previous research has examined the existence of immigration in news media. For example, one study has looked at how distance from the U.S.-Mexico border affects bias. However, in order to more deeply understand what this bias in news toward immigration means, it is important to examine how this bias affects the reader. This present research will look at how social capital can be influenced by bias in literature. Further, in-out group theory is inspected as a potential explanation for how people react to bias. These two overarching theories are used as the framework of analysis. To collect data, a survey is constructed with two sample news articles. Group 1 is the control with no article. Group

2 will be negative bias toward immigrants. Group 3 is positive bias toward immigrants. The data are compared to give insight into how people, and potential voters, react to news bias.

Erin Green

Mentor: Diane Duffin

Title: Classical Republican Virtue and Mary Wollstonecraft's Republican Virtue

Republicanism is a complex political ideology that has fluctuated in values since its origin. Historically, classical republicanism explains virtue as putting the societal good above an individual's self-interest. A virtuous society is comprised of virtuous individuals, and free individuals are only possible in a virtuous and free society. Scholars of republican theory, like Susan James, Lena Halldenius, and Philip Pettit, have recently argued for a traditionally feminist theorist to also be identified as an exceptional representative of republican theory. This thinker is Mary Wollstonecraft, whose ideals, use, and explanation of republican virtue will be the basis of this presentation. Wollstonecraft was a prominent thinker in the late-18th century who has been considered the mother of feminist theory by many contemporary feminists and political theorists. Her most prominent works, *A Vindication of the Rights of Men* and *A Vindication of the Rights of Woman*, have recently been read and examined in a new light, thus illuminating her republicanism and her arguments against the well-known republican thinkers of her time. With this new interpretation of her work, we can also see how these republican values were incorporated and, more accurately, the ideological foundation of her feminist theories. This presentation will explain why scholars see Wollstonecraft as a classical republican, and what this means for her feminism. Wollstonecraft's use of republican virtues will further be compared to classical republican thinkers like Cicero and Aristotle and analyzed to identify whether the virtue is represented or considered the same way as they were originally presented.

Samantha Grieser

Mentor: Diane Duffin

Title: Party Polarization in House Committees During the 1993 Health Care Act

The purpose of this research is to understand party polarization at the committee level in Congress. To achieve this goal, a literature review of *The Congressmen's Voting Decisions* by John Kingdon will be discussed to illustrate the factors that influence a congressman's or congresswoman's vote. This is needed because party polarization is measured using the DW Nominate scores of congressmen's or congresswomen's votes. The DW Nominate scores come from a website where congressmen and congresswomen's scores are already listed. To find out which committees were involved with amending and passing parts of the 1993 Health Act, the 1993 Congressional Quarterly Almanac was used, along with Congress's website. Then committee rosters were obtained, and a tally was completed to find the 'yays' and 'nays' that were said to pass a part of the bill at the committee level. Out of the eight committees that passed the different parts of the bill, six held voice votes while the other two committee votes were stated in the CQ Weekly for the month the vote took place or were stated in documents that were obtained by microfiche. The two committees where votes were found are the Education and Labor and Ways and Means. This gave a sample size of 78 members to obtain DW Nominate Scores and their vote. Statistical tests were completed to demonstrate there were no differences between the committees, and party is a driving force of polarization at the committee level.

Makenzie Petersen

Mentor: Diane Duffin

Title: Literature Review on the Gender Balance within Curriculum and Classroom

Within the past academic year, I have been able to delve deep into literature regarding ideals of democracy, equity, and fairness among genders. Inspired by literature like that of, Anne Curzan's, "Fixing English" (specifically the chapters five & six: "Nonsexist Language Reform and its effects" and "Reappropriation and Challenges to Institutionalized Prescriptivism) and Miller, Casey, and Kate Swift's book, "Words and Women: New Language in New Times" (specifically chapter two: "Who is man?"). I decided to look further into the equity within school systems, specifically that of the gender balance within curriculums and vocabularies within the classroom. We should not just be studying one type of person within our public education classrooms, but instead every type, every race, every ethnicity, every gender.

This project serves as part of a larger project proposal with its duties to target the injustice and identify how Nebraska's policies on Curriculum/Learning Standards interact with the teaching of influential women within the classroom. It also acts as a literature review on what has been written about the gender imbalance within educational curriculum. This was found through the literature listed above, "Where are the Women?: A Report on the Status of Women in the United States Social Study Standards" by The National Women's History Museum, and the NDE Content Area Standards.

The next step of this project will encompass surveying public educators to discover how they balance genders within their curriculum as well as the use and balance of pronouns within their classrooms.

