

Schedule of Events

April 18, 2024

Nebraskan Student Union Ponderosa Rooms



Thursday, April 18, 2024

- 7:30 - 9:00 am** Students set up posters, (Sessions 1&2)
Ponderosa A&B
- 9:00 – 10:30** Session 1: Natural & Physical Sciences Poster
Presentation
- 10:30 am – 12:00 pm** Session 2: Behavioral & Social Sciences Poster
Presentation
- 12:00 -1:00 pm** Poster removal (Sessions 1&2) and set up
(Sessions 3&4)
- 1:00 - 2:30 pm** Session 3: Prof & Applied Studies Poster
Presentation
- 2:30 – 3:30 pm** Session 4: Fine Arts & Humanities Poster
Presentation
- 4:30 pm** Closing Ceremony & Presentation of Awards

10:00 – 2:00 pm Oral Presentations

Session 5 (Ponderosa C)

10:00-10:15 Lizbeth Trejo (Pol Sci)
10:15-10:30 Paxton Robertson (Pol Sci)
10:30-10:45 Simon Clark (Pol Sci)
10:45-11:00 Jaden Longfellow (Pol Sci)

Session 6 (Ponderosa D)

10:00-10:15 Alethia Henderson (Biology)
10:15-10:30 Dana Dubas (Biology)
10:30-10:45 McKenna Cruikshank (Biology)
10:45-11:00 Mariam Garcia Escobar (Biology)

Session 7 (Ponderosa C)

11:00-11:15 Riley Grieser (Chemistry)
11:15-11:30 Mohmmmed Nour (Physics)
11:30-11:45 Dylan Johnson (Physics)
11:45-12:00

Session 8 (Ponderosa D)

11:00-11:15 Sadie Cooley (Biology)
11:15-11:30 Naara Ramirez (Biology)
11:30-11:45
11:45-12:00

Session 9 (Ponderosa C)

12:00-12:15 Katie Cornelio (History)
12:15-12:30 Abigail Dittmer (History)
12:30-12:45 Tatiana Moore (History)
12:45-1:00 Mason Morhain (Psychology)

Session 10 (Ponderosa D)

12:00-12:15
12:15-12:30 Kenny Mitchell (English)
12:30-12:45 Joseph Hiatt (Grad Studies)
12:45-1:00 Shanon Kempt (KSS)

4:30 - 5:00

Closing ceremony & Presentation of Awards

Oral Presentations

Room: Ponderosa C

Session 5

- 10:00 am---**Lizbeth Trejo:** *The Israel and Palestine Conflict using (Mentor – Chuck Rowling)*
- 10:15 am ---**Paxton Robertson:** *Deterioration of Democracy in Countries Around the World (Mentor – Chuck Rowling)*
- 10:30 am ---**Simon Clark:** *Violence, Reconciliation, the Northern Ireland Peace Process and its Applications in Regions of Conflict (Mentor – Chuck Rowling)*
- 10:45 am ---**Jaden Longfellow:** *Identifying Warning Signs of Democratic Backsliding (Mentor – William Aviles)*

Room: Ponderosa D

Session 6

- 10:00 am---**Alethia Henderson:** *Examining Sex Differences in the Response of Lung Type 2 Innate Lymphoid Cells to Peanut (Mentor – Joseph Dolence)*
- 10:15 am ---**Dana Dubas:** *Examining How Sex Differences Influence the Ability of Neutrophils and Dendritic Cells to Mount Response Following Inhalation of PN (Mentor – Joseph Dolence)*
- 10:30 am ---**McKenna Cruikshank:** *Characterization of Staphylococcus Lugdunensis Biofilms Through Ethyl Methanesulfonate Mutagenesis (Mentor – Austin Nuxoll)*

10:45 am --- **Mariam Garcia Escobar:** *Characterizing High Persister Phenotypes in Staphylococcus Epidermidis Clinical Isolates* (Mentor – Austin Nuxoll)

Room: Ponderosa C

Session 7

11:00 am --- **Riley Grieser:** *Investigating the Photophysical Properties of 2 Derivatives 1,8-Naphthalimide Nebraska* (Mentor – Haishi Cao)

11:15 am --- **Mohammed Nour:** *Continuation of Infrared Bubble Investigation* (Mentor – Brandon Marshall)

11:30 am --- **Dylan Johnson:** *Study of Electron-Impact Scattering of Tungsten Ions* (Mentor – Jeremy Armstrong)

11:45 am ---

Room: Ponderosa D

Session 8

11:00 am --- **Sadie Cooley:** *Effect of Androgen Receptor on Over-Mark Preference in Male Mice* (Mentor Nicholas Hobbs)

11:15 am --- **Naara Ramirez:** *The potential effects of an FDA-approved antidepressant Trazodone on dyslipidemia* (Mentor Yipeng Sui)

11:30 am ---

11:45 am ---

Room: Ponderosa C

Session 9

- 12:00 pm---**Katie Cornelio:** *Documenting the Lives of Kearney Residents During the 1930's: Utilization of Primary Sources in the Secondary Social Science Classroom (Mentor – David Vail)*
- 12:15 pm ---**Abigail Dittmer:** *Ruth Matilda Anderson (Mentor – Nathan Tye)*
- 12:30 pm ---**Tatiana Moore:** *Public History in Western Nebraska: Interpreting the History of the Sioux Ordnance Depot (Mentor – Will Stoutamire)*
- 12:45 pm ---**Mason Morhain:** *From Service to Support: Evaluating Nebraska Mental Health Providers' Knowledge of military Culture (Mentor – Julie Lanz)*

Room: Ponderosa D

Session 10

- 12:00 pm--- **Kalen Krantz:** *The Adaptation of Archetypal Sites of Fear: from Beowulf to Horror Films Today (Mentor – Rebecca Umland)*
- 12:15 pm ---**Kenny Mitchell:** *“The Teeny Tiny Bird Rages Against the Man:” A Craft Talk on Time and Perception (Mentor – Theodora Ziolkowski)*
- 12:30 pm ---**Joseph Hiatt:** *Architecting Policy: Exploring the Collegiate Housing and Infrastructure Act's Impact on Fraternity and Sorority Housing (Mentor – Alyse Pflanz)*
- 12:45 pm ---**Shanon Kempt:** *A Qualitative Study on How a Coaching Change Impacts a Successful Athletic Teams Culture (Mentor – Nita Unruh)*

Graduate Oral Presentation Abstracts



History

Tatiana Moore

Mentor: Will Stoutamire

Title: *Public History in Western Nebraska: Interpreting the History of the Sioux Ordnance Depot*

Every community in the United States has some long-forgotten building or overgrown field where one once stood. Despite its condition, each site still has a story to tell. Though many of them may be lost to history, others can be interpreted for new generations through public history. Public History encourages the general public to engage with history in a myriad of ways, from visiting museums to watching documentaries. According to the National Council on Public History, Public historians strive to “mak[e] history relevant and useful in the public sphere.” But what does this look like on a practical level?

This project will discuss the development of a digital exhibit about the Sioux Ordnance Depot of Western Nebraska for the application of history to the public sphere. The history of the Sioux Ordnance Depot provides a lens through which to view Nebraska military history, women’s history, disability history, and others. By using these different narratives to create a digital exhibit, the history of the Depot becomes relevant and useful for the public. Subsequently, this project also helps to demonstrate the significance and relevance of historic sites, such as the Sioux Ordnance Depot, in the modern world. Interpreting the history of the Sioux Ordnance Depot through different lenses assists in illustrating the ways that public history can help the general public relate larger historical themes to local community sites.

Chris Reeves

Mentor: Roger Davis

Online

Title: *Rise and Fall Assessments of the National and Transnational Ideologies that lead to the Rise and Fall of Getlio Vargas and the Brazilian Estado Novo* Christopher Reeves

Brazil in the 1930's and 1940's is a case study of the influences that national and transnational ideologies had on its government and society. The result of these influences being the rise and fall of government systems and dictatorships. Brazilian social and political ideology during this time is fairly well documented from works on integralism and tenentismo to studies focusing on the effects of transnationalism. However, more work needs to be done on the connections between these concepts and their effects on government, politics, and society. In order to better understand these connections, this study argues that the same political and social ideologies that influenced the rise of Getúlio Vargas and Estado Novo also resulted in its fall with the military coup of October 29th, 1945, and the installation of a democratically elected government. Diving into the Getúlio Vargas Archive database housed by the Center for Research and Documentation of Contemporary History of Brazil, it is apparent that Vargas's political ideology was influenced by developing nationalistic political and social ideologies. Furthermore, the archives of President Franklin Delano Roosevelt reveal United States' concern about fascist Italian influences in Brazil as well as American interests in the country. Examining the ideological factors that resulted in the rise and fall of Getúlio Vargas and his Estado Novo can aid us in our understanding of how leaders are able to seize, maintain, and loose power over a country. Furthermore, it paints a larger landscape of the connections between national and transnational ideologies and their lasting impact on a country's political and social identity both in the short and long term.

Sondra Marshall

Online

Mentor: Will Stoutamire

Title: *Dispossessing the Ancestors: Science, Museums, and the Native American Dead in Nebraska*

There is limited research concerning the agency of the Native American dead in maintaining traditional tribal cultures and histories and the histories of salvage archeology and scientific racism. There are even fewer studies centered in Nebraska. In Nebraska, Native American human remains were removed from the land as Anglo-American settlers slowly laid claim to the state acre by acre, clearing the land for

agriculture, transportation, real estate and commercial development, and the burial of Anglo-American dead. Native American human remains and cultural artifacts encountered during these processes were treated in much the same manner as surviving Native Americans. The dead, instead of being forced onto reservations, were relegated to storage rooms in laboratories and museums. Instead of being assimilated into Anglo-American culture, the dead were used to help prove theories of Anglo-American racial supremacy and to provide justification for government policies towards surviving Native Americans. Anglo-American scientists and museums have long argued that their extensive collections of Native American human remains serve critical scientific research and educational purposes that benefit all of mankind, but the methods used to obtain and claim legal ownership over these macabre collections are closely aligned with the violence of settler colonialism. The mistreatment of the physical remains of Native Americans' ancestors once aided in the destruction of individual and tribal identities, territorial boundaries, cultural genealogies, and historical timelines. Under contemporary Nebraska and Federal legislation, the Native American ancestors now assist in the restoration of the same and may also assist in creating more positive relationships between Native Americans and the staff and archeologists of Nebraska's museums and educational institutions.

English

Chloe Nicksic Sigmon

Online

Mentor: Janet Graham

Title: *Understanding Environmentalism in Appalachia: An Ecofeminist and Sentimental Ecology Analysis of Kingsolver's Flight Behavior*

Ecocriticism offers an approach to literary criticism that focuses on human interaction with the environment. Barbara Kingsolver's novel *Flight Behavior* (2012) addresses the effects of and cultural response to climate change in Appalachia. Characters struggle with decisions about logging their trees for much needed money and encounter financial ruin due to flooding of their crops. Kingsolver also highlights the disproportionate rate at which poor, rural communities are impacted by climate change despite having smaller carbon footprints than those with more resources. When Dellarobia Turnbow, a stay-at-home mother of two, initially sees millions of monarch butterflies taking shelter in the trees on her family land she is awestruck. However, she

has no inkling of the potential catastrophic environmental consequences of this event nor of the changes it will bring to her life. In this research, I explore the topic of climate change as discussed in *Flight Behavior*. I have analyzed the text using both ecofeminism and sentimental ecology perspectives, and in this presentation, I will review the history of each approach as I compare and contrast them. I will also review excerpts of close analysis of *Flight Behavior* that showcase Kingsolver's synthesized ecocritical approach. In particular, I will examine the ways in which Kingsolver transforms the sentimental framework to discuss nature in the novel while circumventing its history of problematic stereotypes about women by making it more feminist, ecological, and scientific. I will draw conclusions about the importance of using people's knowledge of place, culture, and values to address environmental issues.

Kiley Truex

Online

Mentor: Amanda Sladek

Title: *The Basic Writing Classroom*

Since its beginnings as a formal area of study in the 1970s amid the advent of open admissions at the City University of New York (CUNY), basic writing has been a source of major contention. Both pedagogically within English departments and writing programs and politically within higher education administration and society at large, debates about basic writing have abounded. These controversies have ranged from what should be taught in basic writing courses to the very politics and ethics of how students are divided into varying courses—and whether that division should occur at all. While advocates of basic writing see its potential to widen access to a college education by providing an easier point of entry, critics worry about lessening the rigor of the standards of achievement that are expected at higher education institutions. More recently, criticism has focused on the social and political implications of basic writing, as non-white students and students from lower socioeconomic backgrounds are placed into these courses at higher rates. Increasing linguistic diversity in colleges and universities across the United States has also added an additional layer of nuance to the conversation surrounding basic writing instruction. My presentation will survey the history of basic writing, exploring how and why it began and has evolved over the years. I will then examine how both currently implemented and proposed models grapple with the complications of basic writing instruction.

Kalen Krantz

Mentor: Rebecca Umland

Title: *The Adaptation of Archetypal Sites of Fear: from Beowulf to Horror Films Today*

The archetypal sites of fear are paramount towards understanding the different situations in which horror can occur. Devised by Seamus Heaney in his analysis of the epic poem *Beowulf*, the sites of fear are also applicable to any place where terror is meant to exist. Heaney articulates this when he states, "In three archetypal sites of fear: the barricaded night-house, the infested underwater current, and the reptile-haunted rocks of a wilderness" (Heaney, xii). The three places in which fear occurs in the poem are the three places where humans are most vulnerable. Examples of the three archetypal sites of fear can be seen in *Home Alone* (1990), *Alien* (1979), *Child's Play 2* (1990), and *The Witch* (2015). Through examining the original sites of fear, and then comparing the original site to the adapted site through film, an established understanding of how these sites are adapted can be reached. The archetypal sites of fear are seen through modern horror films through the barricaded nighthouse, the infested under-water current, and the reptile-haunted rocks of the wilderness which are all adapted for modern audiences in a variety of ways.

Teacher Education

Amber Bock

Online

Mentor: Phu Vu

Title: *Harmonizing Rhythm Literacy: Standardizing Teaching Methodologies for District-Wide Music Education Improvement*

This study explores the implementation of a unified rhythm literacy curriculum within a diverse high school music program, focusing on the Teaching Rhythm Logically system by Darcy Vogt Williams. The initiative aimed to address the inconsistency in rhythm counting methodologies that students encounter throughout their music education journey, from elementary through high school levels.

The intervention involved daily rhythm drills using Garwood Whaley's Basics in Rhythm, combined with the structured approach from Teaching Rhythm Logically. The curriculum was tested on approximately 50 students across concert and jazz band classes at Omaha North High School, a low-income institution with a high student mobility rate and a diverse student body, incorporating a pre-test and post-test to

measure effectiveness. The study sought to standardize rhythm counting across the district to improve students' music reading abilities, particularly in rhythm literacy.

Results indicated significant improvements in rhythm reading skills across all grade levels and instrument sections, with data collected through qualitative analysis. This suggests that a consistent teaching methodology, even in a district with high variability in student backgrounds and educational experiences, can significantly enhance fundamental music literacy. The research underscores the potential benefits of adopting a district-wide approach to rhythm literacy, paving the way for further studies on curriculum standardization and its impact on music education.

Kinesiology and Sports Sciences

Shanon Kempt

Mentor: Nita Unruh

Title: *A Qualitative Study on How a Coaching Change Impact a Successful Athletic Teams Culture*

The purpose of this qualitative study was to determine what, if any, relationship exists between a change in head coach and team culture. In other words, is an athletic team's culture reshaped when there is a change in head coach. If so, to what degree? A review of the current literature revealed that the hiring of a new head coach results in changes within a team's culture when a team is underperforming. In fact, a new coach will often target team culture as the place where change needs to occur to improve team performance. No research touched on how a coaching change impacts a successful team's culture. This study worked to add to the existing research by examining a successful program's experience of a new head coach. Data collection involved a mixed-method approach that included an anonymous online questionnaire and a follow-up in-person interview. This study was conducted among the University of Nebraska-Kearney Women's Basketball team as it had recently experienced a change in head coach. Participants included the new head coach and eight players ranging from sophomore to graduate student status. Results indicated that a coaching change does have some impact on a successful team's culture.

Graduate Studies and Academic Outreach

Joseph Hiatt

Mentor: Alyse Pflanz

Title: *Architecting Policy: Exploring the Collegiate Housing and Infrastructure Act's Impact on Fraternity and Sorority Housing*

The Collegiate Housing and Infrastructure Act of 2023 (CHIA) represents a pivotal development in the realm of collegiate housing and higher education policy, aiming to address the affordability and quality of fraternity and sorority housing through tax-exempt charitable grants. This research delves into the transformative potential of the CHIA on the landscape of Greek housing, examining its implications for student experiences, organizational sustainability, and community development. Through an analysis of the legislation's provisions, objectives, and implementation mechanisms, this study evaluates the extent of which the CHIA aligns with broader policy goals of promoting access to affordable and safe housing for college students. Drawing on stakeholder perspectives, policy analysis, and empirical evidence, this research sheds light on the opportunities and challenges associated with the CHIA, offering insights for policymakers, housing providers, and student advocates. By examining the intersection of policy, education, and student life, this study contributes to informed decision-making processes and advances discussions on enhancing the collegiate experience for future generations.

Undergraduate Oral Presentation Abstracts



Fine Arts & Humanities

English

Kenny Mitchell

Mentor: Theodora Ziolkowski

Title: *"The Teeny Tiny Bird Rages Against the Man:" A Craft Talk on Time and Perception*

In this craft talk, I will delve into the complex revision process I undertook for my short story, "The Teeny Tiny Bird Rages Against the Man." This fantastical story, told in the style of magical realists like Aimee Bender, Donald Barthelme, and George Saunders, delves into themes surrounding the need to be loved and asks the question what do we risk when our search for purpose overtakes our capacity for connection? Told from the perspective of the Teeny Tiny Bird (the wooden bird living inside a cuckoo clock), the story follows its journey as it breaks free from its mechanical confines to connect with the Man of the House, one of the creators of its world. Central to this story is the Teeny Tiny Bird's perception of reality and its sensation of being tethered to time, which plays into the narrative in the Teeny Tiny Bird's connection to time as it struggles to find its sense of purpose outside of the clock it calls home. I will discuss the evolution of the story from its initial draft to its final form, focusing on the choices made to alter time and perception to create a cohesive and impactful narrative. I hope to provide insight and inspiration for fellow writers looking to refine their own writing process.

History

Abigail Dittmer

Mentor: Nathan Tye

Title: *Ruth Matilda Anderson*

Ruth Matilda Anderson was a Kearney-native who became internationally renowned for her photography of Spain. Her father was Alfred T. Anderson, a prominent photographer of early Kearney. She graduated from Kearney High School in 1910 and in 1916 from the Nebraska State Normal School in Kearney. Shortly thereafter she moved to New York to pursue an education in photography at the Clarence White School of Photography. In 1921 she was hired to the Hispanic Society of America. In 1924 she was sent on her first Spanish assignment to document the costumes and customs of Galician culture. Throughout her life she traveled and photographed around the world until she passed in 1983.

My URF is a biographical study of Anderson to analyze and understand the bigger cultural underpinnings of her life. Why did a young woman from rural Nebraska move to New York in the 1910s and focus her photography career on Spanish culture and costumes?

Significant historical movements were at play her life, as they pushed and pulled her from Nebraska to New York and then to Spain. She followed this path to find better opportunities to learn and grow in her art of photography and to connect with a community of people she identified with. This presentation will share my findings and point to major influences in her artistic and vocational development as a photographer in Spain.

Katie Cornelio

Mentor: David Vail

Title: *Documenting the lives of Kearney residents during the 1930s: Utilization of Primary Sources in the Secondary Social Science Classroom*

Using primary sources in social science classrooms is known to generate meaningful questions, develop critical thinking skills, and foster a connection between the student and the material from a different period. The importance of primary sources from one own's community is even more critical when trying to connect students to content, but also the community around them. The use of primary sources aids in developing the holistic learner. Students learn social-emotional skills by analyzing stories of those from the past and using applications to connect the material to deeper learning.

Purpose: The purpose of this research is to study the attitudes of students, understanding of material, and application of the social-emotional learner to the utilization of federal emergency relief records for the Kearney area during the Dust Bowl in the 1930-1940s in a secondary social studies classroom. Method: After digitizing 500 documents at the Buffalo County Historical Society, a lesson plan was created to use half of the class without primary sources and another part of the class to include the newly digitized primary sources. The students, after completing the lesson, used reflection questions to gather information on their emotions when observing primary sources from their community. They also reflected on the most remembered story and why they believed it stuck with them. The summative assessment at the end of the unit included questions from the activity to check for understanding over time. Results: Data is currently being collected and analyzed.

Behavioral & Social Sciences

Political Science

Simon Clark

Mentor: Chuck Rowling

Title: *Violence, Reconciliation, the Northern Ireland Peace Process and its Applications in Regions of Conflict*

Why this topic is important: While there are a myriad of complexities to every civil rights movement that has occurred in the course of human history there is always a common theme which is the systematic oppression of one group to keep them below the current power base. When that oppression reaches its boiling point it often erupts into political violence and terrorism. The Troubles of Northern Ireland began when political violence became the recourse of members of poor, working-class, Nationalist, and predominantly Catholic communities in Northern Ireland were not being granted the civil rights they strove for. Several factors of the system of oppression fostered terroristic responses to government inaction in the legal and legislative processes. What makes the study of this movement particularly important is that it shows how the response and reconciliation of political violence can be formatted to promote peace amongst once-warring factions. The Peace Process in Northern Ireland started by The Good Friday Agreement can provide a structure for addressing active conflicts related

to rejecting oppressive systems. There are many ways for states to reflect on their times of civil unrest, conflict, and violence, the question that must be asked is how to grow from that divergence to benefit all parties and those caught in the middle. The Troubles were a dark time in the 20th Century in Ireland and the United Kingdom, but the delicate peace that has been achieved must be studied to see if it will hold, and where else in the world the process could take root.

Paxton Robertson

Mentor: Chuck Rowling

Title: *Deterioration of Democracy in Countries Around the World*

Through this undergraduate research project, I explored the topic of democratic deterioration in countries around the world. My research question is: Are there unexplored causes of the regression of democracy? This question can be split into three smaller topics. First, what is the state of democracy around the world? Second, what causes democratic backsliding? Third, how should the US and other countries or institutions support democracy? There is a large and diverse body of research on the topic of democracy. Data from a variety of sources demonstrate a general decline in the quality of many democracies. This is based on my exploration of the democratic measurements outlined by sources such as Freedom House, the National Endowment for Democracy, the Global State of Democracy Initiative, the Economist Intelligence Democracy Index, and the V-Dem Institute. I then researched issues of democratic consolidation and the preconditions that support it, including theories relating to economics, resources, and geographical location, among others. Next, I explored the relationship between democratic preconditions and democratic decline, and the effects of contemporary issues. The next step in my research project will include readings on the measures used by countries and organizations to bolster democracy and the success or failure of these methods.

Jaden Longfellow

Mentor: William Aviles

Title: *Identifying Warning Signs of Democratic Backsliding*

In the aftermath of the January 6th insurrection, the people of the United States are forced now to confront a significant new global trend identified in the early 21st century: democratic backsliding, or the gradual degradation of the norms, rules, or institutions that support the democratic norms and institutions within a political system.

Examining the existing literature on democratic backsliding, we see significant progress in exploring how backsliding occurs and how it impacts a nation. There are

two basic theoretical frameworks within the literature, one that emphasizes the roles and incentives of institutions and actors within those institutions, and one that centers changes in public sentiment and support for democracy. However, little attention has been paid to identifying early warning signs of democratic backsliding, as a result, we seek to understand the following questions: What changes or trends in social, economic, and political indicators are predictive of incidents or periods of democratic backsliding in nations? I am interested in investigating indicators such as income/wealth inequality, nationalistic political sentiment, and social integration. How reliable are these warning signs? And can any of these warning signs predict the general form or category of backsliding that occurs?

In order to answer these questions, I will analyze the change in social, economic, or political indicators in the years before incidents or periods of identified democratic backsliding.

Lizbeth Trejo

Mentor: Chuck Rowling

Title: *The Israel and Palestine Conflict*

For my undergraduate research project, I will be researching about the conflict between Israel and Palestine. More specifically, how the international system is handling the humanitarian aspects in the Israel and Palestine conflict as well as focusing on human rights that have been violated throughout the conflict. I will gather information regarding my research in articles, books, and documentaries. Some of the reasons why there is a constant struggle has to do with land distribution and its religious significance to Palestinians and Israelis. This will give me an understanding of the historical background of the Israel and Palestinian struggle that began in the 20th century and how it still applies to recent events that started on October 7, 2023. I will also gather research about how international systems like the United Nations, non-governmental systems and individual countries have been involved in attempts to resolve the conflict. This will consist of the international community advocating for a peaceful resolution by upholding the international law and protecting human rights that have been violated by Israel. This 75+ year complex conflict between Israel and Palestine continues to be a major concern for the international community as it has impacted thousands of people's lives in that region.

Psychology

Mason Morhain

Mentor: Julie Lanz

Title: *From Service to Support: Evaluating Nebraska Mental Health Providers' Knowledge of Military Culture*

The purpose of this study was to identify the current level of military cultural competence (MCC) among Nebraska mental health providers. MCC is defined as the “language, system of rank, norms and values, identity, ethics, and rapport that are distinct from U.S. civilian culture” (Collins et al., 2023, p. 1). A frequent complaint of veterans and military-connected families (MCFs) is that mental health providers do not understand their experiences. Veterans are more likely than civilians to live in rural areas which suffer from a shortage of mental health providers. There has been very little research done on MCC of mental health providers. Given that only 34% of U.S. providers report having any training in military culture (Tanelian et al., 2014), understanding the level of MCC among Nebraska providers is critical if the state wishes to best serve its veterans and MCFs. Using an online survey design, we recruited mental health providers in Buffalo and Hall County to participate in a survey. There was a response rate of 23.6%, with 13 out of the 55 total participants we mailed who completed the survey. Of those who did respond, all were white, had no prior service history, and did not meet the threshold for having high military cultural competence (N = 13). With around 94% of counties in Nebraska having a shortage of providers (Ostrowicki, 2023), there is a strain on MCFs to obtain services in the first place. Also, these results indicate that there is a shortage of mental health professionals available who are competent in servicing military and MCFs.

Natural & Physical Sciences

Biology

Alethia Henderson

Mentor: Joseph Dolence

Co-Authors: Leigh-Anne Lehmann, Sunanda Rajput, Nicholas Hobbs

Title: *Examining sex differences in the response of lung type 2 innate lymphoid cells to peanut*

Much remains to be learned about how peanut (PN) initiates immune responses to elicit PN allergy. Specifically, how sex differences impact the development of PN-specific immune responses remains unclear. We have shown that type 2 innate lymphoid cells (ILC2s) in female lungs display greater responses than those in males after 3 days of PN inhalation. This study aimed to further elucidate how ILC2s in the lungs of mice react to PN during the genesis of PN allergy. We exposed male and female mice to PN in an 11-day inhalation model to investigate how sex differences impacted the response of lung ILC2s at a time point just before PN-specific adaptive responses begin to elicit PN-specific IgE. Female mice showed a greater ILC2 response to PN compared to males in the lungs after 11 days of PN exposure. Furthermore, the ILC2s expressed IL-1R1 in response to PN suggesting ILC2s directly respond to IL-1 alpha released by lung epithelial cells after PN inhalation. Additionally, we are developing a protocol to visualize lung ILC2s using confocal microscopy. Future studies using both flow cytometric and microscopic approaches will enable us to further understand how sex differences impact activation of ILC2s against PN.

Dana Dubas

Mentor: Joseph Dolence

Co-Authors: Tyler Shaner, Sunanda Rajput, McKenna Vininski, Nicholas Hobbs, Joseph Dolence

Title: *Examining how sex differences influence the ability of neutrophils and dendritic cells to mount response following inhalation of PN*

Knowledge of how innate immune cells respond to peanut (PN) to elicit PN allergy remains incomplete, especially how sex differences impact the ability of these cells to respond to PN. This study compared male, female, and androgen receptor-deficient (ARTfm) male mice exposed to PN via inhalation in 3-day mouse models to elucidate how sex differences impacted the response of neutrophils and dendritic cells (DCs) to PN. We found that DCs, but not neutrophils, responded following PN inhalation. We

further studied DCs by examining CD103+ CD11b- cDC1s and CD11b+ CD103- cDC2s, two DCs shown to capture PN following inhalation in mice. cDC1s and cDC2s were found to express IL-1R1 in response to PN. IL-1R1+ cDC1s responded to PN in WT male and female, but not in Tfm male mice. IL-1R1+ cDC2s reacted to PN in WT male and female, along with displaying a more abundant response in Tfm male mice. We are currently expanding this study to examine whether these DC populations are impacted following 11 days of PN inhalation to investigate how sex differences impact the response of DCs at a time point just before PN-specific adaptive responses begin to elicit PN-specific IgE. Collectively, this data suggests that IL-1R1+ cDCs play an important role in response to PN, likely activated by IL-1 alpha released by lung epithelial cells after PN inhalation. The differential response of cDCs in the Tfm mice suggest that male sex hormones, namely androgens, play a role in regulating the ability of DCs to mount initial response to PN.

McKenna Cruikshank

Mentor: Austin Nuxoll

Co-Authors: Caleb Rother

Title: *Characterization of Staphylococcus lugdunensis biofilms through ethyl methanesulfonate mutagenesis*

Staphylococcus lugdunensis, which, not unlike *Staphylococcus aureus* and *Staphylococcus epidermidis*, can be found on human skin as normal flora. *S. lugdunensis* has recently been implicated in biofilm-mediated infections, such as endocarditis and severe prosthetic joint infections. To identify important factors involved in biofilm formation, *S. lugdunensis* was treated with ethyl methanesulfonate (EMS) and individual mutagenized cells were isolated through cell sorting. Low biofilm formers were sequenced and a mutation in the gene, *slsA*, which codes for a surface protein was found to be common among all mutants with decreased biofilm formation. To confirm that *S. lugdunensis* forms a protein-mediated biofilm, it was treated with proteinase K. Treatment of 100 µg/mL Proteinase K for 90 minutes resulted in dispersal, further suggesting proteins are an important component of *S. lugdunensis* biofilms. Additionally, low biofilm formers from the EMS screen were stained with Concanavalin A, SYPRO ruby biofilm matrix stain, and DAPI to monitor whether the decreased biofilm formation was associated with protein reduction and not due to polysaccharides or eDNA being altered. Due to its role, the *slsA* gene is a good candidate for further study. Currently, a *slsA* knockout is being constructed to confirm its role in biofilm formation in *S. lugdunensis*.

Mariam Garcia Escobar

Mentor: Austin Nuxoll

Title: *Characterizing High Persister Phenotypes in Staphylococcus epidermidis Clinical Isolates*

Staphylococcus epidermidis is an opportunistic pathogen that typically resides within our normal skin flora and is primarily associated with causing disease in immunocompromised individuals. Often these infections are biofilm-mediated and associated with indwelling medical devices. Antibiotic treatment of these infections is often unsuccessful, leading to poor patient prognosis. One possible explanation for these observations is the presence of persister cells (a subpopulation of dormant cells). High persister isolates have been observed in other microbial pathogens such as Pseudomonas aeruginosa and Candida albicans. Recent work in the related pathogen, S. aureus, demonstrates that persister formation is dependent on energy depletion through the tricarboxylic acid (TCA) cycle. We hypothesized that high persister isolates occur in S. epidermidis clinical isolates through an energy-dependent mechanism. To further explore this, Drosophila melanogaster, the common fruit fly, was utilized to monitor survival and observe whether high persister cells have increased tolerance to components of the innate immune system. To observe the possibility of a correlation between high persister formation and a dysfunctional TCA cycle, extracellular acetate (as an indicator of TCA cycle activity) was measured in high and low persister isolates. Of the 17 isolates screened, seven correlated with high extracellular acetate concentrations and exhibited high antibiotic tolerance, and four of them exhibited low antibiotic tolerance. Preliminary data has demonstrated the correlational relationship between a dysfunctional TCA cycle and increased persister formation. The project described was supported by an Institutional Development Award (IDeA) from the National Institute of General Medical Sciences of the National Institutes of Health under Grant # 5P20GM103427.

Naara Ramirez

Mentor: Yipeng Sui

Title: *The potential effects of an FDA-approved antidepressant Trazodone on dyslipidemia*

Cardiovascular disease is the leading cause of death. Many cardiovascular health problems, such as atherosclerosis, are caused by dyslipidemia. One xenobiotic nuclear receptor, Pregnane X Receptor (PXR), plays a significant role in atherosclerosis and dyslipidemia, and is activated by various environmental chemicals, including endocrine-disrupting chemicals (EDCs). EDCs are found in common household items such as plastics, medications, and food. Trazodone is a clinically used medication to treat depression by aiding in restoring the balance of serotonin in the brain. But it is

unclear if Trazodone has possible impacts on cardiovascular risk factors such as dyslipidemia. Our preliminary data suggested that Trazodone activated human PXR in both intestinal (LS180) and hepatic (HepG2) cells. We hypothesize that Trazodone could increase the cholesterol uptake mediated by PXR signaling. In this study we use cell-based transfection assay to evaluate the underlying mechanisms by which Trazodone activates PXR. We found that Trazodone was a more potent agonist of human PXR than mouse PXR. Trazodone could activate PXR more intensely in human liver cells compared with human intestinal cells. Our data suggested that Trazodone was a selective PXR agonist and promoted the dissociation between PXR and its nuclear corepressors. Next, we are to identify the key amino acid residues within PXR ligand binding pocket that interact with Trazodone by using computational docking study along with site-mutagenesis assay. Furthermore, we plan to estimate if Trazodone altered cholesterol uptake by human intestinal cells using fluorescence-labeled cholesterol. In the present research we explore the potential molecular mechanisms of how FDA-approved antidepressant Trazodone activates human PXR and increases the risk of dyslipidemia, which provides potential evidence on future cardiovascular disease risk assessment for Trazodone as well as other antidepressant drugs.

Sadie Cooley

Mentor: Nicholas Hobbs

Title: *Effect of Androgen Receptor on Over-Mark Preference in Male Mice*

Many terrestrial mammals, including mice, use scent marking to communicate with same- and opposite-sex conspecifics. A specialized form of scent-marking, called over-marking, occurs when one animal places its scent mark over that of a conspecific. This behavior may be used to indicate interest in potential mates or as a form of competition. Upon exposure to an over-mark made from the scent marks of two conspecifics of similar condition, rodents exhibit a preference for the top-scent donor over the bottom-scent donor. Many factors influence this preference for the top-scent donor of an over-mark, including the subject's diet and hormonal status. However, it is unclear what role androgen receptor (AR) plays in organizing and/or activating this behavior. Male mice lacking AR (testicular feminization mice (tfm)) Therefore, the current study tested the hypothesis that top-scent preference of male mice is affected by AR. Adult wild-type (wt) male and tfm male mice were isolated a week prior to behavioral testing to minimize social influences on their behavior. Subjects were then exposed to a simulated over-mark made from the urine of two wt female mice. Behavioral testing consisted of two separate phases: a 5-min. exposure phase and a 3-min. preference phase. The amount of time subjects investigated each scent mark during the preference phase was recorded to compute a preference score. The results of the current study may provide evidence to the role of AR in how mice respond to over-marks. Over-marks serve as a biologically relevant model of spatial memory.

Chemistry

Riley Grieser

Mentor: Haishi Cao

Co-Authors: Sharvani Regmi, Wryleigh Doyle, Mahesh Pattabiraman

Title: *Investigating the photophysical properties of 2 derivatives 1,8-Naphthalimide*

1,8-Naphthalimides (NIs) have been widely used as fluorescent molecules in biological, chemical, and medical fields because NIs show high stability and various fluorescence properties under different conditions. However, NIs typically display a fluorescence emission wavelength in the range of 350 – 550 nm, which can be notably interfered with by autofluorescence in living cells, significantly limiting their bio-applications. Moreover, low solubility in aqueous media is another major limitation for NIs. In this project, two derivatives of NIs have been synthesized via an aromatic nucleophilic substitution reaction and their photophysical properties have been investigated in various media (water, MeOH, MeCN, DMSO, EtOAc, and THF). These two derivatives could be used as excellent labeling reagents with a long emission wavelength in the biological system.

Physics, Astronomy, and Engineering

Mohammed Nour

Mentor: Brandon Marshall

Title: *Continuation of Infrared Bubble Investigation*

When a star reaches around 8 solar masses, growth shouldn't continue because the radiation pressure should push out the rest of the material it would use for more mass. This poses a problem because, clearly, we have found stars considerably more massive than 8 solar masses. What this means is that there has to be another process that high mass stars went through early in its history. One theory is that disks of material gravitationally bound to the star help keep material that would've been otherwise pushed out. The infrared bubbles found by the GLIMPSE survey could be evidence of this theory: young, hot stars pushing out material. Right off the bat, the fact that we can still see the bubbles and they haven't completely dissipated is a sign that these regions are still young, and the potential stars still have the remnant disk. The found bubbles are plentiful, so there is a wealth of data and photometry to sift through. A continuation from last year's project, this part of the project focused on gathering suitable bubbles to search for potential O-stars using the SED fitter. The fitter takes energy flux densities, determine a radius and effective temperature of the object, then plot that against expected values. Using their intersection, we can determine potential O-stars. Throughout the duration of the project, a total of 20 O-star candidates have

been identified within 14 bubbles. Using the determined spectral type of the star in combination with the size and other properties of the surrounding gas, we can estimate the age of the O-star. Cross-referencing the bubble's age with the disk destruction timescale of the particular subtype of the O-star can determine whether or not the bubble could be a product of the star.

Dylan Johnson

Mentor: Jeremy Armstrong

Co-Author: Neelam Shukla

Title: *Study of Electron-Impact Scattering of Tungsten Ions*

The study of electron-ion collisions is a prime area of research as it provides the fundamental understanding of the dynamical behavior of different atomic processes in high temperature plasmas. During collisions, electrons can interact with ions through different reactions such as electron-impact excitation (EIE) and electron-impact ionization (EI). In the EIE process, the ions get excited through the collisions with highly energetic electrons followed by radiative decay. This radiation loss affects the plasma ignition process and stability. Conversely, the EI changes the charge state of the ions, thus affecting the radiative energy loss and ionization balance in the plasma. Accurate information of these atomic processes plays a significant role in plasma diagnostics. The present work reports the calculations of EIE and EI cross-sections for tungsten ions ($W27^+ - W29^+$) as tungsten will be the plasma-facing material in magnetic confinement devices like the ITER tokamak. These ions are selected from the recent experiment performed at NIFS, Japan. The calculations are performed using the relativistic method, and the required wave functions are calculated using Multi-Configuration Dirac-Fock method through GRASP2k, and Flexible Atomic Code. The accuracy of these wave functions is ascertained by comparing the transition energies and oscillator strengths with the previously reported measurements. The calculated cross-sections of these tungsten ions are going to be the primary inputs for the ITER fusion plasma diagnostics.

Graduate Posters – Online and In Person

Fine Arts & Humanities

Communication

Poster Online – Kattie Sadd

Mentor: Tiffani Luethke

Title: *MENA Women PhotoVoice Project*

The purpose of this study was to better understand Middle Eastern and North African (MENA) refugee women who have relocated to the United States. Specifically, the challenges they face during their transition, and their strengths as individuals joining a society. The refugee crisis in the MENA region is ongoing, and intense (Kira, et al., 2014). As a host country, the U.S. can implement better integration processes for these refugees to help them transition into their new lives and promote their abilities. To further investigate the strengths and challenges of MENA refugee women we used PhotoVoice, a form of community based participatory research, to capture their stories and experiences in photos. With photographs and group discussion transcripts as qualitative data, we generated findings through the inductive process of thematic analysis.

As a research assistant, I helped with IRB approval paperwork and flyers for this project. I also worked with our team to code the data from the group sessions held with participants using thematic analysis. I searched for relevant literature on this topic to construct a literature review about the strengths and challenges of MENA refugees. After extensive research, it was clear that more research is necessary to better understand the experiences of MENA refugees who relocate to the U.S. This research is important to help create long term solutions that will make the reintegration process easier for MENA refugee women, now, and in the future. By conducting this vitally important research, we hope to help refugees who resettle in the U.S. receive lasting support and the resources they deserve to live happy and healthy lives.

Poster G1– Gwendolynn Folk

Mentor: Mary Harner

Title: *Communicating Biology Concepts in a Local Context in Central Nebraska*

Outdoor learning has a multitude of benefits for students. Kearney is fortunate to have the Kearney Outdoor Learning Area (KOLA), a place specifically designed to facilitate outdoor learning, located next to Kearney High School (KHS). KOLA includes a variety of instruments to monitor change, including a time-lapse camera that captures views of the landscape. An overall goal of monitoring is to help make KOLA a more usable teaching and learning environment for high school students. For this project, I developed a lesson about observing the phenology of a cottonwood tree located in KOLA, as depicted by time-lapse photography at the site. I created phenology calendars based on imagery collected in autumn across three years and developed an activity for KHS sophomore biology students based on these calendars. Students were asked to observe images of a specific cottonwood tree and pinpoint when the tree had 100%, 75%, 50%, 25%, and 0% of its leaves across three years. In this poster, I highlight the approach used and the outcomes of the phenological observations. Overall, I want to understand whether the calendar is an effective tool to illustrate timing of leaf fall or if it needs adjustment to be more useful for a lesson. Through activities such as this one, I hope to introduce students to KOLA, observations of landscape change with photography, and science that can be done in their own backyard.

Natural & Physical Sciences

Biology

Poster G2 – Sunanda Rajput

Mentor: Joseph Dolence

Co-Authors: Alethia Henderson, Leigh-Anne Lehmann, Nicholas Hobbs

Title: *Sex Differences in Innate Immune Response Following Peanut Exposure*

Knowledge of the immunological mechanisms involved in the development of peanut (PN) allergy remain unclear. Analysis of US adults showed that females were twice as likely to develop PN allergy during childhood, indicating sex hormones may regulate PN allergic responses. This study aims to understand the role of sex hormones in the response of mast cells (MCs) and Type 2 innate lymphoid cells (ILC2s) to PN. Previously, androgen receptor-deficient (ARTfm) mice showed higher PN-specific antibody and worse anaphylactic response to PN than WT males. WT males also displayed less severe anaphylactic response compared to ARTfm and WT females. We examined whether sex differences impacted the response of lung and peritoneal cavity MCs after 3-day inhalation exposure to understand how MCs initially respond to PN. Activated MCs have been shown to further activate ILC2s. Whether this occurs following PN exposure is unknown. After 3 days, we found no sex difference in lung and peritoneal MCs population in WT male, female, and ARTfm mice even though we showed ILC2s display a greater response to PN in female mice. To understand further, we used an 11-day PN inhalation model to investigate how sex differences impacted the response of lung ILC2s and MCs at a time point just before PN-specific adaptive responses begin to elicit PN-specific IgE. We found slight activation of the MC population in lung. Most striking however, was our finding that PN-activated ILC2s at 11 days displayed increased expression of TNFR2, suggesting MCs and ILC2 work together to drive PN-specific allergic responses. Recent studies have suggested that MCs work to further activate ILC2 through TNF-alpha. However, this connection has not been shown to drive immune responses to PN. Future studies will examine whether TNF-alpha produced by mast cells following PN exposure activates ILC2 in a TNFR2-dependent manner. Taken together, this data allows us to better understand the role of these cells in driving PN allergy. Such information is critical to develop novel therapeutic avenues for patients suffering from PN allergy.

Professional & Applied Studies

Communications Disorders

Poster Online– Hannah Zimmerman

Mentor: Jane Roitsch

Co-Authors: Whitney Schneider-Cline, Laura Moody, Amy Nebesniak

Title: *Loper Launch Speech Academy: Changes in Campers Self-Perception*

Introduction: Research has shown multiple benefits of summer educational programming or summer workshops. The most significant impact of the summer workshops is the reduction of summer learning loss or “summer slide.” To help combat the summer slide, UNK provides the five-day Loper Launch Speech Academy camp for students entering grade 1-4 who have been identified as having speech and language disorders.

Purpose: We wanted to know what campers thought about their speech and language before and after they completed the Speech Academy. Specifically, we wondered what changes, if any, would be reported by elementary students’ perceptions of their speech and/or language disorders following a curriculum-based, hands-on summer camp for students with speech and language disorders.

Participants: 14 speech therapy campers, entering grades 1-4, completed a pre-camp survey prior to the start of the camp and a post-camp survey given at the conclusion of the camp.

Methods: Descriptive statistics, frequency, and percentage were reported for all study variables. Mixed models were estimated to understand how the responses changed between the pre and post camp surveys. Mixed models were chosen as the analytic method as they can appropriately handle data structures associated with repeated measures. Due to the small sample size, responses were categorized as agree vs. disagree for modeling. Post hoc comparisons between pre and post surveys were conducted within the model via orthogonal contrasts. A p-value < 0.05 was used to determine statistical significance.

Results: While none of the comparisons reached statistical significance, agreement towards each statement increased post camp compared to pre camp. In addition, agreement to the statement “I was happy to be at Loper Launch and work on my speech” was approaching statistical significance.

Poster G3 – Preston Davis

Mentor: Philip Lai

Co-Authors: Philip Lai

Title: *Gesture Use in Parents of Children with Autism Spectrum Disorder during a 25-Minute Play Task.*

Children with Autism Spectrum Disorder (ASD) have significant social communication impairments that interfere with everyday life skills. According to the Centers for Disease Control and Prevention, ASD affects an estimated 1 in 36 children in the United States (Maenner, Warren, Williams, et al., 2023). One area gaining attention in ASD research is the role of parents and their effectiveness in providing interventions and treatments to their child in their homes. This line of research is especially pertinent due to the current pandemic, where social distancing measures have severely impacted families access and interactions with allied health professionals (Manning et al., 2020). There is a critical need for studies to investigate, for example, the effectiveness of social interaction by exploring variables from both the parents' and the child's perspective. In this research study, a pattern of communication is emerging in how parents are utilizing gestures during a social interaction. Preliminary results suggest gestures maybe used as an additional communication channel during a 25-minutes play task. Future research will explore if gestures are being used as a primary communicative channel or if gestures are used in conjunction with speech in both groups of children. In addition, gesture complexity will be evaluated to see not only the quantity, but the quality of gestures being produced.

Poster Online – Julia Engel

Mentor: Ladan Ghazi Saidi

Title: *Cognitive Health in Rural Populations*

With an increased population of older adults nationwide, an important question is whether living environment affects cognition. Evidence supports that rural populations experience higher rates of chronic conditions and morbidities such as hypertension, diabetes, obesity, and a sedentary lifestyle which all increase the likelihood of cognitive impairment as compared to their urban counterparts (Steinberg et al., 2022). The aim of our study is to compare cognitive health in rural (< 10k) micropolitan (10k-50k) and urban populations (>50k) and determine the different factors that may impact cognition in each environment. Methods: Participants are at least 60, have access to an electronic device and the internet, easily follow directions, speak English as a primary language and be a United States resident. Participants are recruited via flyers and social media. Assessments: All participants are consented. A survey is sent to each participant to gather details about their background and lifestyle. The cognitive status

of participants is assessed using the Montreal Cognitive Assessment (MoCA), a short cognitive impairment screener. Data analysis: This is an ongoing study. The data will be analyzed using SPSS for description statistics, and the MoCA scores will be compared between the three groups using ANOVA. Results and Discussion: MoCA scores among the three groups will be discussed in the context of their living environments. The results of this study will shed light on the impact of the environment on cognitive health and the environmental factors affecting cognitive health at aging.

Counseling School Psychology and Family Science

Poster Online - Brenna Erdman

Mentor: Doug Tillman

Co-Authors: Rachel Rehtus

Title: *New Challenges: Recent Updates to Title IX and Implications for Counselor Education*

Title IX and the Clery Act are two federal policies that include stringent reporting requirements related to sexual harassment and/or sexual violence. Further, they require faculty to divulge personal information of students to university officials if they disclose this type of information. With the 2014 Violence Against Women Reauthorization Act, the Clery Act expands reporting beyond sexual assault to include dating violence, domestic violence, stalking, and all types of hate crimes regardless of if the perpetrator was convicted. This presents challenges to counselors working in university settings where clients may share this type of information and for counselor education programs where students participate in coursework and clinical training activities that focus on personal growth. Here incidents of this nature could easily be disclosed by students, or by the clients with whom they work in practicum and internship settings. In 2015, the authors presented an exemption policy for the above issues. Then in 2020, new additions to Title IX were published and the attorneys and compliance officers involved in the policy had left our university. A new compliance officer has been instated, and the previous exemption policy was rescinded. The process of seeking a new exemption began. Fresh from this policy being reinstated, we can share our policy and recommendations for other counselor education programs. To assure ethical practice, it is urgent that counselors and counselor educators become informed about these policies, the ethical challenges, and the necessary steps to take to collaborate with university officials to create counseling clinics and counseling departmental policies that will protect students and clients while syncing

with broader university policies and expectations for reporting requirements. Changes to mandatory reporting requirements may impact programs, and our experience with losing and reinstating our exemption policy will be shared to assist other programs who may encounter similar issues.

Poster G4 – Claire Nelson

Mentor: Sharon Obasi

Co-Authors: Emma Arens

Title: *Navigating the Digital Divide: Exploring Telemental Health for Young Adults*

Telemental Health (TMH) administered via video conferencing has become a widely popular method utilized by mental health providers since the COVID-19 pandemic. While previous research has highlighted its diverse benefits and drawbacks, TMH has garnered widespread acclaim among mental health providers for its efficacy in addressing various mental, behavioral, and relational concerns across different age groups, including pediatric, adolescent, and geriatric populations. Particularly in rural areas and diverse mental healthcare settings, TMH has gained traction due to its accessibility and efficiency. In addition to benefits, a number of professionals report several drawbacks to TMH therapy, referencing difficulties in building rapport and maintaining an authentic client-therapist relationship through virtual means, concerns regarding client confidentiality, safety, and challenges with the implementation of traditional therapeutic techniques. Despite the utility of virtual meeting applications, several providers express great apprehension with the use of videoconferencing, in terms of securing a private, safe space for sessions, and treating clients who experience heightened risks for self-harm. As mental health professionals continue to debate the effectiveness of TMH therapy and assess the long-term implications of such methods, there remains a lack of current data on the use of virtual therapy in the post-pandemic world, specifically among individuals of ages 19-25. This review aims to address this gap by exploring the perspectives of present-day mental healthcare providers and offering insight on the efficacy of TMH therapy for the treatment of young adults. By examining the experiences and challenges faced by this demographic, we can better understand the potential of TMH to meet the evolving needs of mental health care delivery.

Poster G5 - Libby Yungdahl

Mentor: Tammi Ohmstede-Schmoker

Co-Authors: Kylie Janssen, Alexis Erickson

Title: *The Comparison of NASP and ISPA Ethics Codes*

The purpose of the code of ethics is to protect those who receive school psychological services and ensure appropriate, professional conduct of school psychologists. School psychology programs all around the world must recognize the importance of the code of ethics to ensure that all processes within the profession are being held to an appropriate ethical standard. The purpose of this study was to evaluate the extent to which ethical standards of the National Association of School Psychology (NASP) and the International School Psychology Association (ISPA) overlap. We conducted this study by recording the NASP and ISPA Ethics codes into a Microsoft Excel spreadsheet. NASP Ethical Principles were recorded into the first column of the Excel sheet. Then the ISPA Code of Ethics was recorded in the corresponding row, next to the similar NASP standard. The ISPA standards that did not align with any NASP standards were put in another column towards the bottom of the spreadsheet. The results were calculated by counting and calculating the percent of overlapping NASP 2020 and ISPA 2021 principles. Based on the information found in this study, there was a 22.2% overlap in NASP and ISPA ethics. We find that this study is significant because it is important to understand possible differences among school psychology practices in various parts of the world.

Poster G6 – Megan Garbe

Mentor: Tammi Ohmstede-Schmoker

Co-Authors: Chris Vera

Title: *School Psychology Interview Day*

The “School Psychology Internship Interview Day” is held on an annual basis and traditionally provided both internship candidates and school districts seeking school psychology interns an opportunity to be involved in several in-person interviews within one day. There was an increased number of school districts interested in internship interview day because of the statewide shortage of school psychologists. Due to the limited number of interns this year, we have modified the internship interview day to include a virtual internship fair for school districts who could not attend in-person. Both opportunities have afforded both internship candidates and school districts a chance to explore internship options and in many cases secure internship placements. The internship interview day has been in place for more than fifteen years with data being collected on the number of interns hired by school districts who attend the interview

day the past four years. Participants will learn about the process of coordinating a school psychology internship interview day and the positive outcomes

Poster G7 – Amelia Meyer

Mentors: Tammi Ohmstede-Schmoker

Co-Authors: Sierra Wilson

Title: *PrePaRE Training for School Psychology Programs*

It is imperative that school psychology graduate programs are not only equipping their students with the knowledge of the career field but also prepare them to be equipped to handle any crisis events or situations that may arise in their schools. The PREPaRE model, which is the National Association of School Psychologists' school safety and crisis response training curriculum. This study looks at the effectiveness of using the PREPaRE model to train school psychology graduate students to be prepared to respond to crisis events.

Kinesiology and Sports Sciences

Poster G8 – Carleigh Searle

Mentor: Kate Heelan

Co-Authors: Kate Heelen, Bryce Abbey, Roderick Bartee

Title: *The Impact of a Family Healthy Weight Program on Parent Participants Health Outcomes*

Purpose: In the United States, obesity is 6.2 times higher in rural areas compared to urban areas (Okobi et al., 2021). Rural areas have limited access to built environmental features, healthy food outlets, and commercial weight control programs (Befort et al., 2016). Building Healthy Families (BHF) is a rural Family Healthy Weight Program (FHWP) for 6–12-year-old children, with parent/guardian (parent) participation. The purpose of this study is to evaluate the effectiveness of BHF, an evidence-based, 12-week program on reducing body composition and clinical health indicators in parent participants.

Methods: Families with at least one child with a BMI \geq 95th percentile for age and gender enrolled in BHF and attended 12 weekly group-based sessions covering nutrition education, physical activity, and lifestyle modification education. Parents' age, weight, height, blood pressure, and body composition (DXA) were assessed at baseline, 12 weeks, and 6 months. Blood lipid profiles and liver enzymes were assessed at baseline and 6 months for parents with a BMI \geq 30.

Results: 84 families initiated participation (n=137 parents: 55 males (BMI=33.74 ± 7.47 kg·m⁻²), 82 females (BMI=33.18 ± 7.86 kg·m⁻²)). 108 parents completed 12-week assessments and 68 parents completed 6-month assessments. Parents had significant improvements in body mass (-6.65 ± 4.72 kg), BMI (-2.15 ± 1.78 kg·m⁻²), body fat (-3.43 ± 2.90 %), fat mass (-5.24 ± 3.46 kg), systolic blood pressure (-4.01 ± 9.43 mm/Hg), and diastolic blood pressure (-2.61 ± 8.12 mm/Hg) from baseline to 12 weeks (p<0.05). Continual improvements were found at 6 months in body mass, BMI, body fat, fat mass, systolic blood pressure, in addition to improved ALT, and total cholesterol (p<0.05).

Conclusion This study demonstrated that BHF can produce significant improvements in body composition and clinical health indicators in 6 months among the parent participants of the program.

Poster G9 – Gabby Loya

Mentor: Elena Robinson

Co-Author: Jodan Dillie, Elena Robinson

Title: *Effects of High-Fidelity Simulation on Athletic Training Students' Perceived Knowledge of Airway Adjunct Usage*

Context: In accordance with programmatic and national certification standards, athletic training (AT) students must be prepared to provide prompt and appropriate emergency care for various conditions. Some conditions such as breathing or airway difficulties, may have low incident rates, yet are critical in nature. High-fidelity simulation may provide an effective real-world experience that allows AT students to increase knowledge in such critical skills.

Objective(s): The aim of this study is threefold. First, we want to determine if the use of high-fidelity simulation, using the ALEX Plus 2.0 simulator (Nasco Healthcare Inc., Saugerties, New York), affects perceived knowledge of airway adjunct usage. Second, we want to measure differences of perceived knowledge between cohort levels of athletic training students. Lastly, we want to determine long term effects of simulation on the perceived knowledge of airway adjuncts in athletic training students.

Design: Quasi-randomized control trial with repeated measures.

Patients or Other Participants: Convenience sampling of graduate athletic training students (n = 16) enrolled in a professional program at a National Collegiate Athletic Association Division II university in the Midwest. After participants provide consent, participants will be randomized into two groups: skill check group and the simulation group.

Intervention(s): All participants will be provided with a 30-minute lecture on airway adjunct usage. Then participants will either complete a guided skill practice session on the simulator or participate in a high-fidelity rescue breathing simulation.

Main Outcome Measures: A perceived knowledge questionnaire (PKQ) will be completed by participants before and immediately after the interventions of skill check session or simulation. The PKQ will also be completed 6 months after the allotted intervention is completed.

Results: A one-way ANOVA will be used to assess differences of pre, post, 6-month post differences between groups and the impact of cohort levels within groups.

Poster G10 – Christina Nelson

Mentor: Elena Robinson

Co-Author: Elena Robinson

Title: *High-Intensity Laser Therapy Improves Scar Maturation of Surgical Wound from Carpal Tunnel Release Procedure: A Case Study*

Background: Laser photobiomodulation (PBM) is a non-invasive light therapy that can be used to treat a variety of conditions. One class of PBM lasers, high-intensity lasers (HILT), has been proven to stimulate cells, increase cell energy, and stimulate pain receptors for wound care. Few studies have evaluated the effects of HILT on post-operative wound healing. This case study presents how HILT may improve the quality of healing in post-operative incisions.

Patient: A 25-year-old female had suffered bilateral burning, tingling and numbness throughout both arms that affected daily life for about 1.5 years prior to this study. An initial assessment of an MRI of the cervical spine was unremarkable but a sensory nerve conduction study revealed poor bilateral median sensory nerve responses with the left median motor response showing greater prolonged latency. An orthopedic assessment revealed no masses or lesions of the wrists and hands, no thenar atrophy, and a bilaterally positive carpal tunnel compression test.

Intervention: The patient underwent an open carpal tunnel release surgery of the left side first. Stitches were removed after 11 days, and the patient completed standard home exercises for 3 weeks. About 1 year later, the physician repeated the operation on the right wrist. The patient completed a standard post-op protocol but also received treatments of massage therapy and HILT. Treatment began once the stitches were removed (12 days), and a final scar assessment occurred 6-months post-op.

Outcomes: Along with a standard rehabilitation protocol, HILT was implemented with massage therapy. The patient progressed appropriately with motion and strength and

fully returned to full activity after 6 weeks of therapy. Some differences in wound healing characteristics at 16 and 18 days post-op were noted, but the 6-month follow-up revealed remarkable differences of improved texture, color, shortened length, and margin formation of the right wrist compared bilaterally.

Conclusion: This case study showed an improvement of color, texture, and margin formation of an incision scar with the application of additional treatments such as HILT. Particularly, this case presents notable long-term differences in bilateral carpal tunnel release scars.

Poster G11 - Falan Ryan

Mentor: Elena Robinson

Title: *Emergency Cardiac Preparedness in Rural High Schools*

Context: Sudden Cardiac Arrest (SCA) is becoming more prevalent in young athletes, enquiring public resources to be available. Automated Electrical Defibrillators (AEDs) when used during SCAs increase your survival rate by 4 times. However, when evaluating SCAs rates and their interventions, AEDs are used only about 10% of the time before Emergency Medical Services arrive in private or public settings. Some initiatives such as Project Adam were created to help address cardiac preparedness in schools. School administration can apply to be evaluated by Project Adam and be considered a "Heart Safe" school which indicates an appropriate preparation in cardiac safety. In the state of Nebraska, 11 schools are considered Heart Safe. Most of Nebraska's Heart Safe schools are located in metropolitan areas, which leaves concerns for the rest of the state's schools. This study's purpose was to determine resources, training, and knowledge available to Nebraska rural schools that will help with the survival of those who may suffer from SCA.

Methods: Survey questions were developed based on a previously validated survey through Project Adam: Project ADAM Heart Safe School Program Checklist. The survey was built in Qualtrics, and questions addressed the following categories: school demographics, AEDs availability, cardiac emergency response team, cardiac emergency response team plan, training, and cardiac emergency response team drills. Schools from all rural Nebraska counties were selected. Rural counties were defined by the US Census Bureau as those that are not micropolitan, county/counties with one urban area of 10,000-50,000 people, or metropolitan, county/counties with one urban area of <50,000 people. Athletic Director's emails were collected through the Department of Education and school websites, 148 ADs. The survey link was

anonymously sent to each ADs email. Reminder emails were sent every week during the month that the survey was open.

Poster G12 - Gabrielle Oborny

Mentor: Kazuma Akehi

Title: *Analyzing Lower Limb Joint Kinematic Changes Across the ACL Reconstruction Rehabilitation in High School and Collegiate Student Athletes*

Context: Patients perform dynamic and functional knee rehabilitation early after ACL reconstruction surgery. However, mechanical deficits could be present on the reconstructed side and the non-reconstructed side due to the thigh muscle atrophy and lack of motor unit activation. The purpose of this study was to determine what mechanical deficits are present in athletes who have had ACL reconstruction surgery during unilateral exercises. Methods: Seventeen college-aged athletes (age = 20.35 ± 4.20 years, height = 175.59 ± 12.42 cm, body mass = 79.76 ± 19.31 kg) who have undergone ACL reconstruction surgery completed the study. Participants performed dynamic single-leg exercises such as single-leg squat, single-leg jump, and lateral lunges on the marker-less 3D motion capture system. Joint kinetic and kinematic data such as the ankle, knee, hip, and trunk ROM ($^{\circ}$), dynamic knee valgus angle ($^{\circ}$), weight distribution (%), peak torque production (N) at each joint, ground reaction force (N), jump height (in.), flight time (s), rate of force development (RFD; N/s) at the time of jump, peak power (W) and net impulse (Ns) at takeoff were analyzed. Results: There were significant differences between ACL reconstructed limb and healthy limb on jump height ($P=0.012$), flight time ($P=0.035$), RFD ($P=0.047$), peak power ($P=0.015$), and landing knee valgus ($P=0.04$) during single-leg jump. However, no significant differences were observed for the other joint kinetic values and single-leg squat and lateral lunges. Conclusion: The findings of this study highlight that single-leg jump task may be a key exercise to identify the dynamic joint mechanical deficit during ACL reconstruction rehabilitation. Identification and limitation of dynamic joint deficits during the rehabilitation process are crucial to determining a safe return-to-play. Athletic trainers can use this information by teaching and training appropriate jumping techniques during rehabilitation. Further studies are needed to reveal other exercises to improve the rehabilitation process after ACL reconstruction surgery in student-athletes.

Poster G13 - Ethan Twohig

Mentor: Kazuma Akehi

Title: *Effects of High-Intensity Laser on Tissue Response Following Delayed Onset Muscle Soreness*

Context: High-intensity laser therapy (HILT) is one of the newest innovations in treating musculoskeletal pain. Previous research with low-level laser therapy (LLLT) has shown a reduction in musculoskeletal pain. However, the study with HILT is limited. Objective: The purpose of this study is to evaluate the effects of HILT on tissue response to clinically induced Delayed Onset Muscle Soreness (DOMS). Pain scale and muscle architectural characteristics will be analyzed to examine the effects of HILT on tissue healing response. Study design: Randomized control trial applying HILT as the only independent variable. Participants: Twenty individuals (10 male, 10 female) between the ages of 19 and 25 will be recruited for this experiment. Procedure: Participants will complete a personalized fatigue protocol using the isokinetic dynamometer to induce DOMS. Upon completion of the fatigue protocol, participants will complete a pain scale and measure muscle architectural characteristics (muscle thickness and muscle quality) using a diagnostic ultrasound on both the fatigued and control quadriceps muscle. The participants will then receive either HILT or pseudo laser treatment for three consecutive days. Before and after each treatment, a pain scale and muscle architectural characteristics will be performed. Data between groups will be compared. Clinical Application: The results of this study will provide better clinical insight into the use of HILT to treat musculoskeletal injuries and the pain associated with them. Additionally, this research may show the acute tissue response to HILT.