Haley Pierce

Co-Author: Michael Rohde

Mentor: Chuck Rowling

Title: Press independence in a partisan environment: A comparative analysis of U.S. news coverage of the Kyoto Protocol, American Clean Energy and Security Act, and Paris Climate Agreement

Although scientists have reached a general consensus on the causes and consequences of climate change, US news coverage has remained clouded by doubters and deniers who are now becoming part of a shrinking minority. This study examines the extent to which "false balance" has shaped news coverage of climate change in the wake of the Kyoto Protocol (1997), the American Clean Energy and Security Act (ACES) (2009) and the Paris Climate Agreement (2016). As research has shown, false balance—the notion that journalists might give relatively equal weight to opposing viewpoints on an issue even when the evidence does not support it—tends to manifest most often in news coverage of science issues. This stems, in part, from journalists adherence to the objectivity norm as well as the difficulty of reporting on complex scientific issues. With this in mind, we analyzed US political and news discourse surrounding Kyoto, ACES and Paris, focusing on how the nature of the problem, its causes, who should be held responsible and what should be done to address it were framed. We find that news coverage was significantly less false-balanced—i.e. more likely to ignore or discredit dissenting voices and ideas on climate change—over time across the three cases. Notably, this occurred despite minimal change in the overall valence of congressional discourse on climate change. We reflect on the implications of these findings.

Michael Rohde

Mentor: Chuck Rowling

Title: False Balance in Journalism: Public and Government Language during the withdrawal from the Paris Climate Accords

This project will explore the topic of "false balance" in journalism, how it has played into public opinion on climate change, and how potential changes in reporting on the topic could potentially affect public opinion. Furthermore, this project will be aimed at determining the disparity or lack thereof in the White House and journalistic language on climate change surrounding the withdraw from the Paris Climate Accords. Our previous research was centered around finding differences in reporting on three major climate change acts; the "Kyoto Protocol," the "American Clean Energy and Security Act," and the "Paris Climate Accords." We found that while the media, over time, reported climate change closer to congressional science record stayed about the same. Now that we are at a time of official withdrawal from the Paris Climate Accords, we want to examine if the same trend is occurring with the official White House statements regarding climate change and the Paris Climate Accords comparatively to what the media reports. To do so, we will analyze multiple media sources via content analysis in conjunction with source coding. These sources include; the New York Times, the Wall Street Journal, CNN, Fox News, and official White House statements. This project will further knowledge into "false balance" and its effects over time.

Psychology

Cy Cannon

Mentor: Bill Wozniak

Title: Evaluation of the Moth Effect: Myth or Valid Psychological Phenomenon

Drivers face a multitude of distractions while behind the wheel. Several are quite common and apparent; however, one in particular, dubbed the Moth Effect, is shrouded in mystery. The Moth Effect is best described as the tendency for a driver to fixate on a flashing light, inadvertently steer toward the source of said flashing light, and possibly cause a collision. The popular press and even law enforcement attribute it as the cause for collisions with state patrol vehicles with their take-down lights on (flashing lights). These claims, however, are not backed up by reliable science. Empirical evidence regarding the Moth Effect is extremely limited overall, begging the question: Is the Moth Effect a valid psychological phenomenon impacting transportation safety, or is it simply a myth that lives on via anecdotal references? A series of experiments were conducted to further examine the validity of the Moth Effect. By comparing data across several studies, more light has been shed on this subject. What conditions may or may not increase the likelihood of the Moth Effect being present will be addressed, in addition to the overall validity of the effect itself.

Abigail Borgman

Mentor: Krista Fritson

Title: Effects of Essential Oils on Anxiety, Mood, & Task Performance: Lavender and Peppermint

The use of aromatherapy and essential oils is growing in popularity, and there are claims that lavender essential oil has benefits of reducing anxiety, depression, restlessness, and insomnia (Nordvist, 2018). On the other hand, Dunnigan (2014) found no significant effects when examining the use of aromatherapy (with peppermint essential oil) to reduce test anxiety and increase test scores in college students. Essential oils are regarded by some to "cure" everything from sore muscles, stress, and other psychological issues, but do these oils pose a real benefit or are they just another wellness marketing ploy? The purpose

of my research is to expand on the knowledge of lavender and peppermint essential oil use and its possible effects on anxiety, mood, and task performance. My research includes college age individuals at a Midwestern university. A Repeated Measures ANOVA is used to analyze the data.

Teacher Education

Lupe Perez

Mentor: Martonia Gaskill

Title: Midwest Ethnic Minority Educators: The Good, the Bad, and the Ugly

Education is constantly changing and innovating with the goal to provide the best learning experiences for all students. A current interest in the research literature is understanding the challenges and opportunities associated with employing minority teachers in K12 schools. This study supports claims that children need to be able to build relationships with diverse people and relate to others from different backgrounds from a young age. Nieto & Bode (2008) claim that US schools are becoming more and more diverse while the teacher body is going in the opposite direction and becoming more homogeneous. When it comes to the distribution of the highly qualified teachers in the school systems, poor and minority student populations are less likely to get their fair share (Peske & Haycock, 2006). The purpose of this qualitative study was to explore how minority teachers in Midwestern K12 schools describe their professional experiences as classroom teachers, and relationships with students, fellow teachers, parents and administrators. Interviews were conducted with thirty minority teachers employed in small, large, urban and rural schools in a Midwestern state. This study provided an intriguing perspective into the world of ethnic minority teachers in the public school system. Results revealed several major themes: Cultural Brokering, Culturally Responsive Educators, Disproportional Representation, Unsustainability, and Implicit Bias.

Index by Poster Number

Index of Participants

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