Poster G14 - Yuki Arai

Mentor: Elena Robinson

Title: *Utilizing Dry Needling in the Rehabilitation of an Athlete Following Multi-Ligament Knee Injury: A Validation Case Study*

Background: Dry needling is an invasive therapeutic modality technique that involves inserting a thin needle through the skin and stimulating tissue such as myofascial trigger points for therapeutic results. Literature has revealed positive effects from the use of dry needling, including pain management associated with muscle pain and patient-reported reduction of muscle spasms. This case study shows how dry needling can benefit a patient's rehabilitation progression after sustaining a multi-ligament injury and surgical repair.

Patient: The patient is a 23-year-old male college football offensive lineman. A traumatic mechanism of injury occurred to his right knee during a competition that led to a ruptured patellar tendon and anterior cruciate ligament, as well as medial and lateral meniscus damage. The patient did not report any other significant medical history.

Intervention: Surgical intervention was used to complete a patellar tendon repair, medial meniscus repair, and lateral meniscus repair on his right knee. Rehabilitation started 18 days after the surgery. It included therapeutic exercise, neuromuscular re-education, manual therapy, electrostimulation, vasopneumatic therapy, and iontophoresis in the first 5 weeks. Dry needling was then added to release tension throughout his quadriceps tendon and quadriceps muscles. Dry needling was performed about 4 times throughout weeks 6 and 7 of the rehabilitation plan. After that, the rehabilitation proceeded without dry needling.

Outcomes: Using dry needling 4 times in 2 weeks in conjunction with rehabilitation in this post-surgical athlete assisted with releasing tension within his quadriceps tendon and muscle and decreased pain. However, the total range of motion did not change significantly.

Conclusion: This case study showed that dry needling can be an effective intervention for relieving muscle tension in the early phases of healing and decreasing pain for the patient.

Poster G15 – Britney Brosius

Mentor: Kazuma Akehi

Title: *Effects of Blood Flow Restriction Training on Motor Unit Recruitment*

Context: Blood-flow restriction therapy (BFR) is used to improve healing processes in patients who cannot use heavy strength training loads, especially after an orthopedic injury. BFR works by placing a cuff around the proximal end of the exercising limb and inflating it to reduce blood flow, which creates a hypoxic environment for enhanced metabolic functions. This technique has been shown to improve muscle mass, function, cardiovascular performance, pain outcomes, power output, and neuromuscular adaptations. **Purpose:** The purpose of study was to analyze the muscle fiber recruitment effects of BFR training in college-aged students. **Methods:** Ten college-aged healthy individuals (age=22.4±1.5 yrs) were split into two groups, control (CON) and intervention (INT). Participants performed three repetitions of maximal voluntary isometric quadricep muscle contraction for three seconds. Motor unit recruitment (MUR) and peak torque (PT) of the right rectus femoris muscle were measured using surface electromyography (EMG) at baseline, 2-week, and 4-week of

the intervention. Between measures, INT performed a set of exercises using BFR three times a week. Differences between baseline, 2-week, and 4-week MUR and PT measurements were compared between CON and INT. Results: There were no statistical differences between MUR and PT in CON and INT groups across the intervention ($P>0.05$). Conclusions: BFR is a growing therapeutic technique used in the early stage of rehabilitation in Sports Medicine. However, there is little consistent research on muscle fiber recruitment outcomes. The current study used a healthy young population to examine the effect of BFR. Further research is needed to examine the MUR effects of BFR following orthopedic injury.

Poster G16 – Sierra Rohs

Mentor: Kate Heelan

Co-Authors: Kia Wilson

Title: *The Impact of Sleep on Energy Intake Among Mid-Western US College-Aged Females: A Pilot Study*

Purpose: There is mounting evidence people who get too little sleep have a higher risk of weight gain and obesity than people who get 7-8 hours of sleep a night (McMullen, 2020). Studies show an average of 300-500 extra calories consumed over 24 hours after limited sleep (McNeil, 2016). The purpose of this study is to determine if sleep impacts energy intake (EI) among midwestern US college-aged females.

Methods: Twenty-two college-aged females (21 ± 1.5 years; BMI = 24.93 ± 3.11 kg/m²) wore activity monitors (Fitbit™ or Applewatch™) on their wrist for three 24-hour periods recording total sleep time and daily energy expenditure (EE). During the same 3 days, participants kept a food diary using MyFitnessPal™ to record EI. Days recorded were divided into LOW sleep days (≤ 7 hours) and HIGH sleep days (≥ 9 hours). A T-test was used to compare EI between the LOW and HIGH sleep days and evaluate differences in EI and EE.

Results: 66 total days of measure were evaluated; the average sleep was 7.78 ± 1.29 hours/night. Results showed 18 LOW sleep nights (6.4 ± 0.7 hours) (EI: $1,795\pm 713$; EE: 2628 ± 668 kcals/day) and 11 HIGH sleep nights (9.8 ± 0.8 hours; EI: $1,683\pm 478$; EE: 2274 ± 330 kcals/day). Overall, there was no significant difference between the LOW and HIGH sleep nights for EI. However, on LOW sleep days participants significantly underate (-708 ± 667 kcals) compared to HIGH sleep days (-324 ± 665 kcals/day).

Conclusions: Although no significant difference was found in energy intake between the LOW and HIGH sleep groups, college-aged females appear to get adequate sleep but are not eating adequate calories compared to their expenditure.

Contrary to previous research, participants ate less on LOW sleep days. Better measures of EE and sleep may be warranted for future studies.

Poster G17 – Clay Frels

Mentor: Kazuma Akehi

Co-Authors: Gabrielle Oborny, Kazuma Akehi

Title: *Validation of Estimated Ground Reaction Forces From 3D Motion Capture System with Measurable Force Plates*

Background: Force plate (FP) and 3D motion capture systems (MCS) have become common methods for testing performance in the athletic and rehabilitation setting. Both types of equipment provide metrics known as ground reaction forces (GRF); however, FP directly measures these GRFs, whereas MCS must calculate them based on the estimated segmental weights and heights. This poses the question as to whether the estimated GRF from MCS is valid in comparison to the gold standard FP. Purpose: The purpose of the study was to assess if the GRFs that are estimated by MCS are valid in comparison to dual FP during the countermovement vertical jump (CMVJ) and drop jump (DJ). Methods: Twenty-one recreationally active college students (age= 22 ± 1.04 yrs., height= 176.95 ± 8.96 cm., weight= 79.32 ± 14.88 kg) performed 3 CMVJ and 3 DJ within a DARI 3D MCS working in synchronous with Hawkin Dynamics dual FP. Results: After statistical analysis, it was found that there was a significant correlation between GRF metrics given by the MCS in comparison with the FP when performing a series of CMJ and DJ ($P < 0.01$). However, MCS underestimated the GRF at loading and landing during CMVJ and DJ ($P < 0.001$). FP underestimated jump height in CMVJ and DJ ($P < 0.001$). Conclusion: The GRF metrics estimated by the MCS in comparison with those measured by FP have significant correlations dependent upon individual variables. The data gathered from this study provided practical applications for assessing the GRF and other jump performance variables that are estimated from MCS versus those measured by dual FP. This data provided reliable results showing that dependent upon the variable, MCS estimates accurate GRF with a caveat of over-/under-estimation in comparison to directly measured variables from FP.

Poster G18 – Cassie McDonald

Mentor: Kazuma Akehi

Title: *Effects of a functional knee brace on the lower extremity kinetics and kinematics changes during dynamic lower extremity motions after the knee arthroscopic procedure.*

Context: The purpose of the study was to determine hip, knee, and ankle joint kinetics and kinematics changes during dynamic lower extremity motions wearing the functional knee brace in collegiate-aged individuals with a history of knee arthroscopic surgery. Methods: Six subjects (age=17.17±0.98 years, height=169.33±12.09 cm, body mass= 71.53±11.58 kg, month post-op= 8.67±2.50months) who have experienced the ACL reconstruction surgery (5-12 months post-surgery) and have their own custom-made functional knee brace completed the study. Each performed dynamic athletic motions in the three-dimensional motion capture system platform with or without their functional knee brace. Lower extremity joint kinematics values were analyzed. Results: Knee dynamic valgus angle during body squat was significantly different between the limbs wearing the knee brace and without the knee brace (P=0.025). The injured side of knee flexion ROM was considerably lower than the healthy side of the limb regardless of the knee brace during the single-leg jump (P=0.017). The knee brace did not influence each limb's ROM or muscle strength characteristics during other squat and jumping tasks (P>0.05). Conclusions: A functional knee brace significantly limited the knee lateral motion (1.7° vs -22.0°) during the body squat without affecting ankle, knee, and hip ROM and muscle strength characteristics. Although the participants complained about restricted ROM during the activities, this is not shown in the study. The restricted feeling may be due to the restricted valgus motion of the knee while using the knee brace, which then requires more muscle activation from the lower leg and hip muscles, as seen in previous studies. Elucidating these effects may provide important clinical information regarding facilitating these muscles in ACL rehabilitation and utilizing the functional knee brace in the early phase of the rehabilitation.

Poster G19 – Elise Volk

Mentor: Elena Robinson

Co-Author: Scott Unruh

Title: *The Dissemination and Re-Validation of a Student-Athlete Satisfaction of Care Survey Within Athletic Training Health Care*

Context: It is important for Athletic Trainers to be informed of their patient's satisfaction with their quality of health care because it can improve patient outcomes and overall clinical practice. Patient satisfaction assessments help athletic trainers develop the care that their patients desire and make changes in their practice to better serve them.

Athletic Trainers should be assessing patient satisfaction so they can best serve their patients by providing them with competent, coordinated care. Athletic Trainers should see these assessments as an opportunity to improve their skills and practice so they can become a better clinician. Athletic Trainers work in a unique environment that does not normally allow for patient satisfaction to be readily assessed as athletes do not choose who their provider is and typically do not pay for their services. This project's objective was to reassess a previously developed patient satisfaction questionnaire created in 1998 and observe the most effective ways to disseminate it.

Methods: The anonymous survey required participants to be 19 years of age or older and a student-athlete at the University of Nebraska-Kearney. Student-athletes were also asked to identify their sport, competition level, and gender. The remaining survey will ask specific questions about satisfaction of care within the domains of athletic training as well as yes/no questions on the general perceptions of overall care from the athletic trainer/staff. Three emails from the Assistant Athletics Director will be sent out over six weeks. The emails will prompt student-athletes to fill out the questionnaire by either selecting an anonymous link or scanning QR codes hung around athletic facilities.

Poster G20 – Lucas Paloucek

Mentor: Kazuma Akehi

Co-Author: Kazuma Akehi

Title: *Nonsurgical Management vs Surgical Repair of Shoulder Labrum Tear for Competitive Student Athletes: Current Clinical Concept*

Introduction: A shoulder labrum tear is a common musculoskeletal issue in overhead-throwing athletes and contact sports. Conservative treatment can allow athletes to continue participating in sports but limit their shoulder range of motion (ROM) and athletic performance. In contrast, invasive treatments like shoulder arthroscopy repair the labrum tear but require them to restrict their athletic activity for 8-12 months.

Clinical Technique: Conservative treatment for shoulder labrum tears includes rest, physical therapy, and anti-inflammatory medication. Physical therapy exercises help strengthen the shoulder and scapular muscles. The invasive treatment consists of a shoulder arthroscopy. The surgeon either cuts out or trims frayed areas of the labrum or reattaches the labrum to the rim of the joint socket. The general outcome for a patient with shoulder labrum tears is to increase their ROM and decrease pain with movement using functional exercises used in everyday life and sports. Conservative treatment reported a better course of action, with a return to play rate of 78% in athletes with nonsurgical repair strategies, contrasting a 70% return to sports rate in athletes with surgical repairs like biceps tenodesis. The most used and successful rehab techniques/pain management methods for shoulder labrum tears include the Throwers Ten Program, joint mobilizations, and corticosteroid injections. These have allowed athletes to recover from rehab or continue competing with a tear.

Clinical Management Recommendation: Selecting the best action plan is essential when considering what is best for the athlete. Conservative treatments like the Throwers Ten program and pain management therapy are most efficient in terms of gaining strength, range of motion, and decreasing pain.

Poster G21 – Hannah Hardy

Mentor: Elena Robinson

Co-Authors: Scott Unruh

Title: *Emergency Medical Services Preparedness for Athletic Healthcare in Nebraska*

Context: Between 2021 and 2022, there were 65 catastrophic injuries related to sports activities reported, with a majority at high schools. Recent reports indicate varying availability of athletic training (AT) services in U.S. high schools, ranging from 13% to 90% of schools with access. Having an AT at a high school improves the standard of care given to athletes and improves communication with emergency medical services (EMS). In fact, high school ATs activate EMS more so than ATs in other settings, such as collegiate athletics. Within Nebraska, only 8% of rural high schools have a full-time AT, while 47% have none. If there is not a full-time AT, then EMS personnel will play a crucial role treating a variety of athletic medical emergencies. This study assessed the availability and readiness of EMS to provide healthcare at high school athletic events across Nebraska.

Methods: This study consisted of a survey sent to all EMS personnel in Nebraska. Subjects could participate if they were currently 19 years or older, and a licensed and actively working EMS professional in Nebraska. Recruitment of subjects involved obtaining 7705 EMS email contacts through public records from the Nebraska Department of Health and Human Services. All emails were placed in Qualtrics (Provo, UT) and an initial email was sent out to invite subjects to complete the questionnaire. The survey contained questions that pertained to demographics, distance of EMS to high schools, response time, and treatment of various injuries such as spinal injuries, heat illness, and concussions. Once the initial invite was sent, reminder emails were sent once a week for the next three weeks. The survey was open for 4 weeks total.

Results: A total of 1,459 responses were recorded (19%) with 1,145 completed responses (15%). Descriptive statistics will be used to analyze trends in the data.

Teacher Education

Poster G22 - Kelcie Burke

Mentor: Dawn Mollenkopf

Title: *Teacher Perception of Play in Early Childhood Education*

This is a mixed methods study using both quantitative and qualitative methodology. This study is designed to better understand teachers' perceptions and attitudes towards the intentional use of play to promote children's development and learning, and the extent to which these perceptions and attitudes affect how they use play in their classrooms. The data was gathered through surveys, interviews, and classroom observations of early childhood teachers in central Nebraska. These methods aimed to identify: 1) perceptions and attitudes about the use of play and its role for children's development and learning; 2) perceived or actual barriers teachers experience regarding their use of play in their classrooms, and 3) the amount of play in the classroom and how it is used. The survey was completed online using the UNK Qualtrics system and was comprised of 23 questions, most of which were multiple choice or chose all that apply. The interview was conducted via telephone or Zoom and was broken into two sections, classroom setup and personal views with five and ten questions, respectively. The observations took place over two sessions of two hours, or one four-hour session whichever worked better for teachers, two authentic environmental assessment tools were used to evaluate the classroom. The instruments used were the Early Childhood Environment Rating Scale (ECERS) and the Classroom Assessment Scoring System (CLASS). Thirteen teachers completed the online survey, eight of those participated in the 15-minute interview and six of those who completed the interview agreed to 4 (total) hours of observation in their classrooms.

Poster G23 – Chelsey Costello

Mentors: Dawn Mollenkopf

Title: *Pathways to Early Childhood Teacher Certification: A Data Analytics Approach*

The shortage of qualified early childhood teachers poses a critical challenge in education. Institutional barriers and evolving demographics further complicate the landscape. Utilizing archival data from a rural higher education institution, this study examines the trajectories of aspiring early childhood teachers and examines the shifting pathways to early childhood teaching certification. The methods of this study involved examining the length, sequence, and academic success (GPA, graduation rate) of preservice early childhood teachers. We categorized pathways into three streams: first-time freshmen, post-baccalaureate, and non-traditional students

(including transfers, returners, and late starters). Courses were classified into STEM, general education, and pedagogy. The findings of this study showed an increase in non-traditional students pursuing early childhood teaching while the number of first-time freshmen declines. First-time freshmen were most likely to graduate (92.6%), followed by transfer/adult students (84.8%), and post bac were least likely to graduate (66.7%). Non-traditional students (over 24) had a 76.3% chance of graduating even though their GPAs were similar to traditional students, indicating that the challenges were not just academic. The data also showed a decrease in GPA over time and that academic performance was best when exposed to a balanced mix of pedagogical, STEM, and general education coursework in the same semester; urban and rural students exhibit similar GPA and graduation rates. This study offers valuable insights into the complex pathways to early childhood teacher certification. By leveraging data analytics, it provides evidence-based recommendations for addressing teacher shortages and enhancing program effectiveness. Understanding the evolving landscape of teacher preparation is essential for shaping policies and practices that promote equitable access to quality early childhood education.

Poster G24 – Elizabeth Neukirch

Mentors: Marisa Macy

Co-Authors: Kelcie Burke, Dena Harshbarger

Title: *The Study of Professional Development on Staff Retention: A Review of Journal Responses*

Delegates from Nebraska and Florida traveled to Reggio Emilia, Italy in search of inspiration for their field of practice by being immersed in the nature-based Reggio Emilia approach through onsite observation and collaboration. Six journal prompts were utilized throughout the trip where participants documented their experiences with the delegation. Through analyzing journal articles, we evaluated how impactful a study abroad trip can be for not only your professional development but for personal and professional growth.

Poster Online – Katie Drake

Mentors: Phu Vu

Title: *Enhancing Online English Language Learning Through Google Translate: A Mixed-Methods Study in an Eighth Grade Integrated Science Classroom*

The proliferation of online learning environments has highlighted the importance of accessible educational resources for English Language Learners (ELL), who require tailored instructional strategies to achieve academic success. This study investigates the effectiveness of integrating Google Translate as a tool to support differentiated instruction, aimed at improving the educational outcomes for ELL students in an

eighth-grade integrated science classroom. Adopting a mixed-methods research design, the study evaluates the impact of Google Translate on ELL students' academic performance through a comparative analysis of pre- and post-test scores in integrated science. Additionally, the research explores qualitative data derived from anecdotal records to identify emergent themes related to the software's implementation, instructional modifications, and accommodations that facilitate the completion of classroom tasks and assignments. By examining both quantitative outcomes and qualitative insights, the study aims to provide a comprehensive understanding of how digital translation tools can enhance the accessibility of online learning for ELL students, thereby contributing to equitable educational opportunities and an improved learning experience. The findings are expected to offer valuable implications for educators seeking to implement technology-enhanced differentiated instruction strategies that address the diverse needs of ELL students in online learning environments.

Poster G25 - Kristen Wetovick

Mentor: Martonia Gaskill

Co-Authors: Martonia Gaskill

Title: *Undergraduate Students' Perceptions and Experiences with Artificial Intelligence (AI) in Education*

Artificial intelligence has made its way into educational settings amidst rising concerns over its efficacy and ethical usage. Kasneci et al. (2023) believe that AI is the key to innovation in education, and further discusses the benefits and challenges for both students and educators in navigating these technological advancements. The purpose of this mixed method study was to examine undergraduate students' perceptions of artificial intelligence within higher education. The study's participants were three hundred and thirty-one undergraduate students pursuing education-related majors at the University of Nebraska at Kearney. The study used an online survey powered by Qualtrics software for data collection. The online survey contained various question formats such as Likert scale, multiple choice, and open-ended questions. Quantitative data from the survey were analyzed using descriptive statistics and mean scores, while the qualitative data from open ended questions were analyzed using coding strategies to highlight key themes and trends. Results of the survey indicated that undergraduate students perceived artificial intelligence to be impactful in both positive and negative manners. Additional analysis determined that students' perceptions were predominantly negative in scope and depth. Participants emphasized that college instructors should talk about AI, encourage student exploration, and use AI themselves to model application and value in the education process. A gender imbalance in participation was noted, signaling the need for increased male representation. To enhance undergraduate participant diversity in the future, the scope of the study

should be expanded to encompass various institutions and across state boundaries to ensure a more comprehensive and inclusive representation of perceptions of artificial intelligence in higher education.

Poster Online - Amanda Green

Mentor: Phu Vu

Title: *Enhancing Early Childhood Development The Impact of Pyramid Model Practices in Head Start Classrooms*

This study investigates the integration and impact of Pyramid Model Practices within Head Start classrooms western Nebraska, focusing on children aged three to five. Through qualitative and quantitative analysis of ten classrooms with a combined enrollment of 132 children, including those with Individual Education Plans (IEPs) and identified Mental Health needs. The investigation focuses on the top five essential classroom practices identified for fostering social emotional learning (SEL): active learning, teachable moments, free choice time, outdoor activities, and group interactions. The study aims to demonstrate how intentional teaching of SEL, particularly during free choice time, can positively influence children's social-emotional growth, cognitive development, and physical well-being. By analyzing the teacher-to-child interactions, classroom environments, and specific SEL activities such as games, song singing, and story reading, this research seeks to provide insights into effective strategies for integrating SEL in early childhood education settings, thereby enhancing children's readiness for school and long-term academic success. The article concludes with a comprehensive synthesis of the findings, engaging in a detailed discussion on the implications of these results for the field of early childhood education. It also lays out a series of thoughtfully considered suggestions for future research endeavors, aiming to further explore and expand upon the initial insights gained from this study into the integration and impact of Pyramid Model Practices in particular and Social Emotional Learning in general in Head Start classrooms.

Poster G26 - Braelyn Verba

Mentor: Phu Vu

Title: *Connections Between Direct Kindness Instruction and Social and Emotional Success*

Many students across varying grade levels, cultural backgrounds, and socioeconomic status have social and emotional needs that can make learning difficult. In my second-grade classroom, I noticed a pattern of these unaddressed needs causing peer conflict as well as disrespect towards school property and personnel. Deficiencies in social

skills and/or emotional regulation skills were limiting our learning opportunities and negatively impacting the learning environment for all students. The intent of this targeted intervention was to use direct instruction to teach kindness and empathy using the Second Step curriculum and weekly kindness missions in order to provide students with the background knowledge needed to respond respectfully to others. I anticipated that this would lead to less conflict and promote positive relationships in and out of our classroom. The data used to assess the effectiveness of the intervention in this action research project was collected using the Social Academic and Emotional Behavior Risk Screener (SABERS). The intended goal was to see how the direct instruction of kindness and empathy would impact, and ideally protect, our learning environment. The findings from this research indicate a promising connection between Social and Emotional Learning (SEL) and prosocial behaviors as well as support the need for SEL curriculums to be more routinely integrated into the academic environment.

Poster Online - Sam Headley

Mentor: Phu Vu

Title: *Enhancing Engagement and Community in Online Learning: A Redesign of undergraduate level course with Social and Emotional Learning Principles*

This presentation outlines a strategic redesign of the undergraduate course TE 310/313—MathMethods I at the UNK College of Education, initiated under a course innovation grant aimed at enhancing online teaching and learning methodologies. The primary goal of the redesign is to elevate student engagement, encourage interactivity between peers, build community spirit, and incorporate effective digital learning tools where applicable. The redesign emphasizes the importance of community in boosting student engagement, which in turn significantly influences academic achievement and institutional retention. Key to this approach is the incorporation of Social and Emotional Learning principles—safety, security, value, and connection—to strengthen both student-to-student and student-to-instructor relationships, and to enhance students' confidence and willingness to engage in risk-taking for their educational and personal growth. The course will adopt indirect instruction with authentic assessment techniques designed to reflect students' interests and passions, to stimulate engagement and curiosity through the exploration of diverse peer interests. Authentic assessments will be implemented to evaluate academic rigor, gather student feedback, and promote critical thinking and problem-solving skills. The effectiveness of these pedagogical innovations will be assessed through observations and student feedback surveys, aiming to measure the impact of the redesign on student learning outcomes.

Poster Online - Claire Hofmann

Mentor: Phu Vu

Title: *Improving ELA Engagement in a Fifth Grade Classroom through Movement-Based Brain Breaks*

This individual action research study investigates the effectiveness of implementing short, movement-based brain breaks every 20 minutes within a 90-minute English Language Arts (ELA) block to increase student engagement in a fifth-grade classroom in Eastern Nebraska. While these students generally perform well academically, they struggle to maintain their engagement and focus throughout the lengthy block. This lack of engagement has led to lower academic achievement in Language Arts compared to mathematics. Using student-selected brain breaks, a 4-week intervention is implemented where students participate in a variety of 2-minute, movement-based, brain breaks every 20 minutes. Data collection includes weekly student interviews, daily engagement surveys, and weekly reading and writing assessments to track academic progress. These three factors are intended to track how the implementation of brain breaks affect engagement, participation, and academic performance. As the study is ongoing, this abstract will be updated with findings once the study is complete. The results and discussion of this completed study will be communicated to the school district and may lead to further research to include other content areas and grade levels.

Poster Online - Malaika Hanika

Mentor: Phu Vu

Title: *Teaching Mathematics and Technology with Integrity*

Technology. To some this word is scary, to others; exciting. What we didn't consider are the ramifications this word has on society as a whole and especially to future generations. The kids in school today have lived without the realization of technology and everything it can do. Since the beginning, technology has been getting more and more advanced, but with that also comes more danger to those that don't know how to use it. As teachers, we hear so much about how we need to incorporate more digital aspects in our classroom to engage our students. We learn about what we can do and what we should use, but we don't get taught necessarily about what we need to look out for. The same goes for students, they are given all this technology, but are they trained in how to use it, and do we teach them how to be safe on it? This is where my project comes in. I teach 7th and 8th grade students in the subject of math. I am taking classes to get my Masters in Learning, Design, and Technology and have learned a lot about tech and what it can do. Unfortunately, I have also learned how students can misuse it, and also how students can become targets through it. When I was growing up and while technology was gaining speed, I was taught how to use it as a typing

mechanism or a research tool, but never the dangers that can come with it. Firstly, as a teacher, I want to be able to give the students all the information so they are able to successfully implement it as a tool in their career fields. It wasn't until I started researching that I discovered just how much kids in school spend online. Not only did I want to make sure that I can give them the right tools, but the knowledge that I wasn't able to get when I was their age. More and more educators are assigning homework online and while it is more appealing to kids, that doesn't stop them from cheating. With all the information at their fingertips, how can we stop them from sacrificing their integrity in an ever-so-advancing technological world to do their work for them? Not only do I want them to learn the high stakes that comes with technology and the importance of using it properly, but also give them the chance to learn different math topics online. I will never shy away from technology because it does have so many benefits, but we as educators need to prepare our students in all aspects, which means technology as well.

Undergraduate Posters



Behavioral & Social Sciences

Criminal Justice

Poster U1 – Ella Waller

Mentors: Theresa Wadkins

Title: *Understanding the Motivations of Mass Shooters Across Time*

When mass shootings occur, society spends a great deal of time trying to find out what could motivate someone to commit such an atrocity, often resulting in unclear answers derived from clues left by the perpetrator or testimonies from those around them. This study focuses on the motivations of mass shooters, and how they have changed over time. With mass shootings being a real threat in the world we live in, it is important to look at past incidents to prepare for the future. While looking over different instances of mass shootings across decades this study hoped to gain an understanding of how and why these motives have changing as time goes on. By going over a selection of cases from pre-2000s and post-2000s, I have found that motivations have changed and are going in a more political direction than their predecessors.

Geography

Poster U2 – Jazmin Zamorano Morales

Mentors: Vijendra Boken

Title: *Agricultural Imports and Exports between Mexico and the United States*

Trade plays an important role in developing relations between nations. The United States and Mexico, along with Canada, share free trade agreements that benefit them, but to varying extents. The United States imports vehicles, electronic goods, oil and gas, and fruits and vegetables from Mexico while exports electronics, machinery, minerals, and grains and feeds etc. to Mexico. In this study, the past trend of agricultural trade between US and Mexico is examined. Data on agriculture trade was collected for 1993-2022. The trade consistently increased barring the COVID period that experienced decline due to labor and transportation issues. The study also addresses current dispute, such as relating to GM corn, between Mexico and the United States and offers suggestions to resolve them.

Political Science

Poster U3– Melisa Bercerra Gonzalez

Mentor: William Aviles

Title: *Gender-based violence in Columbia: The Role of Oligopolies of Coercion*

Aside from the infamous role that Colombia plays in the global drug trade, it is unfortunately a referential country that stands out due to the expansion of gender-based violence (GBV), specifically the unexceptional number of feminicides. Entering a new cycle of political violence, we are witnessing how the escalation of an informalized global economy hardly affected by the large-scale counter-narcotics efforts fostered by both the National government and U.S. involvement has facilitated the erosion of democracy, the rule of law, socioeconomic stability, and most importantly human rights. Some submit that these factors are inextricably linked to the proliferation of gender-based violence and thus, feminicides. Here, we explore Gustavo Duncan's concept of "Oligopolies of Coercion" referring to the confluence between criminal mafias and political authorities. Since these oligopolies have simultaneous and overlapping control of the means of coercion, they wield significant power over the social order, shaping factors such as consumption capacity and subcultures with specific regions. In this project, gender-based violence in Valle del

Cauca, Colombia, is analyzed using Duncan's argument to explore if the department's municipalities with the highest rates of GBV as social spaces correlate with the definition of Oligopolies of Coercion. While influential literature on the topic is centered on interpersonal acts and domestic factors, this study examines the role of various legal and illegal networks of capital accumulation focusing on oligopolies as an explanatory factor linked to the exacerbation of GBV and thus, the killing of women.

Poster U4– Macy Bryant

Mentor: Chuck Rowling

Title: *Analysis of Human Trafficking*

It is widely recognized that the issue of human trafficking is a global epidemic that continues to cross the lines of demographics such as race, wealth, and gender, and also takes place in most, if not all countries on Earth. According to the International Labour Organization nearly 27 million people worldwide are trafficked into forced labor. There is a large amount of international legislation concerning trafficking, from the international Convention for the Suppression of the Traffic in Persons and of the Exploitation of the Prostitution of Others, to the domestic Trafficking Victims Protection act in the United States and dozens more in between. Even with this extensive web of legal documents the booming, \$150 billion-dollar a year industry that is human trafficking continues to grow and thrive. This paper, along with data from various governments and anti-trafficking entities detangles the relevant information of this clandestine crime and realizes the necessary steps to be taken to combat trafficking and forced labor. After assessing the international and domestic laws, it is clear that prevention and education, prosecution and convictions, and finally victim protection and assistance, are commonly understood as the resolution or remedy to trafficking.

Poster U5 – Alexis Chavez Monasterio

Mentor: William Aviles

Title: *Force Relations and the Demise of Power Resistance from the Perspective of the American Migrant*

In past decades, the American migrant, and the conditions of their arrival at the southern border have changed drastically. Along with these changes has come a restructuring of the economy of power that has developed surrounding these migrants. Foucault saw the notion of power as a relational force that is exerted onto a body to influence their behavior. Here, two key points are important. First, Foucault argues that the forces that exert power become dependent on each other and that when power is exerted by institutions, they crystalize their relationships and structure, making them difficult to dismantle. Second, when all power is exerted, there is resistance from the opposing body. The power holders achieve overall stability of power or "domination"

when the resistance against the exerted power is diminished. In this paper, I explore the dynamics of these force relations and power resistance in the experiences of American migrants seeking to navigate and survive the crystalized power matrixes they face in their journey to the United States. The dynamics of these force relations display the crystallization of the relationship and structure of these institutions in their exertion of power over migrants.

Poster U6– Austin Dubas

Mentor: Satoshi Machida

Title: *Opinions of U.S. Foreign Policy*

My research project focuses on the possibility of a direct correlation in U.S. Foreign Policy that is affected by anticipated personal gains of the U.S. citizenry. The research is focused on how American citizens gain the will for interventionism in foreign policy that may result from their view of anticipated personal gain. The intent is for the research community to gain insight into people's views on foreign policy and look for any correlation between personal gains and foreign diplomacy. Recently, the United States public has been mixed on their views of global interventionism, which I believe can be linked to more personal reasons. Internationally and domestically, the people's views of foreign policy in international confrontations affects the entirety of the United States' ability for any global intervention. In this paper, it discusses a survey on U.S. citizens who are of 19 years of age or older. My survey asked 11 questions and took about 5 minutes. It was done over the Facebook app and was taken by many people. The correlation found in the study links benefits to protection of other countries. More specifically when seeking benefit in war U.S. Citizens are more likely to support foreign intervention.

Poster U7– Adam Everitt

Mentor: Peter Longo

Title: *Evaluating the Complex Issue of Gun Control*

Violence with guns presents a major public health issue in the United States of America, and it is a complex multifaceted issue. This project seeks to analyze this issue and possible solutions to enhance public safety amidst the complex landscape of social, cultural, and political influences. The evaluation encompasses considerations such as firearm regulation, accessibility, and education regarding proper usage of firearms. By examining current state gun laws, the history of gun laws, and international gun control this research aims to formulate strategies for mitigating gun violence effectively and ensuring citizen's rights stated in the Constitution of the United States. Because this issue is greatly politicized this research seeks to provide evidence-based policies that can help to reduce the amount of violence with guns while upholding the rights of US citizens.

Poster U8 – Ella Ferguson

Mentor: Peter Longo

Title: *Politics and Policy of Local Schools: A View from Nebraska Public Schools*

This undergraduate research project focuses on the politics and policy primary and secondary schools must compete with, with a focus on Nebraska public schools in particular. When it comes to this subject, federal and state law and policy along with school board decisions are often in competition, especially in times of high political divisiveness, forcing public schools to balance often conflicting rulings in their internal systems with minimal external aid and guidance to go along with new policies. This is a salient topic to learn more about due to the potential these bodies of authority have to affect daily educational proceedings. This topic will be approached through a focus of three relevant areas; these include public school funding, LGBTQ+ youth, and book and content restrictions. This research represents a complication of initial findings, to be built upon surveys that will be sent out to various K-12 public school districts in Nebraska.

Poster U9– Meah Loescher

Mentor: Peter Longo

Title: *Economic Impact of Cattle Processing Plants on Rural Nebraska*

Nebraska's cattle industry stands as a pillar of the state's economy, with its processing plants playing a vital role in both rural communities and the overall economic landscape. This research investigates the economic effects these plants have on the towns in which they operate and the state of Nebraska as a whole by utilizing literature and quantifiable data to explore the multifaceted impact of these facilities. My analysis examines employment rates, income levels, and business activity to assess the direct and indirect contributions of cattle processing plants to our local economies. The research delves into the social and economic dynamics of small towns where cattle processing plants operate as well, exploring the challenges and opportunities associated with the presence of these facilities, shedding light on issues like workforce development, infrastructure investment, and community development initiatives. Through my research review, I've discovered that Nebraska's cattle processing plants serve as economic anchors in small towns, providing steady employment opportunities, stimulating business growth, and bolstering household incomes. Moreover, these plants contribute to the state's competitive advantage in the agriculture sector and drive export opportunities. However, the research also uncovers challenges and concerns, including workforce shortages, environmental impacts, and fluctuations in market trends. Addressing these challenges requires collaborative efforts among policymakers, industry stakeholders, and local communities to ensure sustainable economic growth and resilience. By examining the economic impact of

Nebraska's cattle processing plants at both the local and state levels, this research contributes to a deeper understanding of the dynamics shaping rural economics and community well-being in Nebraska.

Poster U10– Bella Neuhaus

Mentor: Peter Longo

Title: *Normative Consideration for Environmental Policy: Photos and Fragile Values*

There is a gap between policymakers, the public, and the environment in which its policies affect. This gap leads to ineffective policy, as well as an intense lack of widespread environmental public awareness and engagement. This project will utilize photography, a powerful visual medium that has the potential to bridge this divide. Images have the ability to not only evoke emotions but also convey the urgency of environmental issues in a way that policy and laws often cannot. By using my photography to document the impactful way I perceive nature and the environment, as well as environmental degradation, pollution, and the consequences of unsustainable practices, I will be able to create a visual narrative that resonates with the public on a deeper level. These images serve as a catalyst for public awareness, advocacy, and, ultimately, policy change. My analysis through writing and photography can humanize environmental issues, making them more relatable and inspiring to those who interact with my work. My visual storytelling through photography is a vital tool in enhancing the impact and reach of environmental policy, fostering a sense of shared responsibility and collective action.

Poster U11– Brooke Thoendel

Mentor: Peter Longo

Title: *Immigration, a pathway to mitigate the rural labor shortage*

Lawmakers, impacted workers, and the business sector have persistently explored Immigration pathways to mitigate the rural labor shortage. There is abundant research that documents the current labor shortage, the immigrant working population, as well as efforts to mitigate labor shortages. The shortage of laborers (documented or not) remains a challenge for the business sector. This paper will: 1) analyze the policies aimed to address the rural labor shortage; 2) evaluate immigration policies that impact the labor force; 3) consider legislation and court cases that mitigate immigration and labor shortages; 4) propose a solution based on laws and sound business practices that will allow for immigration policies that are helpful to the immigrant as well as the business sector.

Poster U12– Juliana Merrihew

Mentor: Peter Longo

Title: *Ensuring Empowering Opportunities for K-12 Students in Rural Nebraska*

Rural schools face unique barriers and challenges from limited resources to outmigration to teacher shortages. The purpose of this project is to analyze these challenges and identify areas where opportunities for rural students can be expanded, leading to their empowerment. Specifically, the project focuses on the interconnectedness of rural schools with their communities. Rural towns are slowly fading due to outmigration and school consolidation. It is important to halt this trend lest a vital part of American culture and history be lost. This project analyses how an empowering and strong rural school will lead to a stronger and healthier rural community. Finally, this research discusses the implementation of place-based education as a strategy for empowering rural students and their communities. Place-based education focuses on connecting the student to the community to help them find meaning in their studies. This can occur through researching the history of the rural area, exploring local career opportunities, learning from community members, and much more. This research seeks to show that by engaging students in local problem solving, they can become empowered to be invested in their own lives and the lives of others. Analysis of place-based education ought to reveal possible educational benefits. This project will provide strategies for creating empowering opportunities that will uplift rural students and their communities.

Poster U13– Braden Peterworth

Mentor: Chuck Rowling

Co-Author: Caleb Hendrickson

Title: *The Battle for the Soul of America: How Joe Biden expanded American Exceptionalism*

This study discusses how Joe Biden expanded American exceptionalism and the modern jeremiad during the 2020 presidential election by utilizing a new theme in his speeches, a theme presenting the election as a ‘battle for the soul’ of the nation. Such a theme expands American exceptionalism and the modern jeremiad largely by invoking the “soul” of the United States during a presidential campaign. We argue that Biden utilized this new theme, following his return to the modern jeremiad under its disappearance in the Trump campaign, at an unprecedented rate compared to his predecessors. This study broke down American exceptionalism and the modern jeremiad into several codes with the purpose of illustrating patterns in our data. Our findings show that Biden: (1) utilized American exceptionalism and the modern jeremiad during his presidential campaign in 2020, which was a return to normal

following the Trump presidency; and (2) introduced a new concept into those two theories, a code we titled, the 'battle for the soul'. We discuss how this new language utilized by Biden helped return attention to American exceptionalism and helped gardener support for his campaign against Donald Trump in 2020. This study can be applied to future presidential elections and expand upon the concept of American exceptionalism and the modern jeremiad through analyzing the application of 'battle for the soul' by future presidential candidates to their campaign speeches.

Poster U14– Tanner Jonas

Mentor: Chuck Rowling

Title: *The Lessons from the Past and Guidance to the Future: The War Powers Act*

The Lessons from the Past and Guidance to the future: The War Powers Act. The War powers act held restraint on the president's ability to send overseas forces and requiring consultation with Congress before involving U.S. forces in foreign military operations. The President is assigned to be the commander in chief but there is little to no command without congressional approbation. Also understanding the various foreign policy methods and different decision-making models such as Rational Actor Model and Group think model and what impact that has on the War Powers Act. Looking at the constitution, it lays out the presidential powers and congressional authority. Understanding the different roles which the President has as well as the interaction with congress. The impacts of which the act has had been tested on by Congress either choosing not to enact it or approving wartime engagements. By looking at the Constitutionality of the act and searching through past and present court cases dealing with the war powers. Looking at various real-world cases, such as the war in Vietnam. Congress essentially pulled America out of that war by cutting funding to Vietnam, resulting in America pulling out. I also plan to look at more recent cases and real-world issues such as the wars in Ukraine, Yemen, and Israel. By comparing and contrasting the use of Presidential power will give a better insight what the decision making process looks like and how certain situations can be resolved.

Poster U15– Carson Kreager

Mentor: Satoshi Machida

Title: *American Image and News Consumption Among International Students*

This research project aims to investigate the perspectives of international students regarding the United States and its democratic principles, focusing on their news consumption habits. The study explores whether international students' choice of news medium, whether in their native language or in English, influences their perceptions of the United States and its democratic values. Drawing upon theories of media influence and cultural perceptions, this research employs a mixed-methods approach to gather

and analyze data. A quantitative survey will be distributed to international students across UNK to capture demographic information, patterns of news consumption, and overall attitudes towards American democracy. The findings of this study will shed light on the nuanced ways in which international students interpret news content and its implications for their understanding of the United States and its democratic system. By examining differences in perception based on language preference and news sources, this research seeks to contribute to a deeper understanding of the role of media in shaping international perspectives of democracy. The implications of this study can inform media literacy initiatives, cross-cultural communication strategies, and international education programs aimed at fostering mutual understanding and cooperation among global citizens.

Poster U16– Mallory Tobias

Mentor: Peter Longo

Title: *Nebraska's Inmate Overpopulation: Policies to Ensure Ethical and Practical Prisons*

This paper will examine the overcrowding of Nebraska's correctional facilities. The reasons for Nebraska's This project aims to discover the variables associated with the high incarceration rates in Nebraska and how the aggregate variables connect to the overpopulation in our prisons. In my research, important data about Nebraska's current prison system will be examined. Further, the study will discover the critical differences between Nebraska's prison system and other states. I will also investigate the possible courses of action that Nebraskan officials should take to mitigate the overpopulation in prisons and ensure ethical and practical policies for the incarcerated. Incorporating the solutions other states have taken and practical resolution, this study has created a possible action plan to compete with Nebraska's rising inmate population. This project was constructed using traditional social science and legal research.

Poster U17 Maddie Getz

Mentor: Peter Longo

Title: *Community Reinvestment Act: Political Overview and Policy Considerations*

The effects financial institutions have on opportunities, security, and access to resources for individuals are both vast in number and impact. The Community Reinvestment Act (CRA) of 1977 stands as a significant and pivotal piece of legislation born out of the economic and social challenges of the late 20th century. Emerging against a backdrop of urban decline, redlining, and the Civil Rights Movement of the 1960's call for equitable financial policies, the CRA came about as a response to systemic disparities in the financial sector. This paper will examine the historical and political developments of the CRA and evaluate the impact on urban development and

financial institution regulations. Examining the revisions and updates to the CRA will provide context for the analysis of the evolving landscape of community development and financial inclusion standards and goals. This paper will provide considerations for long term economic and financial development, and further offer pathways for future policy developments.

Poster U18– Kennia Garcia-Retana

Mentor: Diane Duffin

Title: *What Americans Know About Politics and Why It Matters*

Understanding American political engagement across age groups is crucial for grasping how perspectives historically have and will differ for future generations. It's essential to see how political leanings—right or wrong influence views on significant matters like political affiliation and global affairs. This knowledge is vital for a functioning democracy and effective policy-making. The importance of political awareness is key as it highlights the need for informed citizenship. To dive deeper into this, I'm conducting research by sending out a national survey to capture current data on political awareness, offering insights into how political engagement has and will continue to evolve. My research further builds on the foundational work of "What Americans Know About Politics and Why It Matters" by Michael X. Delli Carpini and Scott Keeter (1997), and explores how these concepts have evolved in relation to Millennials and Gen Z.

Poster U19– Kimberly Gomez

Mentor: Diane Duffin

Title: *Information as a Tool: Social Media Behavior and Ideological Identity*

With the rise of social media and the acceleration of accessibility to information, almost anything can be dispersed to large audiences in mere seconds. Having seen the harm of what misinformation and disinformation can do, a study asking how different ideologies respond to, and how they analyze information—real and fake—is necessary. This study aims to answer that question. In a survey format, respondents are presented articles that mirror those found on Facebook. Some of these articles are real, and some are fake. The study then asks a range of questions, all to seek out how different ideologies behave when exposed with this media at different levels of validity. Our democracy is dependent on public participation. At the same time, communication can be the root of the institution's weakening. This study can help find what it is we need to work on to ensure that information that is being disseminated is factual and helpful. Only then can we have a healthy democracy with helpful participation from all.

Poster U20– Sam Snider

Mentor: William Aviles

Title: *Right to work laws*

Right to work laws are legislation passed at the state level which ends required participation in a union if there is a majority vote for the formation of a union. This law is attributed with the decline of union rates in every state its passed in. The scholarly literature suggests that there are three precipitating factors attributed with the passage of right to work laws. The first factor being a republican majority in the state legislature, is required to get right to work laws enacted. The second factor is republican control of the governorship within the state. With the final factor being a wealthy donor backing the right to work legislation campaign financially. The combination of all three of these factors is suggested by the literature to almost always guarantee the passage of a right to work laws. However, the state of Montana has met all three of these conditions, and yet right to work has failed to pass two times within the state. I will be analyzing how these pro union campaigns were able to defeat the passage of right to work law campaigns twice. With the three precipitating factors that result in the passage of right to work laws being met, how did Montana end up not passing the legislation? I hypothesize that this was due to grass roots campaigning within local communities. With pro union activists building community relationships and working with or pressuring republican law makers to vote against the passage of right to work laws.

Poster U21 – Temo Molina

Mentor: Satoshi Machida

Title: *Perceived Legitimacy of Online Political Media: The Effect of an Appeal to Academic Institutions*

Internet platforms present many political news stories and rhetoric in various ideological persuasions. The proposed research focuses on how consumers decide what political media on the Internet is legitimate. An appeal to the authority of academic institutions is one way that media outlets may convince consumers of their legitimacy. Elements such as citing expertise or adopting an 'educational brand' can make political media appear more legitimate by offering a sense of credibility. Online media outlets, then, may seek to enhance the legitimacy of their ideas by incorporating an appeal to an academic institution, e.g., a university. The expected result would be that consumers are more likely to trust such online media. Online political media that appeals to the authority of academic institutions is expected to increase the likelihood of media consumers perceiving the media as legitimate. This project will test this hypothesis by conducting a survey experiment and analysis. The survey will present participants with political content that appeals to the authority of a university and content that does not, asking them to evaluate if the content is legitimate, controlling important variables such as ideology. The resulting research may contribute to a better

understanding of the strategies and effectiveness of political narratives in online media today.

Poster U22 – Alyssa King

Mentor: William Aviles

Title: *Policy Coalitions and Sex Trafficking: The Case of Nebraska*

Sex trafficking has long been a significant concern, but its visibility has seemed to rapidly increase, paralleling that of arms and drug trafficking. At the national level, research suggests that there is an alliance between conservative Christian organizations and secular feminist organizations in developing and passing sex trafficking legislation on a national level. In this study, I aim to understand whether the coalition politics associated with the passage of antitrafficking legislation on a national level has been relevant to similar legislation on the state level, using the case of Nebraska. I seek to determine the extent these coalitions shape sex trafficking policy in Nebraska, and if not, to analyze the nature of the policy coalitions who have successfully passed anti-trafficking legislation in the state.

Poster U23 – Caitlynn Wahls

Mentor: William Aviles

Title: *Drug Policy and Psychedelic Mushrooms*

In the mid-20th century, the US experienced a shift in drug policy, particularly concerning psychedelics, led by figures like Timothy Leary and the counter-culture movement of the 1960s. Timothy Leary, a Harvard psychologist, became an advocate for the use of psychedelics such as LSD, believing they held therapeutic potential for personal growth and spiritual exploration. However, the government's response was influenced by tension in social and political contexts, including President Nixon and the Vietnam War. The 1960s were a time of social upheaval, with widespread opposition to the Vietnam War and a growing distrust in the government. The counter-culture movement, characterized by a rejection of mainstream values to embrace alternative lifestyles, used psychedelics as a means of challenging societal norms and seeking personal enlightenment. The government responded with increasingly stringent drug policies, viewing psychedelics as dangerous substances that threatened social order. The Controlled Substances Act of 1970 classified psychedelics as Schedule I drugs. This criminalized the possession and use outside of approved medical research settings and marked a significant turning point in drug policy. There has been a resurgence of interest in psychedelics for their therapeutic potential, particularly in the treatment of mental health disorders such as depression, anxiety, and PTSD. Clinical research has demonstrated promising results, leading to a reconsideration of drug

policy. Several cities and states have decriminalized psychedelics, and support is growing for expanding access to psychedelic-assisted therapy. The recent change in drug policy reflects a broader recognition of the limitations of prohibitionist approaches and a growing acknowledgment of the therapeutic benefits of psychedelics within the mental health community. While challenges remain, including regulatory hurdles and stigma, the evolving landscape of drug policy offers alternative treatments for mental health disorders and highlights the importance of evidence-based approaches in shaping drug policy.

Poster U24 - Arielle Lawrence

Mentor: William Aviles

Title: *Continuity of the Prohibitionist Paradigm; The Case of the Drug War in Nebraska*

The War on Drugs within the United States alone caused an uproar of differences in opinions, actions, and government policies that were passed to “save the children.” However, within Nebraska, it seems that these policies were taken through the 1980s into the present-day issues that the general public is experiencing in 2024. From President Richard Nixon announcing the War on Drugs to the United States public to Governor Jim Pillen and Former Governor Pete Ricketts implementing the same ideas as President Nixon did. The growing issue of not only legalizing cannabis within Nebraska but attaining a place on the ballot is a constant struggle that is at the forefront of multiple debates. Nebraska, among its neighboring states such as Colorado, stands out as “a sore thumb” due to the lack of prevalent opinions and current policies that correlate with what is occurring today. Consequently, what is the driving factor that keeps Nebraska stuck in the History books when it comes to contemporary issues such as cannabis? Many issues could be a possibility I will examine throughout my research including the following: the Ricketts administration, norm entrepreneurs shaping our ideologies, the ever-present generational politics gap, and regional opinions on the War on Drugs originating from the Nixon administration. Will Nebraska ever be able to close the chapter within the historic period that is holding them back from this ongoing divide?

Psychology

Poster U25 - Juana Perez

Mentor: Katherine Moen

Title: *Mind Matters: The Interplay of Bilingualism and Anxiety on Academic Assessment*

The goal of the current study was to determine if the high working memory capacity, associated with bilingualism, is impacted by anxiety, in that bilingual individuals with high anxiety may perform better on cognitive tasks compared to monolingual individuals. Additionally, we examined whether the relationship between working memory capacity and anxiety exists for typical academic assessments, like exams over lecture content. We used a 2x2 between subjects design with language ability (bilingual, monolingual) and trait anxiety (low, high) as our independent variables. Test accuracy was the dependent variable. Participants watched a short lecture video and then answered questions about their perceived level of knowledge/confidence as well as rated how many questions they think they could answer correctly. After these ratings, participants completed a true/false test. We also assessed their trait anxiety and language background. We hypothesized a main effect of bilingualism in that bilingual participants will have higher accuracy on the memory test than monolingual students. We did not hypothesize a main effect of anxiety, because the effect of anxiety depends on language ability (working memory capacity). We hypothesized an interaction in that when anxiety is low, there will be no differences between monolingual and bilingual participations. However, when anxiety is high, bilingual participants will have increased accuracy compared to monolingual participants. Overall, this study will help us better understand the relationship between anxiety and working memory capacity, and extend previous research to examine the role of language ability in combination with these factors.

Poster U26 - Lacey Broadwell

Mentor: Julie Lanz

Title: *Development of a Stressor Voice Measure for Nurses*

The purpose of our study was to develop a stressor voice behavior scale to identify how frequently nurses communicate about stressful workplace events. The authors define stressor voice as change-oriented communication about workplace factors that elicit a stress response, and the behaviors that facilitate this. Stress in the nursing field has contributed to high rates of burnout, reduced patient and nurse safety, and high turnover rates (Weston, 2022). Morrison (2024) has found that all these factors are reduced by "employee voice", defined as upwards communication with the intent to

make change. Across three phases, we held interviews, piloted items, and factor analyzed the scale. Phase I collected qualitative input from 21 full-time nurses who expressed their experience of stress in the nursing field and attitudes about speaking up about them. Structural and focused coding resulted in 142 statements. These were revised into a 13-item measure for stressor voice behaviors (SVBs). Phase II was a pre pilot for our measure on 15 nurses. Items were rated on relevance and clarity, and those with a score <2.93 were removed or revised, resulting in an 11-item measure. Phase III piloted the measure on 244 nurses. An exploratory factor analysis narrowed the measure down to 9 items. An example item is “I speak up about stressors that I experience at work.” Future research includes conducting a construct validation study to further examine how stressor voice barriers and behaviors relate to common safety and health-related outcomes. Stressor voice may be related to safety voice, psychological safety, safety climate, near misses, safety workarounds, burnout, safety performance, knowledge, and motivation, turnover intentions, and cognitive failures. This could lower turnover, burnout, and injuries/fatalities (Weston, 2022).

Poster U27 - Johanna McClure

Mentor: Katherine Moen

Co-Author: Katherine Moen

Title: *Hes guilty! The role of weapon type and juror instructions on perceptions of reasonable use of force*

Our goal was to examine if the weapon type and education provided to a mock jury impacted decisions and perceptions in a criminal trial. We utilized a 2 (weapon: firearm vs. taser) x 2 (education: informational video vs. written instructions) between-subjects design. We hypothesized a main effect of weapon type, in that the use of force will be judged as more reasonable when a taser is used compared to a firearm. We hypothesized a main effect of education, in that the use of force will be judged as more reasonable following an informational video compared to written juror instructions. Finally, we predicted an interaction between weapon type and education, in that the use of force will be considered equally as reasonable, regardless of weapon type, when participants have an informational video, but for the written juror instructions, the use of force will be considered less reasonable for the firearm condition compared to the taser condition. Results from 100 participants revealed a main effect of weapon type on severity, reasonableness, and accountability of the officer's actions towards the suspect. However, there was no main effect of education type and no interaction between weapon type and education type. To examine how individual differences may have impacted our results, we also conducted a regression analysis, and found that weapon type and political affiliation significantly predicted how severe the officers' actions were rated. Overall, these results suggest that one educational video is not sufficient to educate the lay public on appropriate use of force. Further research is

needed to determine how education programs may impact reasonableness judgements.

Poster U28 - Peyton Neff

Mentor: Megan Strain

Title: *The Role of Gender in Humor Enjoyment*

The stereotype that women aren't funny has been a common perception in our society and has had lasting effects on our perceptions of gender dynamics in general, and in the context of humor. Research regarding this stereotype suggests that most people find men to be the funnier sex and only a small percentage of people think women are funnier than men (e.g., Hooper et al., 2016).

Additionally, there is evidence to suggest that there are complex gender norms when it comes to the group a joke is targeting (Strain et al., 2015), and whether the joke subverts or reinforces stereotypes (e.g., Strain et al., 2016). Specifically, men and women rate anti-men and anti-women humor differently and have differing perceptions of the individuals sharing the humor: making jokes about one's own group is seen as acceptable, while making jokes about an outgroup is varied, based on social hierarchy position. Women who "punch up" by making jokes about men are perceived more positively than men who "punch down" by making jokes about women (Strain et al., 2015). Previously, we found ([Authors Redacted], 2023) that jokes told by female comedians were rated more positively than jokes told by male comedians. Additionally, jokes targeting men were rated more positively than jokes targeting women. However, our sample was mostly women, preventing us from examining participant gender as a moderator. The goal of the current study was to obtain a balanced sample of men and women to examine the interaction among comedian sex, joke target gender, and participant gender on participants' perception of comedy clips.

We proposed competing hypotheses. If the "punching down" hypothesis were supported, then consistent with past stereotypes and gender norms, male comedians would be rated more positively than female comedians, and jokes targeting women would be perceived as funnier than those targeting men. Conversely, the "punching up" hypothesis would support previous work and more modern perceptions of gender-based humor, resulting in an opposite pattern. Female comedians would be rated similarly to or more positively than male comedians, and jokes targeting men would be perceived similarly to or more positively than jokes about women (especially when those jokes were made by women). Lastly, we expected that participant gender would moderate these effects; the outcomes above likely depend on whether the viewer is a man or woman.

We recruited 60 participants (30 men, 30 women) from Prolific, who completed a 20-minute Qualtrics study for compensation. We used a 2 (comedian sex: male, female) x 2 (joke target: men, women) x 2 (participant gender: men, women) mixed factorial design. Each condition contained 3 different comedians joking about either men or women, in a roughly one-minute clip (piloted for similarity in funniness). After viewing each clip, participants rated their funniness, enjoyment, offensiveness, and relatability, using response scales from 1 (Not at All) to 7 (Very Much). Responses were then averaged for each condition to create a composite rating for each variable in each condition.

We conducted a mixed factorial MANOVA to test our hypotheses, and found a significant main effect for comedian sex (Pillai's Trace = .372, $F(4, 55) = 8.15$, $p = .036$, $\eta p^2 = .160$) and participant gender (Pillai's Trace = .168, $F(4, 55) = 2.78$, $p < .001$, $\eta p^2 = .372$). Significant interactions also emerged between participant gender and joke target (Pillai's Trace = .168, $F(4, 55) = 2.61$, $p = .045$, $\eta p^2 = .160$) and comedian sex and joke target (Pillai's Trace = .247, $F(4, 55) = 4.52$, $p = .003$, $\eta p^2 = .247$).

Univariate analyses showed a significant main effect of comedian sex on enjoyment $F(1, 58) = 6.047$, $p = 0.017$, $\eta p^2 = 0.094$, such that female comedians ($M = 4.44$, $SD = 1.63$) were rated as more enjoyable than male comedians ($M = 4.11$, $SD = 1.70$). Comedian sex and target gender also interacted ($F(1,58) = 9.750$, $p = 0.003$, $\eta p^2 = 0.144$); female comedians targeting men were most enjoyed ($M = 4.67$, $SD = 1.61$) relative to other conditions. This interaction was also present for funniness ($F(1,58) = 9.947$, $p = 0.003$, $\eta p^2 = 0.146$); female comedians targeting men were the funniest of the four conditions ($M = 4.71$, $SD = 1.64$). Together, these results support the “punching up” hypothesis that perceptions of female comedians and who it is acceptable to joke about, are shifting.

We also found a significant main effect of comedian sex on offensiveness ($F(1,58) = 31.774$, $p < 0.001$, $\eta p^2 = 0.354$); male comedians ($M = 2.18$, $SD = 1.31$) were more offensive than female comedians ($M = 1.58$, $SD = 0.81$). A significant interaction also emerged between comedian sex and participant gender ($F(1,58) = 5.142$, $p = 0.027$, $\eta p^2 = 0.081$). Among women in our sample, male comedians were perceived as more offensive ($M = 2.50$, $SD = 1.48$) than female comedians ($M = 1.65$, $SD = 0.74$).

Additionally, there was a lack of significant univariate effects for target gender on any of the DV's, and no significant interactions between comedian and participant gender, or between target and participant gender. There was also no 3-way interaction for any of the dependent measures, suggesting that perceptions of male and female comedians when joking about men or women did not depend on the viewer's gender. (Interestingly, these findings occurred despite the fact that male comedians joking

about women received the highest relatability ratings ($M = 3.94$, $SD = 1.58$) compared to the rest of the conditions, $F(1,58) = 11.559$, $p = 0.001$, $\eta p^2 = 0.166$).

Together, these findings suggest that “punching up” is the new normal; cultural shifts in perceptions of female comedians, and what is enjoyable joke content have led to audiences showing more appreciation for female funniness. Our data suggest that male and female comedians may now be perceived similarly, and in fact, our sample found females joking about men the most enjoyable of all our conditions. This may suggest that audiences are starting to recognize value in humor targeting those at the top of the social hierarchy, rather than those at lower levels.

Poster U29 - Ibinye Green

Mentor: Megan Strain

Co-Author: Megan Strain

Title: *Hesitant Recognition: Factors affecting reactions to racism in the healthcare setting*

Racism is an often overlooked and underestimated problem in healthcare. It has been linked to worse quality of care and lower trust in doctors (Findling et al., 2022), which reduces treatment-seeking in patients of color. Broadly, racism may manifest overtly (e.g., discrimination) or subtly (e.g., disrespect; Rhee et al., 2018). In healthcare settings this may create life-or-death consequences. And while such behaviors may be apparent to some, it may also go unnoticed by others, making it an important area of study. Recognizing an incident as racist is the first step that must be taken to address it (i.e., the five steps of helping; Latané, & Darley, 1970). Examining factors affecting individuals' likelihood of recognizing racism in a healthcare setting may help reduce racial healthcare disparities.

Firsthand experience with racism may prompt Black doctors to actively combat its emergence in interactions with their patients, but this may also be undermined by systemic racism (Harvard Health, 2017). Doctors of color may unintentionally engage in racism-perpetuating behavior, which could be less likely to be recognized since they themselves are members of a marginalized group. The goal of the current study was to examine whether these factors may impact individuals' likelihood of recognizing and therefore reporting incidents of racism in a healthcare setting.

Participants ($N = 160$, 70.2% White) were recruited via Prolific and completed the study online. They were presented with one of four vignettes describing a doctor-patient interaction in a 2 (racism: subtle vs. overt) x 2 (doctor race: white vs. black) between-groups design. Participants were asked to imagine that they worked in Human Resources, evaluating incident reports and deciding whether to escalate them. They then read a scenario in which a White or Black doctor made either a subtly or overtly

discriminatory comment to his Black patient. Afterward, they rated their perceptions of the doctor's appropriateness, professionalism, degree of discrimination shown, and how likely they would be to escalate the incident using scales from 1 (not at all) to 7 (very much/likely).

We conducted a MANOVA using the variables specified above to test for differences in the set of DVs together. Significant multivariate effects emerged for racism severity (Pillai's Trace = .262, $F(4, 152) = 13.52$, $p < .001$, $\eta p^2 = .26$) and doctor race (Pillai's Trace = .106, $F(4, 152) = 4.49$, $p = .002$, $\eta p^2 = .11$). A marginally significant multivariate interaction was found, suggesting that the effect of racism severity on the dependent measures may depend on the doctor's race ($F(4, 152) = 2.42$, $p = .051$, $\eta p^2 = .06$). However, no significant interactions emerged at the univariate level ($.07 < ps < .75$), so the results below describe only main effects.

Effects of Racism Severity

Contrary to hypotheses, univariate analyses revealed no significant effect of racism severity on professionalism ($F(1, 155) = 3.16$, $p = .078$, $\eta p^2 = 0.020$) or appropriateness ($F(1, 155) = 1.06$, $p = 0.305$, $\eta p^2 = 0.007$), suggesting that regardless of severity, participants perceived the incident as unprofessional and inappropriate. However, there was a significant, large effect of racism severity on perceived discrimination as expected ($F(1, 155) = 51.24$, $p < 0.001$, $\eta p^2 = 0.248$), such that individuals who reviewed the subtle incident ($M = 5.20$, $SD = 1.55$) perceived less discrimination than those who reviewed the overt incident ($M = 6.53$, $SD = 1.06$). Similarly, there was a significant effect of racism severity on likelihood to escalate ($F(1, 155) = 6.14$, $p = 0.014$, $\eta p^2 = 0.038$); individuals who reviewed the subtle incident ($M = 6.31$, $SD = 1.16$) reported being somewhat less likely to escalate the situation than those who reviewed the overt incident ($M = 6.70$, $SD = 0.85$).

Effects of Doctor Race

Additionally, as a result of floor effects, there was no significant effect of doctor race on professionalism ($F(1, 155) = 0.01$, $p = 0.919$, $\eta p^2 = 0.000$), appropriateness ($F(1, 155) = 0.29$, $p = 0.592$, $\eta p^2 = 0.002$), or likelihood to escalate ($F(1, 155) = 1.30$, $p = 0.26$, $\eta p^2 = 0.008$) which suggests that contrary to hypotheses, the behavior was recognized as unprofessional, inappropriate, and in need of escalation regardless of the doctor's race. However, doctor race did have a significant effect on whether the behavior was perceived as discriminatory ($F(1, 155) = 15.13$, $p < 0.001$, $\eta p^2 = 0.089$); individuals who read about a Black doctor were less likely to label the incident as discrimination ($M = 5.49$, $SD = 1.64$) than those who read about a White doctor ($M = 6.23$, $SD = 1.20$).

Discussion

Although some of our hypotheses were only partially supported, we are optimistic about the results of this study. We were pleasantly surprised to discover floor effects in our (mostly White) participants' perceptions of the behavior as unprofessional and inappropriate, regardless of whether the racism described was subtle or overt, and regardless of whether the doctor was Black or White. However, we did see differences in participants' willingness to label the incident as discrimination, and to escalate/report it. When the racism was subtle or the doctor was Black, they seemed to be less sure of these actions. Thus, in cases where racism and discrimination are more ambiguous to onlookers (who may be less affected by it), it may be more difficult for them to decide how to proceed in helping (i.e., Latane & Darley, 1970). Future research should examine this further by studying the justifications that may prevent participants from intervening.

Poster U30 - Ianna Fill

Mentor: Dawn Mollenkopf

Title: *Exploring Cognitive Dissonance: Unraveling Influences and Extending Understanding*

Cognitive dissonance (CD) is a sociological theory introduced by Festinger in 1957, which proposes that individuals experience discomfort when holding conflicting beliefs or attitudes. To resolve this dissonance, people may adjust their beliefs, seek new information, or change their behaviors to align with their cognitions, ultimately aiming to restore internal balance (Harmon & Mills, 2019). This research investigates cognitive dissonance (CD) in a diverse population by examining the topics causing CD, how individuals resolve it, and identifying those most affected. Many of the studies conducted on this topic focus on college students, who are largely white and male. The study expands CD research by focusing on a more diverse population to enhance our understanding. The methodology involves conducting three focus groups for qualitative insights that will inform understanding of CD and also lay the foundation for the development of a survey for further study. This approach allows for a comprehensive exploration of cognitive dissonance and its resolution strategies. The study employs a two-phase approach. Initially, focus groups will be conducted to qualitatively explore the topics causing cognitive dissonance and the strategies individuals employ for resolution. Afterward, a survey will be created from the data gleaned from the focus groups. This mixed-methods approach ensures a nuanced understanding of cognitive dissonance across diverse populations.

Poster U31 - Reagan Klein

Mentor: Emily Bartholomay

Title: *The Influence of Mental Health and Coping on Weight Change in College Students*

College student mental health is a growing area of concern, with students reporting high levels of mental health symptoms, and college counseling centers having increased utilization of services (Beiter et al., 2006). College students have higher rates of anxiety and depression compared to community samples (Bartholomay et al., 2021), and the rates of anxiety, depression, and suicidal thoughts and behaviors have significantly increased in the last 15 years (Duffy et. al, 2019). Since the COVID-19 pandemic, more students are struggling with their mental health (Nails et. al, 2023). While increased stress during the college years may be somewhat inevitable, effective coping with that stress is essential in preventing longer-term problems. Coping, which is defined as how people respond to instances of adversity, is essential for effective recovery from stressful events (Kim et al., 2022; Mazur-Socha et al., 2023). In addition to mental health concerns, students may also struggle with physical health during their college years. Many college students will experience some type of weight change, and students often report experiencing high levels of anxiety, depression, and stress (Amir-Hamzah et. al, 2019; Lloyd-Richardson et al., 2009).

We plan to recruit 30 undergraduate students from a mid-sized University in the Midwest to participate in our study. Participants will complete two data collection sessions, one week apart. At time one, they will be weighed and answer a series of surveys to measure stress, anxiety, depression, and coping. Participants will return one week later to be weighed a second time. We anticipate to see a relationship between rates of anxiety, depression, stress, coping and weight change within the participant sample.

Natural & Physical Sciences

Biology

Poster U32 – Bryce Sutton

Mentor: Brian Peterson

Title: *Use of Non-traditional Cast Antler Metrics to Evaluate Fluctuating Asymmetry in Nebraska White-tailed Deer*

Antlers, perennial paired appendages, are cast annually by Cervid species and are genetically coded to have perfect bilateral symmetry. However environmental stressors cause major to minor asymmetries between antler sides. White-tailed deer (*Odocoileus virginianus*), cast antlers provide an underutilized set of metrics that are not available prior to naturally shedding. Fluctuating asymmetry is an index of developmental instability and can be measured as small deviations from perfect bilateral symmetry. Typically, older more prime males within a deer population can buffer and are less susceptible to stressors resulting in more symmetric antlers. Previous studies have quantified relative fluctuating asymmetry (RFA) to identify the most symmetric, best age-specific pre- and post-cast antler metrics to confirm an antler pair. The first initiated, oldest antler growth (basal circumference and main beam length) were identified to be the most symmetric measurement, while older deer were more symmetric than younger deer. My project's objective was to develop new non-traditional antler metric protocols to better evaluate fluctuating asymmetry between antler sides and age groups. These new protocols included point of tine branching, non-broken matching tine lengths, and antler tine angles. We hypothesized that 1) non-traditional metrics would have lower RFA values than traditional methods, and 2) older deer would have more symmetric antler sides than younger deer. Preliminary results found a decrease in RFA values for all comparable measurements reported in previous studies using traditional methods. We will continue to implement our new methods and compare RFA values between age groups as we increase our sample size. We are optimistic that these non-traditional protocols can be used to better evaluate and quantify phenotypic antler growth between antler sides in white-tailed deer.

Poster U33 – Belle Turk

Mentor: Kim Carlson

Co-Authors: Amanda Macke, Darby Carlson, Alexis Hobbs

Title: *Characterization of the Nuclear Localization Signal (NLS) of ORF1 of Nora virus*

Nora virus is a picorna-like virus that is endemic in *Drosophila melanogaster* and referred to as *D. melanogaster* Nora virus (DmNV). The genome of DmNV contains four open reading frames (ORFs) known as ORF1, ORF2, ORF3, and ORF4. ORF1, the focus in this study, has a role in RNA interference, RNAi, suppression through inhibition of the RNA induced silencing complex, RISC. This allows Nora virus to remain persistent in its host. Sequence analysis of ORF1 shows not one, but four potential putative bipartite nuclear localization signal (NLS) sites. The NLS 2 and 3 sites overlap and are considered together as one NLS or NLS 2. Knockout mutations for NLS 1, 2, 3, 1 & 2, 1 & 3, 2 & 3, and all three knockout mutations together (1, 2, & 3), were created and cloned into the pCR-TOPO vector. The mutants will be subjected to sequencing to verify that the intended mutations were created. The verified mutants will be subcloned into pEGFP, transfected into S2 cells, the nucleus stained with DAPI, and visualized using confocal microscopy. This study will let us determine the identity of the ORF1 NLS responsible for translocation of DmNV to the nucleus. The project described was supported by an Institutional Development Award (IDeA) from the National Institute of General Medical Sciences of the National Institutes of Health under Grant #5P20GM103427.

Poster U34 – Sunayn Cheku

Mentor: Kim Carlson

Co-Authors: Blase Rokusek, Sunanda Rajput, Kim Carlson

Title: *Investigating the Role for Diacylglycerol in Heat Tolerance in *Drosophila melanogaster**

Since the discovery of the heat shock response, there is an interest in studying heat tolerance in *Drosophila melanogaster*. Thermal tolerance in *Drosophila* and other insects has become increasingly relevant given the expected increase in global temperatures due to climate change. The investigation of diacylglycerol (DAG) in heat tolerance is one of significant interest considering previous lipidomic studies within the context of thermal regulation. Evidence from a study by Ko and colleagues (2019) showed that lines selected for elevated temperature knockdown resistance had a statistically significant increase in different DAG levels. This exploratory project hypothesized flies and S2 cells administered DAG would show increased heat tolerance. Two different species of DAG, Distearoyl glycerol (DAG) and Stearoyl arachidonoyl glycerol (SAG) were used. The experiments were conducted both in vivo and in vitro on adult *D. melanogaster* and S2 cells. Experimental groups included sex

(female or male); temperature (39°C and 40.5°C), exposure time (6h, 12h, 24h, and 3/4d). Flies receiving either a DSG/PEG solid dispersion oral suspension compared to a PEG control demonstrated a trend for better heat tolerance in males at 40.5°C and in females at 39.5°C both at 24h post treatment, although not statistically significant ($p > 0.06-0.1$). Secondly, S2 cells were treated with 1mM DSG and SAG for 12 h and heat shocked at 39°C for 45 mins. Preliminary data suggests that cells treated with both the compounds show a significantly higher survival rate than untreated cells ($p < 0.05$) The significance of this exploratory study was the multiple parameters tested. If conclusive results are obtained, future research investigating the molecular mechanisms of DAG induced heat tolerance in *Drosophila* will be conducted.

Poster U35 – Natalie Andreasen

Mentor: Kim Carlson

Co-Authors: Sunayn Cheku, Alexis Hobbs, Kim Carlson

Title: *Differential Effects of Drosophila melanogaster Nora virus Infection on Longevity and Viral Load in Relationship to Sex and Mating Status*

Drosophila melanogaster Nora virus (DmNV) is a single-stranded picorna-like RNA virus similar to that of poliovirus. DmNV replicates within the gut and is fecal-orally transmitted. As with other RNA viruses, DmNV load follows a biphasic pattern in aging virgin females. While a research has been performed mainly using virgin female *D. melanogaster*, little is known about the differential effects of DmNV in relationship to either sex (male versus female) and whether mating status (mated versus virgin). Virgin and mated male and female *D. melanogaster* will be reared both infected with DmNV and as uninfected controls. All treatment groups will run in triplicate in pint cages at 25°C with a diurnal light cycle. Every three days, the dead *D. melanogaster* will be collected and stored at -80°C. When the last *D. melanogaster* has died, the RNA from all the stored samples will be subjected to qRT-PCR to determine DmNV load. In addition, Kaplan-Meier survival curves will be constructed to determine if there are differences in longevity between the groups. Through the findings of this study, information will be provided on whether sex and mating status are impacted by DmNV infection affects these life history traits.

Poster U36 – Ella Buhlke

Mentor: Kim Carlson

Co-Authors: Blase Rokusek, Darby Carlson, Alexis Hobbs, Carlos Hernandez, Sunayn Cheku, Kim Carlson

Title: *One Hot Paradox: HSP90 Inhibition Reduces Nora Virus Load in Infected Adult Drosophila melanogaster, but the Heat Shock Response is Antiviral*

The heat shock response (HSR) was discovered and has been extensively studied in *Drosophila melanogaster*. Per se, this organism should serve as a good model in which to study the interaction of viral infection and the HSR. Yet, very little research involving this interaction has been conducted in *D. melanogaster*. The purpose of the present investigation was to validate the antiviral effect of pharmacological inhibition of HSP90 in vivo in a *D. melanogaster* model, which to our knowledge has never before been shown. Further, we sought to explore other aspects of the relationship between the HSR, heat shock factor (HSF), and viral infection. Specifically, we found that pharmacological HSP90 inhibition with 17-allylamino geldanamycin (17-AAG) significantly reduced estimates of viral load at 24 hours after *D. melanogaster* Nora virus (DmNV) infection ($P = 0.048$). Further, we found that at 24 hours after DmNV infection, treatment with Direct Targeted HSF-1 Inhibitor (DTHIB) significantly interacted ($P = 0.035$) with heat shock treatment at 36.5°C for one hour, such that DTHIB apparently blocked the protective effect of heat shock. We also report a trend whereby a line of *D. melanogaster* carrying a mutant HSF tended to have higher estimates of viral load relative to genetic controls with wild type HSF. Finally, we found that DmNV infection leads to significant elevation of HSP83 (HSP90; $P = 0.029$) and DNAJ-1 (HSP40; $P = 0.001$), 24 hours after infection. Our data suggest a prominent role for the HSR and associated inducible HSPs during DmNV infection in vivo.

Poster U37 – Kael Kingery

Mentor: Austin Nuxoll

Co-Authors: Kyle Dittmer, Tobias Kraft, Hector Palencia

Title: *Utilization of N-heterocyclic carbene silver-peptide complexes against Staphylococcus aureus*

Staphylococcus aureus is responsible for a wide range of infections, ranging from minor skin infections to invasive infections, many of which are recurrent. Antibiotic resistance is becoming increasingly common in most pathogenic bacteria, including *S. aureus*, rendering many antibiotic treatments ineffective. In addition to the threat of antimicrobial resistance, antibiotic tolerance within biofilms poses significant challenges to antimicrobial therapy. Biofilms are associated with upwards of 80% of all microbial infections and are particularly recalcitrant to antibiotic therapy due to decreased metabolic activity. There is an urgent need to develop new compounds to

fight this threat. Investigation of metal-N-heterocyclic complexes (NHCs) as antimicrobial agents has increased recently. NHCs have been found to be effective against a number of pathogenic bacteria including *Escherichia coli*, *Pseudomonas aeruginosa*, *Enterococcus faecalis*, and *Staphylococcus aureus*. However, whether these compounds are effective against biofilms remains largely unstudied. To further investigate this, we hypothesized these compounds would be effective in killing *Staphylococcus aureus* within biofilms. Ten compounds showed bactericidal activity against *S. aureus* with MICs ranging from 2-16 μ g/mL and MBCs ranging from 4-32 μ g/mL. Eight of the 14 compounds were effective in eradicating *S. aureus* growing in planktonic cultures. The compounds were then examined for their effectiveness against *S. aureus* biofilms. Our findings indicated that at least four compounds were effective in reducing bacterial burden within a biofilm. Currently, the silver-NHCs are being investigated biofilm dispersal abilities. Based on These results, we believe these compounds will be effective anti-microbial agents in the future.

Poster U38 – Kenan Brodd

Mentor: Austin Nuxoll

Co-Authors: Emma Weis, Alexis Hobbs, Kim Carlson, Austin Nuxoll

Title: *Staphylococcus aureus* Persister Cells Exhibit Higher Tolerance to Innate Immune Components

Staphylococcus aureus is a pathogenic bacterium capable of causing serious infection in humans, like skin lesions, endocarditis, and sepsis. Difficulty treating infections may be due to the presence of persister cells. Persister cells are defined by surviving antibiotic treatment, however, it is unclear whether they have a fitness advantage to other stressors. Specifically, survival to innate immunity remains largely unexplored. Previous experiments show that a *fumC* (fumarase C, a tricarboxylic acid cycle gene) knockout exhibits increased survival to antimicrobial peptides. These experiments prompted further investigation of persister survival to other components of innate immunity such as reactive oxygen (ROS) and nitrogen (RNS) species. *S. aureus* strains of wild type HG003 and *fumC*::N Σ were grown to mid-exponential phase, challenged with paraquat (induces ROS) and NaNO₂ (induces RNS), and survival was measured over 72 hours. Based on the finding that the *fumC*::N Σ strain had increased survival in the presence of ROS and RNS, survival within a macrophage was examined. RAW264.7 macrophages were infected with HG003 and *fumC*::N Σ and bacterial survival was measured over 48 hours. The *fumC*::N Σ strain exhibited increased survival suggesting persisters may provide a survival advantage to components of innate immunity in addition to antibiotics.

Poster U39 – Oliver Dunbar

Mentor: Melissa Wuellner

Co-Authors: Logan Zebro, Melissa Wuellner, Keith Koupal

Title: *Alewife Population Structure and Dynamics in Lake McConaughy, Nebraska*

Estimates of age and growth are important parameters for understanding fish population dynamics. Most studies of age and growth involve recreationally important species, but evaluations of population structure and dynamics are important to managing prey or introduced species. Alewife *Alosa pseudoharengus* are a prey species native to the Atlantic Coast and were introduced into Lake McConaughy, Nebraska in 1986. Today, Alewife are one of the most abundant species in the reservoir, and the population is self-sustaining. Evidence suggests that Alewife contribute to the food habits of many predators and have led to improvements in size structure and body condition of recreationally important species in the system. However, their introduction may have coincided with negative impacts to the zooplankton community. In 2023, Lake McConaughy was completely iced over for the longest period in recent memory, and winterkill may have altered population structure from the year prior. To date, no studies have examined population structure and dynamics of Alewife in Lake McConaughy. Therefore, the objective of this study was to evaluate the age and size structure and growth of Alewife in this reservoir. Alewife were collected in July 2022 and June 2023 using short-term (1 hour) small-mesh gill net sets, and all fish were collected near Kingsley Dam. Fish were measured for total length (TL; mm) and weighed (g). Sagittal otoliths were extracted and sectioned using a low-speed IsoMet saw and aged by two independent readers. Mean length at age and body condition were calculated, and length- and age-frequency histograms and length-weight regressions were developed. This information can be used to inform fisheries management decisions for Alewife in this system and in other inland waters where they have been introduced.

Poster U40– Marissa Hoover

Mentor: Joseph Dolence

Co-Authors: Joseph Roeder, Zane Carlson

Title: *Development of Vaping Peanut Allergy Mouse Models*

While vaping has become popular in recent years, the health effects of vaping remain unclear, especially how it impacts the immune responses that originate in the lung. We have shown that peanut (PN) allergy can be induced via inhalation in mice and recent data suggests this likely happens in humans. In this study, we developed mouse models to ask whether vaping can influence the ability of the immune system to mount allergic responses against PN. First, we showed that mice sensitized using PN solution containing vape juice displayed decreased PN-specific IgE responses and milder

anaphylaxis. To further study, we sensitized mice using electronic conditioned media (ECM) to expose mice to the vapor. To make ECM, we bubble vapor into the media used to expose the mice to PN and ask whether the vapor itself alters allergic responses. Preliminary data suggested mice exposed to 3 mg/mL nicotine ECM displayed lower PN-specific IgE. Currently, we are using 6 mg/mL nicotine ECM to examine whether this drives greater suppression. We next plan to examine whether ECM influences the ability of B and T cells to respond to PN using flow cytometry. Taken together, this data suggests that vaping stifles the ability of the immune system to mount immune responses to the clinically relevant PN antigen.

Poster U41 – Joe Paysen

Mentor: Keith Geluso

Co-Authors: Mackenzie Smith, Keith Geluso

Title: *Roost Sites of Eastern Red Bats and Evening Bats in the Great Plains*

Eastern Red Bats (*Lasiurus borealis*) are a migratory foliage roosting species and Evening Bats (*Nycticeius humeralis*) are a migratory cavity roosting species. Deciduous and evergreen trees commonly are used for roost sites in southern and eastern U.S. by both species. Little information is known about roost sites at the westernmost parts of their distribution in the Great Plains, where both bat species generally reside in narrow wooded riparian corridors within grasslands/agricultural fields. We radio-tracked a few individuals this past summer. A single Eastern Red Bat roosted in a Green Ash (*Fraxinus pennsylvanicus*) with young for multiple days, whereas two Evening Bats roosted six very large Plains Cottonwoods (*Populus deltoides*). Roost switching was common for Evening Bats, with roost exit counts of up to 138 individuals in a single tree cavity. Roost trees had larger DBH and greater tree heights for both bat species compared to randomly selected trees and surrounding trees in plots. Knowing roost site characteristics will benefit management practices and improve conservation efforts if these species face declines, as migratory bats are vulnerable to fatalities at wind-energy facilities.

Poster U42 – Emma Dowhower

Mentor: Bryan Drew

Title: *Phylogenetics of Kudrajaschevia (Lamiaceae)*

Nepeta, in the Lamiaceae or mint family, is a well-known genus of flowering plants. *Nepeta* contains catnip, catmint, and a variety of other economically important species. The taxonomy of the genus is complex, however. *Nepeta* is in the subtribe Nepetinae (Lamiaceae), a widely distributed group within the tribe Mentheae. *Nepeta* is the most recognizable and species rich genus within Nepetinae, with about 260 species. *Nepeta* ranges from the Mediterranean region to East Asia. However, it is most species rich in

the mountainous areas of the western Mediterranean, southwest Asia, and the western Himalayas. This study examines the taxonomic position of the genus Kudrjaschevia. Some researchers have treated it as a distinct genus, while others consider it part of Nepeta. The research conducted in this project is looking to see if Kudrjaschevia is in fact a distinct genus, or if it is part of Nepeta. To test this hypothesis, we used chloroplast and nuclear DNA and performed PCRs to amplify the nuclear gene regions ITS, ETS, PPR-AT3G09060, PPR-AT1G09680, and chloroplast regions ycf1, ycf1-rps15, rpl32-trnL, and trnL-trnF. Based on that data, we conclude that Kudrjaschevia is embedded within the Nepeta group. Therefore, Kudrjaschevia should not be considered as a separate genus but should instead be considered part of Nepeta.

Poster U43 – Caleb Rother

Mentor: Austin Nuxoll

Title: *Identification of Staphylococcus Lugdunensis Proteases Through Ethyl Methanesulfonate Mutagenesis*

Staphylococcus lugdunensis, like *Staphylococcus aureus* and *Staphylococcus epidermidis*, is common in the human skin flora. Despite *S. lugdunensis* causing aggressive and often hard to treat infections, the pathogenesis of this organism remains largely understudied. Numerous proteases have been connected to pathogenesis and immune evasion strategies in the closely related pathogens, *S. aureus* and *S. epidermidis*. To identify proteases that *S. lugdunensis* employs in these processes, we designed a high-throughput screen following ethyl methanesulfonate (EMS) mutagenesis. These mutants were then separated using a cell sorter and grown in a 96 well plate. Using this library, we screened for differences in proteolytic activity in comparison with wild type *S. lugdunensis*. The library of EMS treated *S. lugdunensis* was grown for 48 hours at 37°C before plating on a blood-agar plate. After 48 hours of incubation at 37°C, proteolytic activity was determined by a zone of clearing. Mutants exhibiting decreased proteolytic activity will be confirmed and growth kinetics will be assessed for growth defects. Individual mutants will then be sequenced and analyzed to determine mutations responsible for protease activity. Further studying of *S. lugdunensis* proteolytic activity offers important insight into the pathogenesis of this organism.

Poster U44 – Kaitlyn Berggren

Mentor: Keith Geluso

Title: *Composition of Small Mammal Populations in Urban Parks in Kearney, Nebraska*

Globally, human populations are increasing that result in an increase in urban development across landscapes. As urban populations increase, natural areas are

converted into developed areas to meet increased human demands of living in dense communities. These alterations to landscapes can result in habitat fragmentation. Fragmentation creates isolated, small, disconnected areas of lands, or green spaces, separated and surrounded by roads, buildings, and other infrastructures. Green spaces can act as refuges for wildlife and promote biodiversity. Urban parks, an example of green spaces, often are composed of natural or semi-natural vegetation, but some are highly manicured. Small mammals are some of the species able to survive in isolated urban green spaces but there are various species, including native and exotic types. The objectives of our study are to determine: 1) what species of small mammals occur in natural areas and city parks within urban areas of Kearney, Nebraska, 2) if the more natural or diverse habitats have higher species richness and relative abundances than those highly manicured, and 3) how does the abundance of common species captured in urban areas compare with areas outside of city limits. We hypothesized that urban parks with more natural or diverse habitat will have increased species richness and abundance. From a preliminary trapping (1 night at Kearney High School ditch), more exotic species were captured than native species. Impacts of this study will show how urbanization and parks affects abundance and richness of small mammal species and how management of urban parks influences small mammal populations in a small urban community.

Poster U45 – Dawson Kosmicki

Mentor: Keith Geluso

Title: *Seasonal Distribution by Month for Evening Bats (Nycticeius humeralis) in North America*

The Evening Bat (*Nycticeius humeralis*) is a migratory, cavity-roosting tree bat that occurs throughout the eastern United States. In the western and northern parts of its distribution, the species is expanding into states such as Minnesota, Nebraska, Texas, and New Mexico. Not much is known about migratory patterns and where this species resides in different seasons of the year. We analyzed seasonal distribution patterns by amassing specimen data from the Global Biodiversity Information Facility website (GBIF.org) and plotted coordinates on ArcGIS for specimen records across both the U.S. and Mexico. By splitting records into 12 maps by month, distinguishing between the sexes, we can discern areas occupied seasonally by sex and how their movement patterns differ. Preliminary results suggest that adult females disperse farther north and east from wintering grounds while adult males might not migrate as far. In the southeastern U.S., some adult females occur year-round, as not all females appear to migrate. Those that do migrate succumb more often to fatalities associated with wind turbines than non-migratory individuals. Knowing where and when this species migrates will assist the wind energy facility operators and biologists with strategies to reduce turbine use when bats migrate through, moderating mortality rates to help conserve this and other migratory, tree-roosting species.

Poster U46 – Conner Brown

Mentor: Yipeng Sui

Title: *The Dyslipidemic Effects of Cannabidiol Mediated by Pregnane-X Receptor*

Cannabidiol (CBD) is an alternative medication commonly used in treating pain, anxiety, inflammation, and insomnia. It is implied that CBD is associated with cholesterol homeostasis, but it is still unclear how chronic exposure to CBD influences human lipid metabolism. Our preliminary data suggest that CBD is an agonist for human Pregnane X Receptor (PXR), a xenobiotic nuclear receptor, which is established to play a role in atherosclerosis and hyperlipidemia in mammals. In the current study we use human intestinal cells, human hepatic cells, and mouse models to study if CBD affects lipid metabolism through a PXR-mediated pathway. Our data suggest that CBD activates PXR in a dose-dependent manner. The presence of CBD induces the cholesterol uptake by human intestinal LS180 cells, but not in PXR inhibitor-treated cells. Wild-type mice fed CBD display increased circulating total cholesterol levels in a PXR-dependent way. Our study is the first to explore the cellular and molecular mechanisms by which exposure to CBD activates human PXR and increases the risk of dyslipidemia.

Poster U47 – Carter Moss

Mentor: Austin Nuxoll

Co-Authors: Kenan Brodd, Alexis Hobbs, Kim Carlson

Title: *Investigating the Potential Survival Advantage of Staphylococcus aureus Persisters within a Macrophage Environment*

Staphylococcus aureus is a component of human microflora that typically exists benignly within the skin and nasal cavities of 30% of the population. However, under the right conditions, *S. aureus* acts as an effective opportunistic pathogen linked to inducing several diseases and nosocomial infections. Consequently, despite medicinal efforts, *S. aureus* has evolved various ways to circumvent both antibiotics and aspects of the innate immune system. Professional phagocytes, predominately macrophages and neutrophils, are critical innate immune cells that interact with *S. aureus*, acting as a line of defense against the bacteria to resolve infection via phagocytosis. Yet interestingly in recent studies, *S. aureus* persisters, which are a subpopulation of cells with lower metabolic activity, have been shown to exhibit a survival advantage against innate immune components, namely antimicrobial peptides. Given this, we reasoned persisters may also possess a survival advantage to other components of innate immunity such as macrophages. To investigate this, we utilized a wild type *S. aureus* strain, HG003, and a high persister strain, fumC::N Σ to determine whether persisters were better able to survive within macrophages post phagocytosis. Furthermore, we employed a persister marker, Pcap5A::dsRed to monitor whether *S. aureus* cells with the highest expression of the persister marker are more adept to survival within a

macrophage. Understanding *S. aureus*'s subversion and exploitation of these multifaceted innate immune system interactions may prove paramount for comprehending host-pathogen interactions.

Poster U48 – Theo Huber

Mentor: Keith Geluso

Title: *Natural History of Striped Bark Scorpions in Nebraska*

Numerous studies have focused on scorpions, primarily concentrating on their behaviors in deserts or other arid regions. These studies, which often use ultraviolet lights, have contributed to a better understanding of energy flow and other ecological factors in these environments. However, scorpion behaviors in other terrestrial ecosystems, such as grasslands and woodlands, have not been well studied. One scorpion that commonly inhabits grasslands is the Striped Bark Scorpion, *Centruroides vittatus* (Shelley & Sissom, 1995). The wide range of ecological habitats and large geographic range make the Striped Bark Scorpion well suited for ecological studies. The Striped Bark Scorpion's habitat spans from eastern New Mexico to western Louisiana and from south Texas to its furthest north distribution of Thayer County, Nebraska and one population found in western Illinois (Shelley & Sissom, 1995). In several states, *C. vittatus* is the only scorpion reported: Kansas, Nebraska, Missouri, Illinois, Arkansas, and Oklahoma. The objective of this study is to address this research gap by documenting the activity patterns, density, and feeding habits of the Striped Bark Scorpion in Franklin County, Nebraska, where it has not been previously observed. Ecological studies of this scorpion have been conducted in west Texas (Brown et al., 2002), southern Texas (McReynolds, 2004), and northwestern Arkansas (Yamashita, 2004). The biology of the Striped Bark Scorpion in more temperate climates remains largely unstudied. By focusing on this species in Franklin County at the northernmost part of its distribution, this research aims to contribute valuable insight into scorpion behavior beyond the arid landscapes that have traditionally dominated scientific attention.

Poster U49 – Megan TenBensel

Mentor: Jayne Jonas-Bratten

Co-Author: Bryan Drew

Title: *Effects of fire in grazed grasslands*

Historically, fire has been a restorative process for biological plant diversity in grasslands worldwide. Fire reduces the impact and spread of invasive plant species, and resets ecosystems to allow for the inhabitation of a greater number of native flora. In late April of 2022, the Road 702 Wildfire ravaged an estimated 41,155 acres in Furnas County, Nebraska. This extreme wildfire impacted the wildlife, the soil

microbes, and the plant populations while offsetting the rhythm of the previous ecosystem. This study intends to determine the influence the Road 702 wildfire had on plant cover in agriculturally grazed settings. Specifically, this study compares three different pastures: One pasture has been impacted by both the fire and overgrazing due to cattle, the second was impacted by the fire but was not grazed, and the third pasture, a control, consists of a piece of land that was not impacted by the fire, and has not been grazed for two decades. We used a random sampling collection quadrat method to measure cover and diversity within the different pastures. Current results show that out of 48 individual species, 12 are non-native, and 36 are native. The grazed and burned pasture had 6/26 non-native plant species. The not grazed and burned pasture had 5/27 non-native plant species, and the not burned and ungrazed setting had 6/22 non-native plant species. The pasture which is not grazed and was not burned contains the highest relative ratio of non-native to native plant species. We will continue to collect more data in summer 2024 to determine greater significance of species interactions and richness. This study will help inform fire prescription management techniques by elucidating plant diversity patterns under the influence of fire and grazing.

Poster U50 – Ariel Rhea

Mentor: Nicholas Hobbs

Title: *Effect of androgen receptor on over-mark preference in female mice*

Many mammals, including rodents, communicate through scent marks. These scent marks serve multiple functions, including as a form of competition or in attracting potential mates. When one animal places its mark on or near that of another animal, an over-mark is created. In response to overmarks in which the top- and bottom-scent donors are similar in condition, rodents of various species show a preference for the scent mark of the top-scent animal compared to that of the bottom-scent animal. This preference may be altered if the two animals differ in some aspect of their condition, such as gonadal hormone or nutritional status. Currently, it is unknown what role, if any, the receptors to these hormones play in how rodents respond to over-marks. The goal of the current study is to understand how female mice respond to the scent mark of a wildtype (wt) male mouse compared to that of a testicular feminization mutant (tfm) mouse. Tfm male mice possess a mutation that results in a dysfunctional androgen receptor (AR). As such, tfm mice having significantly less circulating testosterone compared to their wildtype (wt) siblings and furthermore, their bodies do not respond to testosterone. To perform this study, urine was collected from wt and tfm mice. Female mice were exposed to an over-mark in which the top- and bottom-scent male mice differ in their AR status. After the exposure phase, the amount of time female mice spent investigating the separated scent marks of the top- and bottom-scent male mice was recorded to determine if there was a preference for either scent donor. This study

will help determine if the presence of functional AR in male mice affects how female mice respond to their scent marks.

Poster U51 – Joseph Roeder

Mentor: Joseph Dolence

Co-Authors: Marissa Hoover, Zane Carlson

Title: *Vaping inhibits the adaptive immune response to peanut*

Amidst growing popularity, the health effects of vaping remain unclear, especially how it impacts immune responses initiated within the lung. Our lab has shown that mice can be made allergic to peanut (PN) via inhalation and recent data suggests this likely happens in humans. Our lab has compelling data that exposure to either vape juice or electronic conditioned media (ECM) (made by bubbling vapor into media) during exposure to PN inhibits the generation of PN-specific antibody responses and leads to milder anaphylactic challenges upon PN challenge. In this study, we sought to examine whether ECM influences the ability of B and T cells to respond to PN using flow cytometry. First, we designed a staining panel to discriminate CD19+ B cells, CD4+ ST2+ CXCR5- T helper 2 (Th2) cells, and CD4+ CXCR5+ ST2- T follicular helper (Tfh) cells within lung draining lymph nodes of mice. Second, we exposed mice to PBS, PN, ECM, or PN in ECM using the same two-week inhalation model that showed that ECM stifled PN-specific IgE and IgG1 responses. Following the exposure period, lung draining lymph nodes were harvested and processed for flow cytometric analysis. Preliminary data suggests Tfh cells, but not Th2 cells, displayed reduced reactivity to PN due to exposure to ECM. CD19+ B cells appeared similar between mice exposed to either PN or PN in ECM. Taken together, this data suggests that vaping suppresses PN-specific immune responses. This knowledge is important because failure to mount response against the clinically relevant PN antigen strongly suggests that vaping may inhibit immune responses against common respiratory infections such as the viruses that cause the common cold and influenza. More studies are needed to more fully comprehend the mechanism by which vaping influences the development of immune responses against PN.

Poster U52 – Clare Plachy

Mentor: Nicholas Hobbs

Title: *The Role of Androgen Receptors on Scent Marking Behavior in Mice*

Scent marking, a behavior observed in various mammalian species, plays a vital role in communication, territory establishment, and social dynamics. While hormones, such as testosterone, influence scent marking, the specific role of androgen receptors (AR) in organizing the brain for this behavior remains unclear. Male mice possessing a mutation which produces a dysfunctional androgen receptor (AR), known as testicular

feminization mutant (tfm) male mice exhibit a decreased interest in the scent marks of female mice relative to wildtype (wt) male mice, which possess functional AR, suggesting that other olfactory behaviors may be altered as well. As such, we tested the hypothesis that the presence of AR affects the scent marking behavior of male mice in response to scent marks provided by wt female mice. Ten scent marks from the wt female scent donor were placed on 1 side of a paper, that was then dried and marked with pencil under UV light to identify the bottom-scent donor's marks. Then the wt males and tfm males were placed on the paper in a scent marking arena and allowed to explore freely for 10 minutes. Following this, the paper was dried and marked again under black light using red ink. The number and location of these over-marks were recorded and analyzed to determine if any differences in scent marking behavior existed due to differences in AR. Preliminary findings suggest potential differences in scent marking between wt and tfm male mice, laying way for ongoing analyses, including the collection and chemical analysis of pheromones from tfm males, wt males, tfm carrier female, and wt females. This research contributes to a deeper understanding of the connection between hormonal signaling and scent marking behavior in rodents.

Poster U53 – Payton Sindelar

Mentor: Surabhi Chandra

Co-Author: Surabhi Chandra

Title: *Effect of High Glucose on Focal Adhesion and Rho Kinase in Breast Cancer Cells*

Chronic diabetes exacerbates several health conditions including cancer. Concomitant diabetes and breast cancer have been associated with high mortality. Our lab has previously shown that polyamine pathway is involved with the proliferation of breast cancer cells, however specific enzymes involved in this pathway have not been fully investigated. Moreover, phytochemicals such as black seed oil (BSO) have been shown to have cytotoxic potential in certain cancers but its role in diabetic breast cancer has not been explored yet. The hypothesis of this study was that cytoskeletal modulating enzymes focal adhesion kinase (FAK) and Rho kinase are downregulated in high glucose conditions in breast cancer cells, and this effect can be prevented using BSO. Triple negative breast cancer cells, MDA-MB-231 and estrogen positive cells MCF-7, were used for the study and treated with varying concentrations of glucose and BSO. Western blot technique was performed for protein analysis. It was observed that the protein levels of FAK and Rho kinase (ROCK1 and ROCK2) fluctuate with high glucose treatments. Experiments in combination with BSO prevented any changes in the levels of FAK and Rho kinase. Since these enzymes are involved with cell structure and function, it is likely that they can affect cell metastasis as well, and BSO can be protective in these conditions.

Poster U54 – Emily Flowers

Mentor: Surabhi Chandra

Co-Author: Bianca Aguilar

Title: *Inhibition of Metastasis of Triple Negative Breast Cancer Cells by Black Seed Oil and Thymoquinone*

Patients with breast cancer have a higher than likely chance of further cancer metastasis to the bones, lymph nodes, lungs, liver, brain, etc. There has been limited success in finding methods of reducing this metastatic behavior of the cells. We studied black seed oil (BSO) and the active compound from BSO, Thymoquinone, often used as over-the-counter health supplements with anti-cancerous properties. Thymoquinone has been shown to be active as an anticancer agent, and BSO can reduce inflammation and diabetes, therefore we hypothesize that either black seed oil and thymoquinone will reduce migration and metastasis of breast cancer cells. To test this hypothesis, scratch wound assays were performed with MDA-MB-231 cells (late-stage metastatic triple negative breast cancer cells). Cells were split and subsequently treated with 0 μ l (control), 1 μ l, and 2 μ l of Thymoquinone in DMSO, as well as 0 μ l, 2 μ l and 4 μ l of Black Seed Oil. The cells were viewed at 0 hours and 24 hours and images were taken to record metastatic behavior and invasion of the scratch wound. The findings show that there was limited inhibition of metastasis using Black Seed Oil at 2 μ l and 4 μ l. Total cell death was seen at 2 μ l of Thymoquinone treatment, at the 1 μ l Thymoquinone treatment is under further analysis to determine its exact effects.

Poster U55 – Maddie Bengston

Mentor: Jacob C. Cooper

Co-Authors: Maddie Bengston, Letty Reichart, Jacob C. Cooper

Title: *For the birds or the birders? Issues with modeling nocturnal birds in Nebraska*

Nebraska offers diverse habitats including grasslands, wetlands, and forests that house a diverse bird community. Birding (i.e., birdwatching) enthusiasts have many opportunities to observe and study the behavior of various bird species and often report sightings to online databases, such as eBird, a citizen science database. Data on such websites can include habitat, elevation, and topography, which can be used to create models that estimate the relative abundance of species, predicting how rare or common a species is in certain areas. While these models use bird-important information, like the environment, a large contribution to models is determined from human effort combined with other models, leading to potential biases. We studied the abundance models of select bird species with different life histories in Nebraska, constructed by eBird. These characteristics included nocturnal, diurnal, noticeable (i.e., large), or easy to overlook (i.e., small and/or shy). The highest relative abundance for

sightings was observed for those species that are more obvious and diurnal, whereas smaller and nocturnal or harder-to-find species occurred at much lower relative abundances. We concluded that the accuracy of these models ultimately relies on the motivations and behavior of birders. Some birders may focus on certain species, and most birding tends to be conducted during daylight hours which can affect nocturnal species models. We observed that abundance models least accurately predicted the spatial abundance of nocturnal birds, which can have significant implications for conservation efforts.

Poster U56 – Jordan Carfield

Mentor: Jayne Jonas-Bratten

Title: *Root Responses to Herbivory of Black-Eyed Susan and Big Bluestem From Nebraska and Texas*

Plant species in approved conservation seed mixes may have been produced in locations far from where they will be planted, and this could affect how successful the planting and growth of these plants are. From previous studies we know root biomass distribution and below-ground processes are the main drivers of plant community structure which makes it important to understand. My project is to examine if the origin of seeds, despite being the same species, impacts the growth of roots compared to shoot growth. I am also addressing how herbivory affected below ground biomass in plants originating from these seeds, specifically the impact on above- vs. belowground carbon allocation. Seeds of *Andropogon gerardii* and *Rudbeckia hirta* collected from Texas and Nebraska were grown in a greenhouse, a subset of plants being subjected to herbivory of grasshoppers. Root and shoots were harvested so we could analyze their biomass and carbon content. As expected, grasshopper herbivory has decreased total root biomass and allocation of growth of roots relative to shoots. Root dynamics appeared to have less of a response between plants originating from Nebraska or Texas. Additional analysis will explore possible interactions between seed origin and herbivory as well as above vs belowground carbon dynamics. Carbon dynamics may be important given their role in grassland carbon sequestration.

Poster U57 – Carlos Hernandez

Mentor: Alexis Hobbs

Co-Authors: Kim Carlson, Joseph Dolence

Title: *Development of a Peanut Allergy Model using *Drosophila melanogaster**

The use of *Drosophila melanogaster* for the study of peanut allergies is not common, although it is effective, and budget friendly. *D. melanogaster* has been shown useful for human studies due to their similar genome. The objective of this study was to determine if the immune regulated genes within the *D. melanogaster* genome were affected by the exposure of peanut. For this study, virgin male and female flies were

collected and placed into cages. The flies were fed cornmeal-molasses food with water or 5% peanut on top, water being the control. Every 72 hours the dead flies were collected, and food was replaced. qRT-PCR was performed on three-day intervals across the lifespan of the flies. These results show a significant down-regulation of Dorsal and an up-regulation of Dif, Cactus, and Relish. This shows the Toll pathway is potentially involved in allergic reaction, as well as the Immune Deficient pathway. This means that *D. melanogaster* provokes an immune response to peanut and can potentially be used as a model for peanut allergy in the future.

Poster U58 – Zane Carlson

Mentor: Joseph Dolence

Title: *Vaping impacts immune response to common allergens*

In recent years, vaping has become very popular. However, the health impact of vaping on the lungs, especially on immune responses that originate in the lung, remains unclear. We have shown that mice can develop peanut (PN) allergy via inhalation and recent data suggests this likely happens in humans as well. In this study, we examined whether vaping can impact the ability of the immune system to mount allergic responses against PN following allergen inhalation. Mice exposed to PN sensitization solution made with vape juice containing 0 mg/mL nicotine showed mild decreases in PN-specific IgE. Levels of PN-specific IgE were severely reduced in mice exposed to PN sensitization solution made with 3 mg/mL nicotine vape juice. The mice exposed to PN in the 3 mg/mL nicotine vape juice also displayed less MCPT-1 following PN challenge, suggesting these mice underwent milder PN-induced anaphylaxis. This data suggested that exposure to vape negatively impacts the ability of the immune system to develop allergic responses to PN. Since mice and humans aren't directly inhaling vape juice, we developed an electronic conditioned media (ECM) approach to expose mice to the effect of vapor made from a vape device. To make ECM, we bubble vapor into the media used to expose the mice to PN and ask whether the vapor itself alters immune response to PN. Mice exposed to PN in ECM displayed lower PN-specific IgE and PN-specific IgG1 compared to mice exposed to PN alone. Future studies will build on these findings by studying whether nicotine within the ECM plays a role in inhibiting PN-specific responses. Furthermore, we plan to examine whether exposure to ECM influences the cells responsible for mounting allergic immune response to PN. Taken together, this data strongly suggests that vaping stifles PN-specific immune responses. More studies are needed to understand how vaping influences the development of immune responses against PN. Such information is necessary to obtain for us to better understand how vaping may impact immune responses against common respiratory infections.

Poster U59 – Paiton Hancock

Mentor: Dawn Simon

Co-Author: Jonathan Schardt

Title: *Correlation of Veillonella Bacteria with Oral Health*

Veillonella is a common bacteria found within the oral microbiome, particularly in association with dental caries in children. Thus, the presence of *Veillonella* may be indicative of an individual's overall oral health. The oral microbiome composition, including *Veillonella* can change in the presence of other diseases, such as GERD, thus better understanding *Veillonella*'s prevalence in the oral microbiome may have consequences beyond oral health. In this study, our goal was to understand the prevalence of *Veillonella* in healthy college-aged individuals and determine if a correlation between prevalence and self-reported oral health exists. Previous studies have been conducted in a different demographic, primarily younger children in other countries. We utilized one-step PCR to identify species of *Veillonella* within the oral microbiome from tongue biofilm samples. In this study, we examined 48 participants with varying oral health status. We identified *V. atypica*, *V. parvula*, *V. dispar*, and *V. rogosae* within the sample population. The species composition in the very poor to average group and good to excellent groups shared 72% of the same species. Our results did not indicate a significant difference between the composition of species present in the very poor-average sample group and the good/excellent. Based on prior studies, we expected to see *V. atypica*, *V. dispar*, and *V. rogosae* amongst healthy adults. While we did identify these species, we also identified *V. parvula* indicating an increase in species diversity of *Veillonella* in adults in the US compared to prior studies. This is likely due to geographic and age differences, which are known factors that affect the oral microbiome. The current results do not indicate significant differences between species in *Veillonella* in adults, however this research is important for furthering our understanding of the oral microbiome and how changes may impact an individual's overall health.

Poster U60 – Wangeci Kariuki

Mentor: Yipeng Sui

Title: *Pregnane X Receptor Links a Plasticizer Alkylsulphonic Phenyl Ester to Dyslipidemia*

Cardiovascular disease (CVD) is still the leading cause of mortality and morbidity worldwide. Our chemical environment has changed substantially, and recent human studies have implicated a novel link between exposure to endocrine-disrupting chemicals (EDCs) and CVD. Pregnane X receptor (PXR), a nuclear receptor activated by various dietary steroids and environmental chemicals, has been associated with a lipid-dependent metabolism. Our preliminary data in human hepatic HepG2 cells suggested that alkyl sulphonic phenyl ester (ASE), a non-phthalate universal plasticizer

for a wide range of polymers, could increase the activity of human PXR. Studies have shown that ASE is found in dust particles and soil and influences the production of lipids in the body, the lipolytic reaction, and the fatty acid uptake. It is still unclear how ASE alters the lipid metabolism. In this study, we use in vitro and in vivo approaches to investigate the impact of ASE on PXR activation and lipid homeostasis. ASE activates PXR dose-dependent and promotes the dissociation between human PXR and its nuclear corepressors. For the in vivo study, wild-type male mice were orally gavaged with corn oil containing ASE daily with PXR-specific antagonist Resveratrol (RES) for a week. Plasma total cholesterol levels were increased by ASE treatment in a PXR-dependent way. Intestinal PXR target genes and the lipogenic genes were analyzed by QPCR assay. Mechanistically, ASE induced the cholesterol uptake by human intestinal LS180 cells in a PXR-dependent way. Our future study aims to use the computational docking study, mutagenesis analysis, and cell-based transfection assay to identify the critical amino acid residues within the PXR binding pocket associated with the interaction between ASE and PXR. Our study could provide a novel insight into how exposure to certain EDCs increases CVD risk in humans and elucidate the role of PXR as a mediator of EDC-elicited dyslipidemia for future environmental chemical risk assessment.

Poster U61 – Austie Kreikemeier

Mentor: Gregory Pec

Title: *Impact of redroot pigweed invasion on root-associated fungi and plant-soil feedback in continuous corn monocultures*

As global population growth surges towards an anticipated nine billion in the next fifty years, meeting the heightened demand for agricultural yield raises concerns regarding environmental sustainability. Current monoculture practices and excessive chemical inputs contribute to land degradation, disease outbreaks, and invasive species proliferation, posing substantial challenges for sustainable agriculture. Redroot pigweed (*Amaranthus retroflexus*), a native invader in North America, emerges as a formidable competitor against crops like corn (*Zea mays*), exhibiting prolific seed production, herbicide resistance, and allelopathic effects. Furthermore, redroot pigweed is known to harbor a diverse soil microbiota, including pathogens and saprotrophs, potentially influencing plant-soil feedback (PSF). In this study, we investigate the impact of redroot pigweed invasion on the mycobiome and subsequent PSF in a continuous corn monoculture system. Field soils were collected from a corn monoculture recently invaded by redroot pigweed, and a growth chamber study was conducted to systematically analyze the root-associated mycobiome's role in corn performance. Analysis of fungal communities revealed intriguing insights into the effects of redroot pigweed invasion on root-associated fungal richness, diversity, and composition. Preliminary results indicate a shift in fungal community composition on roots of corn in soils conditioned by redroot pigweed, suggesting a potential alteration

in the fungal landscape due to the invasive species. Specifically, redroot pigweed-conditioned soils exhibited alterations in fungal richness and diversity compared to native field soils and significant differences were observed on the roots of corn in the composition of fungal communities between redroot pigweed-conditioned soils and native field soils. Specific fungal taxa associated with redroot pigweed invasion may play a crucial role in shaping the microbial environment. For example, there was a higher abundance of *Fusarium* spp. on the roots of corn in soils conditioned with redroot pigweed; while soils not invaded by redroot pigweed tended to have higher presence of *Trichoderma* spp. on the roots of corn, which may suggest an increase in biocontrol activities in the soil leading to a reduction in soil-borne pathogens. We also hypothesized that the observed changes in fungal community richness, diversity, and composition in redroot pigweed-conditioned soils may influence the PSF experienced by corn. Certain fungal taxa such as *Mycena* spp. may promote a beneficial invasion legacy effect on corn rooting systems, potentially contributing to the observed trend towards a higher root-to-shoot ratio. Taken together, an understanding of the nuanced interactions within the soil mycobiome induced by redroot pigweed invasion provides crucial insights into potential consequences for plant performance. Our findings contribute to the broader understanding of how invasive species can shape soil microbial communities, influencing plant-soil feedback and agricultural productivity.).

Poster U62 – Josh Paisley

Mentor: Bryan Drew

Title: *Effects of Salvia azurea on Insect Species*

As global population growth surges towards an anticipated nine billion in the next fifty years, meeting the heightened demand for agricultural yield raises concerns regarding environmental sustainability. Current monoculture practices and excessive chemical inputs contribute to land degradation, disease outbreaks, and invasive species proliferation, posing substantial challenges for sustainable agriculture. Redroot pigweed (*Amaranthus retroflexus*), a native invader in North America, emerges as a formidable competitor against crops like corn (*Zea mays*), exhibiting prolific seed production, herbicide resistance, and allelopathic effects. Furthermore, redroot pigweed is known to harbor a diverse soil microbiota, including pathogens and saprotrophs, potentially influencing plant-soil feedback (PSF). In this study, we investigate the impact of redroot pigweed invasion on the mycobiome and subsequent PSF in a continuous corn monoculture system. Field soils were collected from a corn monoculture recently invaded by redroot pigweed, and a growth chamber study was conducted to systematically analyze the root-associated mycobiome's role in corn performance. Analysis of fungal communities revealed intriguing insights into the effects of redroot pigweed invasion on root-associated fungal richness, diversity, and composition. Preliminary results indicate a shift in fungal community composition on

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Poster U63 – Hernan Vargas

Mentor: Surabhi Chandra

Title: *Effects of Glucose and Focal Adhesion Kinase Inhibitor on the Cytoskeletal Structure of Breast Cancer Cells*

Breast cancer patients with concomitant diabetes have poor survival rates due to chemoresistance and metastasis. Reorganization of the cytoskeleton is crucial to cell migration and metastasis. Regulatory protein such as focal adhesion kinase (FAK) play a key role in cell mobility. Hence, it is hypothesized that diabetes affects the cytoskeletal structure of breast cancer cells through the FAK pathway. Breast cancer cells (MCF-7) were treated with varying concentrations of glucose in combination with FAK inhibition and cell morphology and elasticity was monitored using atomic force microscopy (AFM). Cells were grown in DMEM/F12 media supplemented with 5% fetal bovine serum. Cells were subsequently treated with 5 mM glucose (low glucose), 25mM Glucose (high glucose) in the presence of FAK inhibitor (10uM). The cells were fixed with methanol and analyzed using AFM in the Physics department. Our results show that high glucose treatments significantly reduce the elasticity of the cells, and this is mediated through the FAK pathway. This research hopes to prove that diabetes has a direct effect on cancer and can cause an acceleration in progression and a higher mortality rate.

Poster U64 – Lauren Bahe

Mentor: Keith Geluso

Title: *Surveying Herpetofauna Diversity at Ash Grove Wildlife Management Area, Franklin County, Nebraska: Exploring the Presence of Slender Glass Lizards*

The Ash Grove Wildlife Management Area (AGWMA) in Franklin County, Nebraska, is home to many species of herpetofauna. This rocky grassland is crucial habitat for many of these species of reptiles and amphibians, as a number of species reach their northernmost limits in such limited habitats in the state. The Slender Glass Lizard (*Ophisaurus attenuates*) is of particular interest due to its elusive nature and minimal documentation in Nebraska. This study aimed to conduct a comprehensive inventory of herpetofauna using visual encounter surveys (VES) to assess the occurrence and abundance of these organisms. Field surveys spanned over 7 months, April to October of 2023, with added data spanning from 2020 to 2022 for comparison of species richness and diversity. Thus far, we have documented fourteen species. While our data from this recent year did not reveal any new sightings of the Slender Glass Lizard, we discovered two new geographic distribution records for Franklin County, including the Great Plains skink (*Plestiodon obsoletus*) and Dekay's Brown Snake (*Storeria dekayi*). This study also provides valuable insights into the ecological requirements and possible conservation needs for herpetofauna of the AGWMA ecosystem. Without wildfires or prescribed fires on this landscape, many eastern red cedars are covering these rocky hillsides. Our limited surveys thus far demonstrate the importance of ongoing monitoring of herpetofauna to preserve biodiversity, enhance conservation efforts, and ensure a sustainable environment for future generations.

Poster U65 – Hailey Fuqua

Mentor: Letty Reichart

Title: *Vegetation Analysis and Water-holding Ability in a Restored Waterfowl Production Area*

Rainwater Basin wetlands provide important habitat for spring migratory waterfowl. The United States Fish and Wildlife Service manages restored basins in this region to provide stop-over habitat with important food resources. Over time restored basins fill in with sediment and undesirable vegetation becomes dominant in the basin.

Undesirable plant species do not provide the appropriate forage resources needed by spring migratory waterfowl. In March 2017 sediment was removed from Theesen Waterfowl Production Area (WPA) to restore vegetation that supports foraging needs for spring migratory waterfowl. For this project we resampled Theesen WPA in July 2023 to compare vegetation composition before restoration and after restoration. In addition, we also measured soil hardness across experimental units within the WPA to estimate potential water-holding ability. We collected samples from three experimental

units and from a control location where sediment was not removed. Preliminary data suggests that undesirable vegetation was reduced in areas where sediment was removed and water-holding ability was increased. Results of this study will be useful to inform habitat management for spring migratory waterfowl. Future research will also examine waterfowl use of habitat on restored sites.

Poster U66 – Ran Hirosawa

Mentor: Letty Reichart

Title: *Nest Site Identification of Eastern Screech Owls in Kearney, NE: Description of Nest Site Characteristics and Individual Variation in Recorded Calls*

Eastern Screech Owls are common residents of central and eastern North America, and are often found in forests, suburbs, and parks. They nest in natural tree cavities and will also nest in artificial nest boxes. Nesting locations for these birds is not well documented in many locations because they are active at night. Citizen science databases, such as eBird, have records of Eastern Screech Owls, although nest sites are not always identified. For this study we will document breeding behavior of Eastern Screech Owls that occur within the city limits of Kearney, Nebraska. We will identify nesting sites, then record calls for individuals to document breeding behavior. Thus far, we identified two nesting locations and recorded one call. We are just beginning field work for this project and expect to find more nests and record additional calls from multiple individuals. We will use this data to describe nest site characteristics of Eastern Screech Owls breeding within city limits of Kearney, Nebraska. In addition, we will examine individual variation for recordings. This project will provide additional information regarding the nesting ecology of Eastern Screech Owls in suburban habits.

Chemistry

Poster U67 – Daichi Maruyama

Mentor: Scott Darveau

Title: *Quantification of Reactive Oxidants in CWA Decontamination Hydrogels by Raman Spectroscopy*

Effective decontamination systems against chemical warfare agents (CWAs) are crucial for safeguarding human health and safety. Hydrogel-based systems utilizing a composition of polyvinyl alcohol (PVA), borax, and sodium perborate (which produces hydrogen peroxide in-situ) have shown promise in neutralizing non-sulfur CWAs, but their effectiveness against sulfur-containing molecules has been limited. The addition of ammonium bicarbonate to hydrogen peroxide containing solutions produces

peroxymonocarbonate ion, HCO_4^- , a more potent neutralizing agent. Initial attempts to observe HCO_4^- in the base formulation were unsuccessful. The direct addition of hydrogen peroxide is proposed to increase the peroxymonocarbonate ion formation. This research focuses on elucidating the reaction kinetics of peroxymonocarbonate ion formation within an active hydrogel system. The primary aim is to understand the mechanisms and rate of both H_2O_2 and HCO_4^- generation. To achieve this, we are employing Raman spectroscopy for the quantitative analysis of these species. Because Raman spectroscopy is sensitive to a variety of experimental parameters, not all of which can be controlled, we must use the internal standard technique to successfully quantify the reaction product. The current phase of the research involves the use of potassium perchlorate (KClO_4) as a standard for calibrations, ensuring accurate and reliable quantitative measurements. We report the linear calibration of both hydrogen peroxide and peroxymonocarbonate ion using this method. Direct measurement of these species in the hydrogel formation and observation of the effectiveness of this new formulation on CWA simulants will also be reported.

Poster U68 – Samantha Bursaw

Mentor: Kristy Kounovsky-Shafer

Co-Authors: Esmeralda Mendez-Ortiz, Kristy Kounovsky-Shafer

Title: *Creating Various Objects to Configure Resin 3D Printers*

The consistency and workability of machinery are vital when creating scientific devices such as our concentration device. 3D printers, such as the ELEGOO Mars 3 Pro 4k, often display unexpected results when being used for the first time or by inexperienced people. When working with these printers, troubleshooting was found to be a necessary process to ensure the sufficient building of objects. In this project, it was imperative to uncover the correct settings for making 3D objects, as well as the correct steps needed to fix unfit objects. An object with smaller details and various shapes was chosen to be a test subject, prior to printing our elution and concentration device on a different type of 3D printer. It was consistently made with ABS-Like photopolymer resin. This object then underwent a print with the device-recommended settings. When a print failed or was malformed, a setting was changed to see if the print would improve. A new trial would commence with different settings changed each time that a print failed. There were 8 trials in total. One trial resulted in the object being stuck to the platform. Two trials resulted in a malformed object. Four trials resulted in a failed print. The final trial was completed successfully with no issues. When printing an object in a 3D resin printer, settings must be adjusted based on what is being printed. Troubleshooting successfully uncovered the correct settings that should be used when creating objects.

Poster U69 – Nate Lilla

Mentor: Michael Moxley

Co-Author: Ein Obermiller

Title: *Mycobacterium Tuberculosis E3 Inhibitor Screening*

In 2022, according to the World Health Organization, *Mycobacterium tuberculosis* (TB) was second only to COVID-19 as the leading cause of death among communicable diseases. Our focus is on an enzyme called lipoamide dehydrogenase found in all organisms in the pyruvate dehydrogenase complex. This enzyme catalyzes the third reaction in the complex, called E3 for short, and is important for the viability of TB. We are interested in inhibiting MycoE3 to diminish its infectious ability. To do that, we have implemented molecular docking to virtually screen millions of compounds to assess and test their ability to bind the lipoamide binding site and then inhibit MycoE3. We are implementing a plate reader assay to follow the activity of MycoE3 so that we can experimentally test compounds obtained from the virtual screen. So far, we have seen that we can successfully assess and test the activity of MycoE3 and show that we can inhibit it using a published MycoE3 inhibitor. We are currently testing compounds determined through our virtual screening based on the known inhibitor that we have been using in the virtual screening.

Poster U70 – Esmeralda Mendez-Ortiz

Mentor: Kristy Kounovsky-Shafer

Co-Author: Jesse Boley

Title: *Using 3D printed devices to elute and concentrate S. cerevisiae DNA*

Identifying large variations in a genome can be cumbersome. However, using large DNA molecules that span the genomic variations aids in assembling the variation. However, due to the DNA molecule's large size, routine molecular biology techniques can break DNA. Therefore, a method is required to prevent the breakage of DNA during cell lysis and be able to concentrate DNA. To help concentrate the DNA, a bis-acrylamide roadblock was cured in the 3D-printed device to concentrate DNA at the interface between the roadblock and solution. *S. cerevisiae* DNA was stained with YOYO-1 and loaded into the 3D-printed device, and an electric field was applied. The device was imaged using a Canon camera and a blue light transilluminator. The DNA was stained with YOYO-1 dye to track the progression of DNA through the device. *S. cerevisiae* inserts were tested to determine how much DNA could be eluted and concentrated in the 3D-printed device. Finally, the DNA inserts were run on a PFGE to determine how much DNA remained in the insert and which size of molecules eluted from the insert.

Poster U71 – Trevor Dvorak

Mentor: Haishi Cao

Co-Author: Nolan Gleason

Title: *Investigation of a fluorescent approach based on 1,8-naphthalimides for the detection of Hydrogen Sulfide*

Hydrogen Sulfide (H₂S) is a colorless gas molecule that contains an overpowering, rotten-egg odor. H₂S in the human body is a gasotransmitter that is responsible for protecting neurons in the Central Nervous System from oxidative stress. It will slow the uptake of oxygen and reduce the oxidative effects that neurons typically endure. There are several neurodegenerative diseases in that H₂S could be a viable therapeutic agent; one, in specific, is Parkinson's disease. With the introduction of H₂S, it is theorized that H₂S would reduce much of the oxidative stress and neuron damage. This research group is working towards making a hydrogen sulfide detecting molecule through a multi-step organic synthesis. The research group will exchange substituent groups on the hydrogen sulfide detecting molecule and observe any fluorescent changes and properties that may be altered. When exposed to Hydrogen Sulfide, fluorescent changes will correlate to the detection, and amount, of Hydrogen Sulfide present. We will then undergo testing to find the fluorescent properties it contains to track the reaction as it detects Hydrogen Sulfide. Another aspect of our research is to look at the interaction of our molecule with other cellular molecules and see if there is any change that occurs via fluorescence tracking.

Poster U72 – Anna Law

Mentor: Christopher Exstrom

Title: *Tuning of visible silica alcogel gelation time using a two-step catalysis in the preparation of a silica sol for embedding into femtosecond laser processed surfaces*

Through femtosecond laser surface processing (FLSP), metal surfaces can be functionalized to enable fine control over wetting properties. Silica aerogels and xerogels may be embedded in the topmost nanoporous layers to provide structural stability. The reaction of tetraethoxysilane (TEOS) with either an acid or base catalyst in a water/alcohol solution results in a sol that can be absorbed by the FLSP surface prior to gelling. However, tuning the gelation time to industrial application specifications with a single catalysis step is very difficult without adding undesired ionic co-catalysts. We have investigated the effects of a two-step catalysis on visible gelation time. TEOS/ethanol/water solutions (1:9.2:4 mole ratio) with varying quantities of HCl(aq) catalyst (0 to 1 mol per mol TEOS) were heated to 60 °C for 1 hour and

cooled to 25 °C prior to adding varying quantities of NH₃(aq) catalyst (1:1 to 12:1 NH₃:HCl mole ratios). Control of visible gelation time (1 s – 48 hr) was achieved. Immediately after base catalyst addition, sols were introduced into Al-2219 FLSP surfaces through wicking or submersion. Cross-section scanning electron microscopy and energy dispersive x-ray spectroscopy analysis reveal that, after drying, silica xerogels remain embedded in the topmost Al-2219 nanoporous layers but capillary stresses during drying induce surface cracking. Wetting properties of the bulk gels and embedded FLSP surfaces will also be discussed.

Poster U73 – Francisco Cantillo

Mentor: Christopher Exstrom

Co-Author: Norikazu Igusa

Title: *Two-step catalyzed sol-gel preparation of hydrophobic silica xerogels containing perfluorinated alkyl groups: effects of base catalyst addition timing on product formation*

We report a new preparation of hydrophobic silica xerogels from the reaction of tetraethoxysilane (TEOS) mixed with up to 19.9 mol % 1H,1H,2H,2H-perfluorooctyltriethoxysilane and up to 17.8 mol % 1H,1H,2H,2H-perfluorodecyltriethoxysilane, respectively. In one method, TEOS/fluorinated silane/ethanol/water solutions containing HCl(aq) as a catalyst were heated to 60 °C for 1 hour and cooled to 25 °C prior to adding NH₃(aq) catalyst (12:1 NH₃:HCl mole ratio). In the second method, the fluorinated silane was not added to the reaction solution until after the heating/cooling period but right before the NH₃ addition. This method results in a more visibly transparent and uniform alcogel. It is possible that the direct condensation reaction between hydroxylated TEOS, Si(OH)₄, and ethoxy groups on the fluorinated silanes yields a more uniform distribution of perfluorinated side chains. Dried xerogels were characterized by FTIR spectroscopy, and spectra exhibited absorption peaks typically observed for Si-O-Si bending and C-F stretching vibrations.

Poster U74 – Jose Montanez

Mentor: Christopher Exstrom

Title: *Powder x-ray diffraction analysis of corn stover ash from three central states: effects of post-burning treatment temperature, grinding and cooling rate on potential cement strengthening*

Corn stover ash (CSA) is an emerging supplementary cementitious material that shows potential to replace fly ash in cement and concrete while lowering that industry's

carbon footprint. Powder x-ray diffraction was employed to screen CSA samples prepared from sites in Nebraska, Iowa, and Missouri for potential cement strengthening through pozzolanic reactions (due to presence of SiO_2) or CaCO_3 inert filler and reactive admixture mechanisms. CSA was produced via cyclonic burning of corn stover that had been dried after treatment with water and HNO_3 . Resulting ash samples were thermally treated at temperatures ranging from 500-800 °C for times ranging from 30 minutes to 4 hours. CSA that was ground or cooled rapidly after treatment showed higher percentages of SiO_2 among crystalline phases. The increase in thermal treatment temperature correlates to increasing formation of CaCO_3 .

Poster U75 – Noah Shackelford

Mentor: Michael Moxley

Co-Author: Allen Thomas

Title: *The Pursuit of Pyruvate Dehydrogenase Kinase Inhibitors to Treat Metabolic Disease*

The pyruvate dehydrogenase complex (PDC) is a complex of three enzymes that links the central metabolic pathways of glycolysis and the tricarboxylic acid cycle, and is regulated in part by its inhibitor pyruvate dehydrogenase kinase (PDK).

Overexpression of PDK, and therefore decreased activity of PDC, is associated with numerous metabolic disorders including various forms of cancer, type 2 diabetes, and heart disease. This project involved the virtual screening of 15 million compounds from the ZINC database against the lipoamide binding site of isoforms PDK 1-4. This search yielded eight compounds sharing a common biphenyl structure and high binding scores for the four isozymes of PDK found in humans. Of the eight compounds, six were synthesized in house, and assayed via absorbance associated with PDC activity. Two compounds inhibited PDK, restoring PDC activity in a concentration-dependent manner. Further research into these compounds and related structures is ongoing, with the ultimate goal of yielding compounds that can be used to treat metabolic disease.

The project described was supported by an Institutional Development Award (IDeA) from the National Institute of General Medical Sciences of the National Institutes of Health under Grant # 5P20GM103427.

Poster U76 – Jesse Boley

Mentor: Kristy Kounovsky-Shafer

Title: *Developing an insert holder for the elution and concentration device*

The elution and concentration of large DNA is a necessary process to be able to distinguish large structural variations in a genome. Having DNA molecules span the variation with enough unique information on both ends eases the assembly over the variation. Long DNA strands break easily so a method is needed to concentrate the DNA without breaking them. A 3D-printed mesofluidic device has been successful in concentrating and eluting lambda DNA molecules and concentrating DNA up to 660 kb. An electrical field is applied to the device which causes the negatively charged DNA to migrate towards the positive electrode and is concentrated between the agarose insert and a poly-acrylamide roadblock. To improve the efficiency of this process, the dimensions of the agarose insert holder need to be optimized. Three different sizes of insert holders have been devised and will be tested to determine how much DNA is eluted. This will help determine the optimal thickness of the agarose insert for elution and concentration.

Poster U77 – Tobias Kraft

Mentor: Hector Palencia

Title: *Organometallic Complexes of Silver with Antibacterial Properties*

Silver compounds are emerging as a promising alternative to conventional antibiotics, facing challenges due to rising antibiotic resistance. These compounds exhibit potent antimicrobial properties, targeting various microbes, including bacteria, fungi, and viruses. Their mode of action involves penetrating the cell walls of microorganisms, disrupting their essential functions, and inducing oxidative damage.

The versatility of silver-based antibiotics extends to numerous applications in fields like wound healing, medical devices, and water treatment. Notably, they have proven effective against infections caused by multidrug-resistant bacteria, such as MRSA and VRE. Silver can be used as nanoparticles or organometallic complexes, offering various options for combating microbial threats.

We have synthesized several cationic and non-cationic N-heterocyclic carbene-silver complexes and tested them as antimicrobials with *Staphylococcus Aureus* as a model. The minimum inhibitory concentration (MIC) was determined and compared against Vancomycin with promising results. The three most active complexes are being tested against other bacteria: *E. coli*, *B. subtilis*, *P. aeruginos*, *K. pneumoniae*, *S. epidermidis*, *S. enterica*, and serum. The results of these studies will be presented.

Poster U78 – Nolan Gleason

Mentor: Haishi Cao

Title: *Investigate the bio-function of H₂S in neuron-related disease.*

In our current project, our primary focus lies in the synthesis of a fluorescence sensor designed to detect the overall intracellular concentration of H₂S. Through extensive research, it has been observed that patients afflicted with neurodegenerative conditions such as Parkinson's disease, Alzheimer's disease, and Down syndrome exhibit diminished levels of intracellular H₂S. This deficiency contributes to neuronal damage induced by oxidative stress, which impacts cellular proteins. Our anticipation is that the developed sensor will accurately measure H₂S concentrations, shedding light on the biological significance of H₂S and its promising therapeutic implications.

Poster U79 – Prajna Das

Mentor: Mahesh Pattabiraman

Co-Authors: Joydip Chatterjee, Mahesh Pattabiraman

Title: *Extraction of Mint Oil from Various Mint Samples Using Distillation Technique and Analysis via Gas Chromatography*

This URF project involves extracting the natural oils from mint leaves and analyzing their chemical composition to determine their commercial viability for Nebraska farmers. The mint feedstock is sourced from UNL Scottsbluff campus, where Dr. Deepak Santra experiments with peppermint and spearmint strains with the motivation of identifying a strain that produces high crop yield with rich phytochemical composition. The experimental procedure involves taking approximately 5g of crushed mint leaves, mixing it with water, and heating the mixture to extract the distillate which contains mostly mint oil with some water. During distillation, 20ml of mint oil is collected in a large vial and then transferred to a 2ml small vial, which is subsequently analyzed using GCMS (Gas Chromatography Mass Spectrometry) to determine the chemical composition of the oil. These results assist Dr. Santra in identifying the most suitable mint leaves for production, enabling him to offer valuable advice to other farmers based on this information.

Poster U80 – Breyer Menke

Mentor: Kristy Kounovsky-Shafer

Co-Author: Martin Lopez

Title: *Making Inverted Agarose Inserts to Protect DNA*

Large DNA molecules enable easier assembly of larger variations. However, large DNA molecules are fragile and need to be protected during cell lysis. Therefore, a new method to protect DNA during cell lysis was needed. An inverted insert was invented to keep DNA inside the insert in liquid form, while having an agarose barrier to allow chemicals to diffuse through the agarose, while preventing the long DNA strands from leaving the center of the inverted insert. By making inserts out of agarose gel, it was possible to keep the DNA safe. To identify what sizes of DNA, remain in the insert, a dynamic range of agarose concentrations were tested with different DNA sizes. DNA concentration was measured using the DeNovix- DS-FX-11+ at four different time points: one, two, three, and four weeks.

Poster U81 – Seth Yarnell

Mentor: Christopher Exstrom

Co-Author: Jason Tovar Batres

Title: *Raman spectroscopy as a technique to characterize recycled concrete aggregate after reaction with pressurized carbon dioxide gas*

Raman spectroscopy is a laser scattering technique used to characterize vibrational motions in molecules and crystal lattices. Because the technique employs a confocal microscope, the laser may be focused on very small sample areas. This is advantageous in the study of concrete that could be recycled as aggregate in new concrete after the reaction with pressurized CO₂(g). Ca(OH)₂ and calcium silicate hydrate (C-S-H) in concrete both react with CO₂ to produce CaCO₃. This process, called carbonation, strengthens the concrete and sequesters the greenhouse gas from the atmosphere. We will demonstrate how Ca(OH)₂, C-S-H, and CaCO₃ can be detected with this technique and discuss mapping approaches that will enable carbonation kinetics studies.

Poster U82– Carlos Lopez-Munoz

Mentor: Haishi Cao

Title: *Understanding the solvation effect for 3-hydroxy-1,8-naphthalimide*

The organic compound 1,8-Naphthalimide is important because of its solvation effect. Its special solvating effects play a role in various chemical processes and applications. The naphthalene backbone together with imide functionalities make 1,8-naphthalene

exhibit intriguing solvation behavior. In a solution the molecule undergoes solvation by surrounding solvent molecules. This causes changes to properties of the molecule, such as its electronic structure and reactivity. The photophysical properties of 1,8-naphthalimide also change during solvation. Fluorescence emission intensity, quantum yield and excitedstate dynamics are influenced by the solvation effect. This makes it a valuable fluorophore that can be used in fields such as fluorescence sensing, bioimaging and materials science. It is essential to understand the solvation properties of 1,8-naphthalimide to tailor to its properties and optimize its performance in various applications. For this research project, 3-hydroxy-1,8-naphthalimide will be synthesized. The solvation effect of it will be investigated in various solvents.

Poster U83 – Jonathan Schardt

Mentor: Kristy Kounovsky-Shafer

Co-Authors: Emily Baxter, Esmeralda Gomez-Mendoza

Title: *Measuring the Mobility of Fluorescently Stained DNA*

YOYO-1 (Oxazole Yellow) is a fluorescence cyanine dye that has been used to stain DNA. The cyanine dyes (YOYO, POPO, BOBO, and TOTO) absorb and fluoresce at different wavelengths. When ds-DNA has YOYO-1 attached to it, a stable fluorescent structure is formed. In previous studies, YOYO-1 stained DNA was incubated at different temperatures and the mobility of the 1 kb DNA ladder was measured. Previous studies have suggested fluorescence intensity increases until the temperature reaches 50°C then decreases. In this study, we aim to test this theory with TOTO, BOBO, and POPO cyanine dyes and compare them to what was seen with YOYO. After analyzing gel pictures and measuring the mobility of individual DNA bands, the effects of these fluorescent dyes can be measured.

Poster U84 – Wryleigh Doyle

Mentor: Mahesh Pattabiraman

Title: *Comparison of Concentration of Carvone and Menthol from different strains of mint*

Carvone is a terpenoid derived from the leaves of *Mentha spicata*, commonly known as spearmint. Peppermint is a hybrid plant of watermint and spearmint. Through the use of simple distillation we extracted the oil from the leaves of multiple samples and analyzed the composition through gas chromatography-mass spectrometry (GC-MS). With this information we are able to provide the group that grows the spearmint and peppermint out of Scottsbluff with valuable information. The purpose of our investigation is to determine which strain contains the highest concentration of

Carvone and Menthol. We have samples spanning three years from 2021-2023 that we are comparing. The work that we are doing in the lab will allow us to provide information to determine the commercial value and yield value of the strains, and determine which strain is more economically efficient to keep growing in the future.

Poster U85 – Bhavya Sharma

Mentor: Mahesh Pattabiraman

Title: *Analysis of Mint Chemical Composition through Distillation*

This project investigates the concentrations of Carvone and Menthol in different strains of mint, specifically focusing on *Mentha spicata* (spearmint) and peppermint, to identify which strain contains the highest concentration of these valuable compounds. Utilizing a combination of simple distillation and gas chromatography-mass spectrometry (GC-MS) techniques, we extracted essential oils from mint leaves collected over a three-year period from 2021 to 2023. The mint samples, sourced from the University of Nebraska-Lincoln (UNL) Scottsbluff campus, were part of an initiative led by Dr. Deepak Santra aimed at experimenting with spearmint and peppermint strains to achieve high crop yields and a rich phytochemical composition. Our experimental procedure involved heating approximately 5g of crushed mint leaves with water to extract the oil, which was then distilled to collect 20ml of mint oil. This oil was transferred to a 2ml vial for detailed chemical composition analysis using GC-MS. The results of this study are intended to provide critical insights into the commercial and yield values of different mint strains, assisting in the determination of the most economically efficient strain for future cultivation. This research offers significant value to local mint growers in Scottsbluff and the broader agricultural community by identifying strains that promise enhanced production efficiency and economic viability. Computer Science plays a crucial role in the statistical analysis of the data collected from the GC-MS (Gas Chromatography-Mass Spectrometry) techniques. We use computational techniques to look at the large datasets that the chromatography process creates in order to find patterns, trends, and statistical significance in the amounts of Carvone and Menthol in various mint strains. These analyses enable us to draw meaningful conclusions about the potency and commercial potential of each strain, aiding in the selection of the most promising candidates for cultivation and further research. Our research is more accurate and more efficient because we use computer tools. This helps make progress in agricultural science and industry.

Physics, Astronomy, & Engineering

Poster U86 – Kim Larbey

Mentor: Joel Berrier

Title: *Investigation of the Evolution of Galaxy Properties*

Through data collected by the Hubble Space Telescope (HST) and James Webb Space Telescopes (JWST), we have been able to view galaxy-galaxy interactions and produce images across the electromagnetic spectrum in order to learn more about how galaxies evolve in shape, color, and other properties. I have examined publicly available galaxy imaging from the JWST in order to make comparisons between galaxies in the early universe and those produced in large scale cosmological simulations. I have taken raw imaging data from JWST to form RGB color composite images by connecting the imaging filter used to the corresponding color. From this data we can investigate early galaxy formation and ascertain properties of those galaxies by looking at their luminosity, color, and morphology. The next step in my research was to make comparisons of simulated galaxy features from the IllustrisTNG simulation to those observed in the early universe to compare the accuracy of the simulation model to those observed in recent JWST data, to characterize the current disparity between observations and existing cosmological models. Currently, we are using SKIRT software in order to create these mock images. Initially, we are starting out by creating low redshift mock images in order to understand the code needed to create the images. Our next step is to apply the knowledge gained from creating these low redshift images and applying that to creating high redshift images. Once these high redshift mock images have been created, our next step will be making comparisons between our simulated mock images and our JWST high redshift images.

Poster U87 – JD Settles

Mentor: Brandon Marshal

Title: *Star Formation due to Radiation Driven Implosion*

I present a study of a region in the galaxy spanning from $l = 114.195^\circ$, $b = 0.434518^\circ$ to $l = 119.322^\circ$, $b = 5.42442^\circ$. This study focused on finding star forming regions caused by radiation driven implosion (RDI). Using a 12CO data cube from the Canadian Galactic Plane Survey (CGPS) and infrared observations from the Wide-field Infrared Survey Explorer (WISE) telescope, I was able to identify three separate 12CO clouds that show signs of RDI. Using geometric approximations, I was able to find the molecular mass of each cloud ranged from $760 M_\odot$ - $2400 M_\odot$. Using the observations from the WISE telescope, I was able to identify a small cluster of young stellar objects

(YSOs) that appear in each cloud. Each cloud exhibited a cometary like structure that compare to theoretical models of RDI. Using reasonable estimates for the distance of to each cloud, I was able to identify possible sources of radiation for each cloud. The sources of radiation were used to determine a theoretical initial condition of each cloud which shows each cloud is located within the theoretical phase space required for RDI to occur. In addition, I used spectral energy distribution (SED) fitting to determine the classification of each YSO. These classifications were able to show a trend of older YSOs being further from the clouds and younger YSOs being nearer to, and within, the clouds.

Poster U88 – Bryce Reeson

Mentor: Adam Jensen

Title: *Habitability of Planets Orbiting Red Dwarf Stars*

Dr. Jensen and I analyzed the habitability of planets orbiting red dwarf stars; specifically, how often solar flares occur in a red dwarf system and the strength of these solar flares. We did this because many other details of red dwarves are already known. We used publicly available data from our sources to estimate the occurrence rate of flares and gather ideas on how to simulate the environment of a red dwarf. We did this by evaluating light curves of red dwarves given in our sources and the graphs provided to determine how often flares occur and at what energies or fluxes. After getting a rough estimate, we coded a Monte Carlo simulation in Python that could simulate the activity of a red dwarf over a universal timescale. These results are important in understanding where life could lie outside our solar system and determining what life could look like in an environment with much more solar activity.

Professional & Applied Studies

Accounting Finance & Economics

Poster U89 – James Flaugh

Mentor: Nam Le

Title: *Sustainable Investments: Understanding the Financial Impact*

The topic I chose for my project was “Building a Sustainable Investment Portfolio”. My goal throughout the project is to identify the core principles that make up a sustainable investment, and how to identify them. I will document my progress by keeping an investment portfolio and recording all of my trades, the total profit and loss, and the thought process behind it. Additionally, I will interview industry professionals and write reflections on what I learn to document what I learn. I will be aiming for a moderate of 2%-5% by the time I present my data and my plan is to achieve this by investing in low risk stocks with steady returns. To determine what I invest in, I will research the stock’s volatility, dividend yield, price/ earning ratio, and growth prospects. In addition to meeting with professionals, I will also read research reports on historical reports that could help indicate what is going on presently with the market. I will also write reflections on these to help document what I learn. My goal is to have well documented research by the time I present along with the data on my investment portfolio. With these I will hopefully be able to complete my goal how identifying what makes up sustainable investments and how to identify them.

Poster U90 – Alexis Bernthal

Mentor: Jody Herchenbach

Title: *Student Investment*

Historically, investing is a favorable strategy to assist with wealth growth over time. Investing is a tactic used simultaneously or in place of money idly sitting in an account. In saying this, maintaining money in a bank account and saving is a smart tactic because investment comes with risk. However, the benefit of investment is the possibility of acquiring more wealth over long periods of time even with economic factors like inflation. The findings of this research are founded on data collection, investment literature reviews, and a personal investment experiment. The research identifies ways individuals, specifically students without Roth IRAs and financial advisors, can get involved in investment. The goal of the research is to provide a

source to aid individuals who want to learn about investment and to make investing less daunting for students.

Communication Disorders

Poster U91 – Melanie Driewer

Mentor: Philip Lai

Co-Authors: Emma Kraft, Megan Forsberg

Title: *Preliminary Findings: Verbal Output Differences in Fathers and Mothers when Interacting with their Child with Autism Spectrum Disorder*

Children with Autism Spectrum Disorder (ASD) have significant impairments in social communication that interfere with their personal and academic skills (Wood-Downie, Wong, Kovshoff, Cortese, & Hadwin, 2021). One of the first signs of atypical development noted by parents of children with ASD is delayed language development and communication (Lazenby et al., 2015). One area that is not well understood is whether certain aspects of communication (i.e., rate of verbal output, rate of gestures, physical contact) of the caretaker play a role in how language is expressed in children with ASD. In this study, we examined gestures, physical contact, and speech output by both the child and the caretaker to observe communicative behaviors during a 15-minute play session. This project specifically investigated verbal output during this social interaction. Preliminary results suggest a difference in how parents communicated with their child. Mothers had greater verbal output than fathers during this dyadic interaction. This resulted in the child with ASD responding to their mothers more than the children who interacted with their fathers. Taken together, a relationship between the child and their parent's communication patterns are emerging. Gestures and physical contact will be examined next, to see if this pattern observed in speech is also reflected in these two other communicative channels.

Poster U92 – Megan Forsberg

Mentor: Philip Lai

Co-Authors: Emma Kraft, Melanie Driewer

Title: *Do Mothers and Fathers Have Similiar Interaction Patterns with their Child with Autism Spectrum Disorder?*

Children with Autism Spectrum Disorder (ASD) have significant impairments in social communication and social interaction. According to the Centers for Disease Control and Prevention (CDC), ASD affects an estimated 1 in 36 children in the United States (Maenner et al., 2023). This disorder is a growing public health concern as ASD occurs

in all ethnic, racial, and socioeconomic groups (Fairthorne, de Klerk, Leonard, Schieve, & Yeargin-Allsopp, 2017). The lifetime total cost of ASD in the U.S. was estimated to be more than 7 trillion dollars in 2019 and is projected to cost 15 trillion dollars by 2029 if the prevalence rate continues to rise (Cakir, Frye, & Walker, 2020). In this study, we aim to determine if the gender of the child the parent is interacting with will produce distinct communicative patterns. As such, the purpose of this study is to explore the linguistic behavior of both fathers and mothers to see if their behaviors differ from one another, and whether their behaviors influence their child's behavior. Preliminary results suggest that the gender of the child did not play a role in how their parents interacted with them during a 15-minute free play task. This potentially can imply that the communication patterns we are observing are largely driven by the family relationship of each pair. Future research will investigate family dynamics observing whether siblings of the child with ASD influences the communication patterns of parents.

Poster U93 – Emma Kraft

Mentor: Philip Lai

Co-Authors: Megan Forsberg, Melanie Driewer

Title: *Variability in Physical Contact during a Free-play Task in Parent and Child with Autism Spectrum Disorder*

The overwhelming majority of parent-child research has involved mothers (Fang, Luo, Boele, Windhorst, van Grieken, & Raat, 2022). Historically, fathers have been underrepresented in research (Davison, Charles, Khandpur, & Nelson, 2017, Lindsay, Valdez, Pineda, & Muñoz, 2021). For example, in pediatric research, 48% of studies on parenting and child psychopathology included only mothers. In contrast, studies with data from only fathers came in at 1% (Phares, Lopez, Fields, Kamboukos, & Duhig, 2005). Interest in fathers as active parents has increased in recent years with considerable attention given to father involvement in direct child-rearing activities (Brown, McBride, Shin, & Bost, 2007). Gestures, physical contact, and speech output by both the child and the caretaker was investigated during a 15-minute play session. For this project, physical contact was researched between the parent and the child with ASD. Physical contact can be used as a communicative channel, especially when children are minimally verbal (Hazen & Black, 1989). Preliminary results suggest no real difference in physical contact between fathers playing with their child as compared to mothers interacting with their child. The variability in the data suggest that physical contact was largely driven by the dynamics of the parent-child pair. Taken together, the results suggest that communication can be displayed in different way. Future research will explore if families with large amounts of physical contact, would there also be

greater amounts of gestures and verbal output compared to families with fewer instances of physical contact.

Poster U94 – Kinley Helmer

Mentor: Ladan Ghazi Saidi

Title: *Exercise as an Intervention for Cognitive Health in Older Adults*

As humans progress in their lives, so does the risk of cognitive deterioration and dementia in the older population (Lam, 2011). With no immediate treatments for AD, researchers and scientists must resort to alternative interventions (Nagamatsu, 2013). It has been found that integrating forms of physical activity have profound improvements in neurocognitive functioning in older adults (Scherder, 2005). Aerobic exercises have proven to be most effective but the most problematic. As humans age, muscle strength, flexibility, agility, and endurance decrease, stressing the importance of researching a less strenuous physical activity or anaerobic exercise (stretching and toning) (Anderson-Hanley, 2010).

I first found a search engine that was reliable, Google Scholar. I used keywords to narrow my search: stretching/toning, mild cognitive impairment, subject memory complaint, older generation, and cognitive health. Before I clicked on the suggested articles, I scanned over the keywords and if one looked promising, I read its abstract. If the abstract was relevant to our study, I went more in depth and picked out the valuable information. To organize all the studies, I created a table with the information and color-coded it.

As a result of stretching/toning, I found that there have been improvements in cognitive screenings and measurements, VO₂, and executive functioning (Lam, 2011). Some of the cognitive screenings and measurements included the CMMSE, ADAS-Cog, delayed recall, Chinese trial A test, CVFT and subjective cognitive complaints (McEwen, 2018). With a higher VO₂ one can produce more energy allowing improvements in memory, attention, and executive function. For executive functioning the participant will have more control and coordination over their cognitive abilities and behaviors.

Although anaerobic exercise positively impacts cognitive health in the older generation, there is still much of the field to uncover. Our ongoing project will test how stretching/toning affects adults ranging from 60-80.

Poster U95 – Noelle Abels

Mentor: Ladan Ghazi Saidi

Title: *The Effects of Language Learning vs Reading in mother tongue on Cognition in Older Adults: A Pilot Study*

As the population continues to live longer, individuals face more health issues presented in the aging population than ever before. One of these issues that many older adults face is mild cognitive impairment which can progress to dementia and Alzheimer's in case of a pathology. As there are no well-established pharmaceutical treatments, we must look to alternative solutions as treatment and prevention options for those experiencing cognitive decline. In my research, I examined the literature for previously performed experiments involving cognitive activities and reading as a prevention method for cognitive decline at aging. I used Google Scholar and the UNK databases to find these experiments. I used keywords including: cognitive impairment, cognitive decline, MCI (Mild cognitive impairment), mild dementia, SMC (Subjective memory complaints), older adults, aging population, senior adult, and reading intervention. The experiments were then sorted and labeled depending on the activity, whether or not participants had been diagnosed with MCI, how measurements of change were performed, and the length of the study. The results show that studies that used cognitive activities as prevention and studies that focused solely on reading as a prevention method found that participants experienced less of a decline in cognitive capabilities. Similarly, both tests that used behavioral measurements and tests that used structural imaging found decreased cognitive decline in participants who used a prevention method. Studies also found these results to happen within a short period, working with as little as 3 weeks. These studies allude to reading working as a prevention for cognitive decline, but we would like to do further research to determine details. Our research will examine adults aged 60-80 and compare the structural imaging of their brain, via fMRI, before and after six months of regularly reading newspapers on a tablet, smartphone, or computer. This is an ongoing study.

Cyber Systems

Poster U96– Noah Meyer

Mentor: Adam Spanier

Title: *Lloyd the Monkey 3: Judgement Day*

Student project development is an upward trend that is both captivating and informative to keep an eye on, especially in the creative and technical fields. These projects, especially in succession, can represent an unfiltered look into the student's

philosophy and worldview as they hone their craft and produce increasingly incredible results. One example is the Lloyd the Monkey series, which was created throughout its developer's time at the University of Nebraska. These platforming games show growth in software engineering, 2D animation and game design, and have a small fanbase on the larger Internet.

Set for release later this year is Lloyd the Monkey 3: Judgement Day, the final installment of the Lloyd series, and the last game to come out of its developer as a college student. This game features experimental 2D platforming, enhanced animation techniques and programming techniques that put the game leagues above its predecessors.

For this year's Research Week event, the presentation on Lloyd the Monkey 3: Judgement Day will focus on the underlying software engineering techniques and improvements in the visual and game design. A sample build of the game will also be available for attendees to play and critique ahead of the full release.

Family Sciences

Poster U97 – Lateefat Alimi

Mentor: Sharon Obasi

Title: *Cyberpsychology Digital Identity and Online Behaviour*

Cyberpsychology, defined as the study of psychological processes underlying technologically interconnected human behavior includes multiple disciplines such as human-computer interaction, computer science, engineering, and psychology. As individuals increasingly engage with the world through cyber technology in many areas of their lives, research on online behavior has also increased exploring several topics including how people behave in cyberspace relative to face-to-face, social media preferences and use, online , cybersecurity measures, and online bullying. Digital identity includes both real and fictitious personas constructed in digital spaces, influencing how individuals interact and engage online. Studies reveal that excessive social media use correlates with heightened levels of depression and anxiety, particularly among young users. Studies show that active young users who spend more than 2 hours on social media are more likely to complain of mental health, including psychological disorders: anxiety and depression. This review examines the interaction between digital identity and online behavior to identify high impact practices supporting the ethical and responsible use of technology. Embracing the principles of cyberpsychology can lead to a more informed and balanced approach to navigating the digital world promoting healthier online environments and well-being for individuals.

Industrial Technology

Poster U98 – Arlet Nava

Mentor: Dana Vaux

Title: *Impact Of Color & Light for those with Alzheimer's Disease*

The intricate relationship between color theory and its potential impact on humans can influence patients with Alzheimer's disease. While color theory is not a cure for Alzheimer's, it holds promise in creating therapeutic and calming environments for both patients and their families navigating the challenges of this debilitating disease. Through the lens of color theory, this study explores an approach to improving the quality of life for Alzheimer's patients by focusing on the design and aesthetics of their living spaces. Alzheimer's disease poses a significant burden on individuals and their families, impacting cognitive functions and leading to emotional distress. The existing research explores the profound effects of Alzheimer's on individuals, recognizing it as a nerve-racking condition. Recognizing the limitations of current medical treatments, researchers have found potential benefits of integrating color theory into the environments where Alzheimer's patients reside. The method for this study is a qualitative analysis cross referencing common things found in the literature. Two matrices were created cross referencing wayfinding, cues, attention, conditions, and outcomes with color and emotional response in Alzheimer's patients to find the relationship between these themes. Color-coded cues improve Alzheimer's patients' ability to navigate complex spaces, potentially offering a practical solution for addressing wayfinding challenges in individuals with cognitive impairments. Alzheimer's patients demonstrated equal efficiency in using a color cue to selectively search for relevant items in an array. Emotional responses during light therapy emphasized the need to create a more supportive and mood-enhancing environment for those suffering from Alzheimer's disease. While color theory does not provide a direct cure, it has the potential to contribute to the creation of spaces that are not only aesthetically pleasing but also therapeutic.

Poster U99 – Elina Vosoughi

Mentor: Dana Vaux

Title: *Office Space Designs: How does an interior office design impact stress and anxiety?*

Context: A well-designed interior design space can play a big role in reducing stress and anxiety when the space is designed to be comforting and relaxing. On the other hand, a poorly designed space can be overwhelming for people, especially in a public space in which they have no control.

Method: This research used photo sorting as a data collection method. Photos of 20 office spaces were presented to 20 individuals both male and female between the ages of 20-60. The participants sorted the office/work space images based on their opinions, past personal experiences, and preferences. They were asked to determine whether or not they would want to work in spaces similar to the photos given to them. They started by sorting these photos of office spaces by saying “yes” or “no”. Next, they were asked to briefly explain why they said they would work in the spaces they said they would, and again explain why they would not want to work in the spaces of photos they sorted “no”.

Findings: The top five photos with positive responses were ranked as 19 out of 20, 17 out of 20, 16 out of 20, 15 out 20, and 13 out of 20 which added up to 95%, 85%, 80%, 75%, and 65%. All of these had in common was natural light, good electric lighting sources, windows, openness and spaciousness, a more modern and higher end aesthetic, and biophilic aspects including plants, greenery, flowers, and natural elements. On the other hand, the top five with negative responses were all ranked as 20 out of 20 which shows that 100% of participants ranked them as “no” they would not want to work in that office. What these photos all had in common was cluttered design, limited space, no or limited windows, limited lighting, and darker designs with no biophilic elements.

Advancement of Design Knowledge: These findings show that positive design factors that impact users include: natural sunlight, open floor plan/spaciousness, biophilic design elements, plants and flowers, natural design elements, and pleasant color combinations. Negative design factors that impact users are no natural light, bad lighting, too dark, cluttered space, no personal space, and wrong color and pattern combinations. This is very useful for designers wanting to create a new office space, in order to not recreate office design mistakes that would negatively impact workers who will be the one’s using the space.

Poster U100 – Dayana Hernandez

Mentor: Dana Vaux

Title: *Exploring the influence of interior design elements on consumer behavior and shopping habits in retail environments*

This research is vital for design; it connects the aesthetics of design with real-world functionality. It enables designers to craft more effective and innovative retail spaces by understanding how design influences customer behavior and satisfaction.

There isn't enough research on how interior designer elements affect customer experience in retail stores. Without this information, retailers might miss out on the benefits of good store design, which negatively impacts their earnings. (Omar 2022).

The study for this research was primarily conducted with interviews. There was a total of 6 questions each under different category – circulation and display, store comparison, flooring design, lighting design, personal design, and the overall influence of interior design in the participants daily life. A case study of two retail spaces was observed to determine first-hand the design elements of big box stores versus small businesses/specialty shops.

Findings show that interior design elements play a big role in customer satisfaction, it also plays a role in their choice to either enter a store or prefer another one just by the visual of the store. Customers do pay attention to the details of a store and appreciate good aesthetics. Flooring design, ceiling, color selection – all these elements influence customers. However, the most important element that affected customers was lighting design. From all the sides of the age spectrum, all like bright lighting. It was also noticed that bold selections for flooring design, ceiling, color selection can cause negative reactions. Simple and natural design elements provide a more balanced effect.

Findings offer insights into optimizing customer experience and satisfaction within retail spaces through considerations and categories such as store layout, lighting, and overall ambiance. Also, these findings can be extended to inform design decisions in other industries, including hospitality, healthcare, and office environments, where creating inviting and functional spaces is essential for promoting user satisfaction and well-being.

Poster U101 – Grace Goodwin

Mentor: Dana Vaux

Title: *Interior and Product Design Senior Project*

Tourism is a vastly growing industry, therefore understanding how designers make an impact on one's stay. The purpose of this study is to show how the built environment affects tourism and how those effects impact individuals physical and psychological behavior while traveling. Overall customer experience in travel, and "design for the travel industry starts with understanding customer expectations" (Dias, 2019). This then leads to the need for "evolving consumer expectations into a set of practical guidelines to inform and empower industry" (Lalicic, 2021). Qualitative and quantitative design research were used in this study to decide if location and aesthetics affect one's physical and psychological behavior when choosing a destination to travel to. The survey included topics such as travel aesthetics, cuisine, and location ambiance. After collecting that data, more specific questions about the travel history of six individuals were conducted. Findings show that location makes an impact on tourism. Aside from location, atmosphere and ambiance is what drives most people's decisions in booking a trip. Culture, cuisine, and history also play a role in where people choose to vacation. From hotels, to spa's, to Airbnb hot spots, tourism is expanding. The way buildings work and how designers incorporate their knowledge is key in good design, especially for when an individual is away from their everyday life.

Poster U102 – Courtney Swisher

Mentor: Dana Vaux

Title: *How the Interior Design of West Center Affects Human Behavior*

The purpose of this study is to further the understanding and connectivity between interior design attributes and behavior patterns of students in relation to West Center's study lounges. Studies have shown that there is a connection between human behavior and the stimulants in the built environment (Jarett, 2006). Also, specific design elements have been shown to impact and gathering spaces and place attachment for new and returning occupants (Waxman, 2006). The methodology behind this study includes quantitative and qualitative observations and behavioral mapping techniques. The researcher conducted two series of observations in two different locations within West Center. Each location was observed for ten days, once in the morning and once in the afternoon, during the weekdays of the 2023 fall semester. After the observations concluded, the data collected was converted into a map depicting circulation, occupant activities, and behavior patterns amongst users of the spaces during the observational period. The data gathered has emphasized the importance of student engagement to increase place awareness and interaction.

Findings reveal concepts that could be implemented to improve overall social space quality could be more seating and varied seating options, providing more opportunities for interactive activities, such as controllable music options and television programs, as well as adjusting coffee shop availability hours.

Poster U103 – Ryann Lewis

Mentor: Dana Vaux

Title: *Inclusivity in Design*

The purpose of this study was to show how and why implementing universal design elements into residential spaces can benefit those individuals who are Neurodivergent by providing routine, structure, and cognitive function. Designers have the capability to make environments usable to all people. Often overlooked is making things easier and friendlier to all people in residential design. Designers can implement universal design elements into residential spaces to create spaces that will benefit everyone, but specifically those Neurodivergent individuals. This qualitative study included questionnaires and interviews with special education teachers and Neurodivergent individuals, along with their caregivers and families. The researcher narrowed down the most relevant universal design elements that benefit those individuals through the questionnaire and based the interviews on that data. This was to determine what design elements that work well in school settings that can also be implemented into a residential or home. The data was then compared with the definition of each universal design element to determine the primary aspects to pull from each element for implementation in residential settings. Four universal design elements emerged as most beneficial for cognitive growth, structure and some sort of routine. These elements were wayfinding, acoustics, lighting, and the addition of greenery in spaces. These interviews bridged the gap of what was missing in residential spaces to continue cognitive growth even while at home, that was found through initial research. The universal design elements that were already implemented in schools were not being implemented into spaces where the individuals go to relax or live. These findings are extremely valuable to designers and families when creating spaces for neurodivergent individuals. Utilizing the identified universal design elements in a residential space can have continuous and long-lasting effects on cognitive function for neurodivergent individuals through structure for those who depend on it the most.

Poster U104 – Bre Bartak

Mentor: Dana Vaux

Title: *Social Dynamics and Well-being of the Aging Population*

Studies tell us third places provide basic consumer needs, a gathering place for people to meet and interact, along with a place that safely satisfies people's personal and emotional needs. The goal of this study is to understand how to create a space that best fits the elderly community. We wished those who passed had an outlet where they could escape their house and go connect with people. A survey was sent out using the snowball method to individuals who then passed it onto their parents or grandparents. Then printed surveys were distributed to residents of two assisted living facilities in Kearney, Nebraska. This also allowed a chance for the researcher to view the physical environment where the residents are staying. The survey was made up of 9 questions. The first seven questions were geared toward companionship and emotional support. The last two questions were a multi-select question asking about preferred social activities. All the questions were multiple choice with detailed answers. Results from the survey showed a significant difference between the two assisted living facilities. The data on social connectedness from the first assisted care facility were significantly higher than the second assisted center. The residents are active and attend outside activities with others weekly. They had a reasonable support system or social network in place, encompassing a broad spectrum of interests and abilities. The second assisted living facility was much different. The results were significantly lower. The outcomes from this study can be applied to creating the best environment for the aging population. Creating places that implement activities that the elderly enjoy. Designers can use this information to create facilities or activity centers tailored for the aging population. Designers can also build on this information to design assisted care facilities.

Poster U105 – Janet Spengler

Mentor: Dana Vaux

Title: *The Relationship Between Health, Nature, and Physical Design Elements*

This study explores how physical design elements, health, and nature are related. Designers can use design elements to create built environments that promote human health. Neglecting human health in designs can lead to negative mental health outcomes (Amerio et al., 2020). Collaborating between psychological and sociological research and design is essential (Jarrett, 2006). Alexander (1997) offers a set of "patterns" for designing that meet the needs of residents. This study compared literature on health, nature, and physical design elements. It was created by comparing restorative biophilic aspects with Alexander's A Pattern Language. Using logical

argumentation, a framework was created that examined factors. The goal was to find the relationships between the factors (Wang, 2007). Any pattern that did not align with at least three articles from one area of the literature or did not align with both groups at least once was discarded from the argument. The patterns that aligned included #171 – Tree Places, #172 – Garden Growing Wild, #173 – Garden Wall, #161 – Sunny Place, #164 – Street Windows, #128 – Indoor Sunlight, #252 – Pools of Light, and #180 – Window place. Based on the logical argument matrix, research on health, nature, and physical design share similar suggestions for improving human health. When health professionals and designers work together and recognize each other's roles in designing the built environment, they can collaborate effectively to improve human health by incorporating connections between nature and physical design elements. This study aimed to demonstrate the relationship between health and nature with physical design elements and helps to understand how the three are interconnected and can be utilized when designing for human health and wellbeing.

Poster U106 – Sara McEvoy

Mentor: Dana Vaux

Title: *Company Branding: How Can Values Reflect in the Interior Space?*

Company branding plays a role in office design, and can promote a collaborative company culture and positive work-life balance for employees. Current literature on branding, working from home, and work-life balance has shown that a company's brand, now more than ever, is very important in drawing in and keeping employees. Additionally, the literature displayed a surge in employee satisfaction with working from home. However, there was a lowered sense of work-life balance when working from home. A mixed qualitative study utilized survey distribution, spatial analysis of offices, and case studies of historical precedents of office design. Surveys were distributed via text and email to several participants that worked in an office of some sort. Corporate offices were visited and branding elements were analyzed. Finally, literature was reviewed on successful versus unsuccessful office design strategies. Findings show that employees are aware of their company's values. They are watching to see if their employers are holding true to their values. Also, employees are generally satisfied with working from home, and they would do it more if they could. However, employees felt that their employers didn't promote working from home. It was also found that employee productivity and communication with co-workers decreased when working from home. These findings make a case for why office design needs to be an intentional process that delves into the internal workings of a company. Employees are aware of their company's brand, and it's important to incorporate the brand in ways beyond colors and logos. The findings also show the importance of designers in

carrying out an employer's branding. Getting to know a client's values when working with them is important so that you can tailor their spatial needs to reflect their brand and values.

Poster U107 – Addyson Little

Mentor: Dana Vaux

Title: *The impact of the built environment on individual's productivity and mood*

The purpose of this study was to explore connections between physical spaces and how that affects people's productivity and mood. People are affected by the things that surround them in multiple ways. There is a clear connection between how people act and feel and the interior of a space. There are also key connections between memories and physical aspects that affect people's mood. Mood and productivity are interlinked; if people are upset or emotional they can not think straight which affects how productive they are. This research included both a quantitative survey and a qualitative interview to find the outcomes on how the built environment affects people's productivity and mood. The survey was sent out using the snowball method, where it was sent to people and those individuals continue to send it to others. The survey consisted of 12 questions that were both multiple choice and short answer. The interviews were conducted through individual phone calls with individuals who said they were available through the survey. From the survey and interviews, findings show key connections between physical aspects in a space and people's productivity and mood. Outcomes of the survey and the interviews showed prominent connections between physical elements that made people happy and the space they consider as their most productive space. For example, individuals mentioned that coffee, friends, and music contributed to happy feelings in the space they felt most productive was in a coffee shop. Similar connections happened within each space that was mentioned. This research shows that when designing spaces, it is vital to look at how the space affects the people that are using it. If people do not feel comfortable or happy in a space, they will not use that space for productivity.

Kinesiology and Sports Sciences

Poster U108– Piper Steinman

Mentor: Gregory Brown

Co-author: Paige Steinman

Title: *Sex-Based Differences in Swimming Performance in Age 10-and-Under Swimmers in Short Course Regional Competition*

BACKGROUND. The topic regarding the division of youth sports based on sex continues to be of discussion and argument. There is little research regarding prepubertal sex-based differences in competitive youth swimming to support or refute such arguments.

PURPOSE. The purpose of this project was to determine whether or not sex-based differences exist in male and female competitive youth swimmers in short course (yards) events.

METHODS. The top eight performances for male and female swimmers from the USA Swimming Eastern Zone Short Course Age Group Championship for the previous 10 years for the 10-and-under age group were analyzed for sex-based differences.

RESULTS. For the short course (yards) events, the male swimmers were observed as having been faster ($P < 0.05$; Cohen's d 0.308-0.638) than the female swimmers in the 50y freestyle, 100y freestyle, 200y freestyle, 500y freestyle, 50y butterfly, and 100y butterfly. In the 50y backstroke, 100y backstroke, 50y backstroke, 100y backstroke, 100y IM, and 200 IM, no differences were observed between males and females. In no short course events were females significantly faster than males.

CONCLUSION. Although the present data indicates that the presence or absence of sex-based advantages in male swimmers in the 10-and-under age group does, in fact, vary based on factors such as course and event, the absence of sex-based advantages in females in any event is of increased deliberation in the argument regarding division of youth sports based on sex.

Poster U109– Paige Steinman

Mentor: Gregory Brown

Co-author: Piper Steinman

Title: *Sex-Based Differences in Swimming Performance in Age 10-and-Under Swimmers in Long Course Regional Competition*

BACKGROUND. The need for sex-specific youth sports is a topic of ongoing debate. However, there has been minimal evaluation of prepubertal sex-based differences in competitive youth swimming to help inform this debate.

PURPOSE. The purpose of this project was to determine whether sex-based differences exist between male and female competitive youth swimmers in long course (yards) events.

METHODS. The top eight performances for males and females from the USA Swimming Eastern Zone Long Course Age Group Championship and Short Course Age Group Championship for the previous ten years for the 10-and-under age group were analyzed for any sex-based differences.

RESULTS. For the long course (meters) events the males were observed as having been faster ($P < 0.05$; Cohen's d 0.336-0.473) than the females in the 50m freestyle, 100m freestyle, 200m freestyle, 400m freestyle, 50m backstroke, 100m backstroke, and 100m butterfly. There were no differences observed between males and females in the 50m breaststroke, 100m breaststroke, 50m butterfly, or 200m individual medley (IM). There were no events for long course events in which the females were significantly faster than the males.

CONCLUSION. Although the present data indicates that the presence or absence of male sex-based advantages in swimming in the 10-and-under age group vary based on course and event, the lack of female sex-based advantages in any event is an important consideration in the ongoing discussion regarding the necessity for sex segregated youth sports.

Poster U110– Bridgett Jensen

Mentor: Elena Robinson

Co-author: Elena Robinson

Title: *The Self-Efficacy of Athletic Trainers in Pre-Participation Cardiac Risk Assessment for Athletes*

Context: There are several risks associated with participating in sports, such as underlying cardiac issues, that can result in sudden cardiac death. By way of current

programmatic and certification standards, Athletic Trainers (ATs) should understand how to screen for cardiac issues during pre-participation exams (PPEs). PPEs are built to include a cardiac section with cardiac history questions and a physical examination. Due to the difficulties of detecting cardiac issues, ATs must have high self-efficacy when performing appropriate screening techniques. However, no researchers have examined ATs' self-efficacy in pre-participation cardiac assessment. The objectives of this study are twofold. The first objective is to develop and validate a scale that assesses ATs' self-efficacy of cardiac risk assessment. The second objective is to examine the self-efficacy of ATs in performing cardiac assessment.

Methods: A cross-sectional research design will be used for this study. Using self-efficacy theory as the conceptual framework, the 6-item Athletic Trainers' Self-Efficacy in Cardiac Risk Assessment for Athletes Scale (ATSECRAA) was developed. Face validity will be established by an expert panel of ATs, psychologists, and sports medicine physicians. The panel will be instructed to evaluate the questionnaire and determine if the questions and scales are applicable, clear, understandable, and administered properly. Once face validity is established, the survey will be placed in Qualtrics (Provo, UT) and will include demographic questions on experience, job setting, and education. Certified and active AT members will be invited from the National Athletic Trainers' Association survey service tool to complete the questionnaire. The survey will remain open for 6-weeks with a reminder email sent biweekly. The survey data will be used to assess reliability first. Once reliability is established, the assessment of self-efficacy of ATs can be performed, along with comparisons self-efficacy results among ATs of different years of experience, educational background, and job settings.

Poster U111– Michelle Koenig

Mentor: Kazuma Akehi

Title: *The Effects Ashwagandha Supplementation Has on Quadriceps Muscle Strength in Physically Active Males*

Background: Ashwagandha (also known as *Withania Somnifera*) is an evergreen shrub native to Asia and Africa. Several scholarly articles address the health advantages of ashwagandha, including alleviating symptoms of depression, anxiety, and insomnia. Additionally, research has demonstrated that it can enhance the size and strength of muscles, and it may complement a resistance training regimen. However, the literature is limited on sports and athletic performance, particularly muscle strength.

Purpose: The purpose of the study is to examine the effect of 8 weeks of Ashwagandha supplementation on quadriceps muscle strength. The hypothesis was to

see a significant improvement in quadriceps muscle strength in the Ashwagandha supplementation group compared to the placebo group.

Methods: Twelve recreationally active male subjects (19-25 years) will undergo eight weeks of ashwagandha supplementation (500 mg) or placebo (general vitamin supplementation) while performing a standardized lower-body exercise prescription such as back squats, leg extensions, goblet squats, and leg press at 75% of their 1-RM with an exercise volume of 3 sets of 8-10 reps twice a week. An isokinetic dynamometer will be performed to measure the quadriceps' muscular strength at the start and finish of the eight weeks.

Practical Application: Ashwagandha supplementation is a growing trend in the performance industry. However, most of the literature was tested and published in Asia, and there needs to be more research on muscle strength to practice it safely.

Poster U112– Alex Korte

Mentor: Gregory Brown

Co-author: Isaac Haselhorst

Title: *Effects of Caffeine on Blood Lactate, Heart Rate, and Calisthenic Exercise to Fatigue in College-Aged Men*

Background. Caffeine is commonly used as an ergogenic aid to reduce fatigue and enhance physical performance. Caffeine exerts ergogenic effects in a dose-dependent manner, with lower doses (~3 mg caffeine/kg body weight) enhancing aerobic exercise performance but larger doses (~5 mg/kg) being necessary to enhance resistance exercise performance. Furthermore, caffeine may have different effects on the upper body compared to lower body exercises.

Methods. 10 male students currently enrolled at UNK will be assessed for body composition utilizing an InBody bioelectrical impedance analysis (BIA) device, aerobic fitness through a YMCA submaximal bicycle test, lower-body power through a vertical jump test, and upper body strength and endurance using a timed one-minute pushup test. After the initial fitness testing, using a double-blind cross-over experimental design, participants will ingest either 400 mg of caffeine or a placebo, rest for one hour to allow for blood caffeine concentrations to peak, and then engage in a burpee test which includes two sets of ten burpees as a warm-up and a third set of burpees until fatigue. One week later, the burpee testing will be repeated with each participant receiving the other pill. Participants will be instructed to record their diet during the 24 hours before the initial burpee test and then follow the same diet before the second burpee test to minimize its impact on their performance. To observe the effects of caffeine, the time needed to complete each set of burpees, the number of burpees

completed during the final set, heart rate during the burpee testing, and the changes in blood lactate concentration from before the first set of burpees to after the final set of burpees will be compared.

Poster U113– Isaac Haselhorst

Mentor: Gregory Brown

Co-author: Alex Korte

Title: *Effects of Caffeine on Blood Lactate, Heart Rate, and Calisthenic Exercise to Fatigue in College-Aged Women*

Background. Caffeine is commonly used as an ergogenic aid to reduce fatigue and enhance physical performance. Caffeine exerts ergogenic effects in a dose-dependent manner, with lower doses (~3 mg caffeine/kg body weight) enhancing aerobic exercise performance but larger doses (~5 mg/kg) being necessary to enhance resistance exercise performance. Furthermore, caffeine may have different effects on the upper body compared to lower body exercises.

Methods. 10 female students currently enrolled at UNK will be assessed for body composition utilizing an InBody bioelectrical impedance analysis (BIA) device, aerobic fitness through a YMCA submaximal bicycle test, lower-body power through a vertical jump test, and upper body strength and endurance using a timed one-minute pushup test. After the initial fitness testing, using a double-blind cross-over experimental design, participants will ingest either 400 mg of caffeine or a placebo, rest for one hour to allow for blood caffeine concentrations to peak, and then engage in a burpee test which includes two sets of ten burpees as a warm-up and a third set of burpees until fatigue. One week later, the burpee testing will be repeated with each participant receiving the other pill. Participants will be instructed to record their diet during the 24 hours before the initial burpee test and then follow the same diet before the second burpee test to minimize its impact on their performance. To observe the effects of caffeine, the time needed to complete each set of burpees, the number of burpees completed during the final set, heart rate during the burpee testing, and the changes in blood lactate concentration from before the first set of burpees to after the final set of burpees will be compared.

Poster U114– Gracyn Jozsa

Mentor: Nick Lamoureux

Title: *Links Between Physical Activity and Symptoms and Management of Anxiety*

Introduction: Anxiety has become one of the most common and talked about mental health concerns, with increased rates since the COVID-19 pandemic. There are many available treatment options, oftentimes found in costly medical prescriptions. Physical activity has been found to be beneficial in the management of depression and depressive symptoms, and similar effects for the management of anxiety are possible. Method: A scoping review of the links between physical activity and anxiety management was conducted. Particular attention was paid to general relationships between physical activity and anxiety, dose response relationships, and the impact of intensity and specific activities on the relationship. Discussion: It has been shown that people with high physical activity levels are 26% less likely to develop anxiety compared to people with low physical activity levels. Physical activity has also been shown to improve symptoms among individuals with anxiety disorder diagnoses.. A U- or J-shaped association between physical activity and anxiety symptoms was identified, suggesting an optimal dose of between 600 and 6000 MET min/wk (i.e., 2.5-23 hours of moderate intensity walking per week). The relationship between anxiety and leisure-time physical activity consistently shows beneficial effects, while associations between anxiety and transportation physical activity are inconsistent, and occupational physical activity is associated with increased rates of anxiety. No relationship was found between specific activities and anxiety related outcomes. Further research is needed to determine the role of specific activities on reducing anxiety, and whether gender differences impact these relationships.

Poster U115– Cady Young

Mentor: Elena Robinson

Title: *Physical Therapists Perceptions of Youth Athlete Sport Specialization*

Context: Specialization of sports in youth athletes is a controversial topic in sports and sports medicine communities. The attitudes and perceptions of sport specialization with coaches, parents and athletes have been examined and results have led to varying perceptions and knowledge of specialization and its influence of athletes' development, injury risk, overall experiences and well-being. When it comes to healthcare providers, however, very little research has been completed on assessing their perceptions, knowledge, and overall support of sport specialization. The health care field of physical therapy is one profession that commonly works with youth athletes and should be thoroughly assessed for its perceptions of sport specialization.

This study's objective is to examine the perceptions of sport specialization of physical therapists (PTs) within Nebraska.

Methods: The study will consist of a survey that will be sent out to all licensed PTs in Nebraska who have experience in providing care within pediatric populations. Subject email addresses will be purchased through an accessible list from the Nebraska Department of Health and Human Services. Email addresses will be placed in Qualtrics, and an initial email will invite the subject to complete the questionnaire. The email will provide the subjects with information regarding the details of the study and request consent before continuing the survey. This survey will consist of a demographics section and a sport specialization section, totaling 9 items. The questions about sport specialization perceptions will be taken from a previously validated tool used to assess awareness of various sport specialization recommendations among youth sport parents and coaches. Once the study is complete, the results will be used to note trends in perceptions along with years of experience, pediatric specializations, and rural versus non-rural areas of practice in Nebraska.

Poster U116– Karley Bennett

Mentor: Bryce Abbey

Title: *Hydration and Electrolytes: Exploring Collegiate Athletes Knowledge, Attitudes, and Behaviors*

Background: This research project focuses on gaining an understanding of the thoughts, understandings, and actions of collegiate athletes regarding hydration. Recognizing the vital role proper hydration plays in performance and health, the study addresses the existing gap in knowledge, attitudes, and behaviors related to hydration among collegiate athletes. Looking at the need for more information, the research aims to uncover athletes' awareness of hydration, their perception of its importance, and their adherence to good hydration practices. Referencing the potential performance detriments resulting from inadequate rehydration, the study proposes a survey to investigate collegiate athletes' knowledge, attitudes, and behaviors surrounding hydration. By gathering this data, the research seeks to shed light on current hydration practices, offering insights and identifying areas for enhancement among college athletes.

Purpose: The purpose of this research is to investigate the knowledge, attitudes, and behaviors of collegiate athletes regarding proper hydration. Method: A survey was created to “determine what collegiate athletes know about hydration, how they feel about what they know, and how they behave in regard to staying hydrated,” (Trammell,

Jeffie). The survey was sent to approximately 500 participants from the University of Nebraska at Kearney (UNK) athletic teams. These potential participants included both male and female collegiate athletes aged 19 or older, spanning all class ranks from freshmen to graduate students. Participants for the study must be a member of a UNK athletic team. The voluntary survey was distributed through the UNK Athletic Department via students' email accounts. The survey required approximately 5-10 minutes to complete. Data was collected using the Qualtrics survey platform. Results: Data is currently being collected and analyzed.

Poster U117– Hannah Harrison

Mentor: Kaiti George

Title: *Loper Nutrition Cookbook*

Before last year, there existed a lack of a platform in which Kaiti George could display her sports nutrition recipes and resources. Research had to be conducted to discover website options to display the recipes, as well as develop a format that could be used to showcase each recipe. Food photography and editing photos require researching optimal lighting and angles to make the food most appealing. Further research must be done to evaluate optimal avenues to make recipes and resources visually appealing and usable for all students and student-athletes.

Poster U118– Davin Helmer

Mentor: Shannon Mulhearn

Title: *Rock wall use and perceptions at UNK*

Indoor Rockwall climbing falls into the category of adventure or adrenalin sports. Previous research about indoor Rockwall use has focused on physical gains but has not considered perceptions of fear. The purpose of this cross-sectional survey study was to learn about the perceptions of UNK students related to fear and rock wall use. Students were recruited during lunch at busy locations on campus. Participants accessed the questionnaire through a QR code. Questions asked what college they were in, if their previous schooling had rock wall access, whether they had used the campus wellness center, the rock wall, and their perceptions of fear related to climbing. If they had accessed the wall, they also self-reported skill level. Ninety-two students completed the survey. Entries were removed if completion was below 80% (n=7), and those under 19 years old (n=3), resulting in 82 responses representing College of Arts and Sciences (56.1%), College of Business and Technology (18.3%), and College of Education (25.6%). Fifty-four participants had used the wellness center and only 30 had tried the rock wall. Overall, 73.1% viewed the rock wall as just a little to not at all

scary, while 26.8% answered it was somewhat to very scary. However, differences were observed between the groups. Perceptions of fear were higher in those who never used it ($M=2.96$) as compared to those who had ($M=3.33$). With a higher perception of fear reported in those who had never climbed, it is reasonable to believe that fear may be a barrier to students' willingness to try it for the first time. In the next phase of this study, the team aims to look at physiological responses in students who try the wall for the first time.

Poster U119– Kelsey Cordes

Mentor: Nick Lamoureux

Title: *Dietary Knowledge and Preferred Healthy Eating Support Strategies Among College Students*

Introduction Breakfast habits are positively correlated with academic performance, cognitive engagement, and overall diet quality, however many college students neglect breakfast due to personal and environmental factors. Numerous strategies have been shown to be broadly effective, however determining barriers that a population is facing and the strategies they are willing to engage with is key in the development of effective interventions. This study explores current nutritional habits among college students, the role of nutritional knowledge in these habits, and the perceived usefulness of strategies designed to improve their dietary habits.

Methods Students at the University of Nebraska at Kearney completed an anonymous online survey comprised of three sections: demographics, nutritional knowledge, and breakfast behaviors. Correlations were used to evaluate the impact of nutritional knowledge on dietary habits, and the usefulness of behavior change techniques were ranked on a scale of 1 to 5 with 5 being the most beneficial.

Results 118 complete responses were submitted (69% female). Those who report frequently eating breakfast typically eat fruit, eggs (various forms), toast/bagels, and yogurt. Dietary knowledge was not associated with breakfast frequency ($r=0.08$), or with breakfast habits ($r=0.00-0.14$). Lack of appetite, time conflicts, and a lack of dietary accommodations on campus (e.g., allergies) were the most common barriers reported. Having grab and go food (mean score 4.1 ± 1.1), waking up earlier (3.9 ± 1.3), and having a variety of things to eat in the morning (3.6 ± 1.4) were perceived as the most useful support strategies.

Conclusion Nutritional knowledge was not associated with frequency of breakfast or breakfast habits. Those who are interested in changing their breakfast habits reported that having a variety of convenient options would be the best way to implement change. Future research evaluating the effectiveness of these strategies is warranted.

Poster U120– Megan Dahlke

Mentor: Kazuma Akehi

Title: *Determine the relationship between rapid muscle strength characteristics and joint kinetics utilizing the three-dimensional and traditional muscle strength analysis*

Context: During 4-12 months of the postoperative anterior cruciate ligament reconstruction (ACLR) rehabilitation, patients performed their thigh muscle strength assessment during dynamic and static movements to examine their knee stabilization and functionality. However, limited studies were conducted on rapid muscle strength characteristics and jumping performance. Objective: The purpose of the study was to examine the relationship between dynamic and static muscle strength characteristics after ACLR surgery. Participants: Seven subjects (age = 18.86 ± 2.75 years, height = 169.94 ± 13.41 cm, body weight = 77.00 ± 23.62 kg) with ACLR surgery occurring in the past 12 months completed the study. Procedure: Seven participants performed a vertical jump, unilateral jump, drop jump, and lateral bound in the three-dimensional motion capture platform to measure jump height (in), ground reaction force takeoff (GRF, N), net impulse (NS), hip torque (%), knee torque (%), ankle torque (%), landing depth (in), GRF landing (N), and GRF ratio. Additionally, participants completed the isokinetic muscle contraction on the isokinetic dynamometer and examined peak torque (PT, Nm), peak RTD (%/s), RTD 0-100 ms (RFD100), and RTD 0-200 ms (RFD200) were measured. Results: Quadriceps muscle strength characteristics (PT and RFD) had a strong negative correlation with net impulse during all jumping tasks ($P < 0.01$) as well as a moderate to strong positive correlation with loading and landing GRF in each jump task ($P < 0.01$). Quadriceps PT and RFD200 also moderately correlated with knee and hip torque production during a single-leg jump. During each jump task, Hamstring PT had mild to moderate correlations with landing depth ($P < 0.05$). Conclusion: Quadriceps PT and RTD were predictors for jumping performance and hamstring PT for safe landing strategies in ACLR rehabilitation. Clinicians can focus on improving PT and RTD on thigh muscles in patients who are not ready to begin direct jumping or dynamic rehabilitation exercises.

Poster U121– Alex Novicki

Mentor: Nita Unruh

Co-authors: Scott Unruh, Elena Robinson

Title: *Emergency Preparedness for Nebraska High School Coaches*

Context: This study is a continuation of research begun in 2011 that focused on Nebraska high school coaches' awareness and knowledge of emergency care

preparedness for athletic events or practices. Several organizations such as the National Athletic Trainers' Association have developed standards and expectations for proper healthcare in sports teams of varying levels, including secondary schools. The number of secondary school athletes and injuries is rising and therefore the need for proper training and professional healthcare grows too. With an accurate understanding and treatment of the various types of emergencies that can occur during athletic events and practices, we can see more efficiency when treating these athletes, help protect their overall well-being, and prevent many types of tragedy. Findings in previous studies have shown that many high school coaches do not have the appropriate education for these types of occurrences, nor were Emergency Action Plans properly put in place or practiced. Barriers to these implementations include school size, location of school, financial limitations, and an overall lack of knowledge or awareness among stakeholders within the athletic department. The objective of this study was to reassess current coaches' knowledge of such emergency cases and treatments and to determine their readiness with proper emergency action plans for various athletic venues.

Methods: Our Qualtrics survey was open to complete for four months. After the first two months, a reminder email was sent out to all those who had yet to participate. The topics of questions sent out included the class and sport they are involved in, information regarding their EAP procedures, and accessibility to emergency care and equipment. 2,863 emails were sent out, 593 completed the questionnaire yielding a 20% response rate.

Poster U122– Kelly Snelling

Mentor: Shannon Mulhearn

Title: *Transitioning to Student Teaching - A Self Study*

In order to become a certified teacher in Nebraska, a person must complete their degree coursework and also complete a semester of student teaching. For many students, the semester of student teaching is the first time they have been faced with maintaining a traditional job where they are required to be there from 8am-4pm. There is previous research that looks at new teachers' transition to their first jobs, but little attention has been given to understanding the challenges and support needed for undergraduate students who are simultaneously working their first full time job and meeting the ongoing requirements of being a full time student. In order to track this experience, I conducted a qualitative self-study using a digital journal to document my experiences. Every week, I created an entry on Wednesday that focused on challenges and successes, and on Fridays that focused on lessons learned. For the last Friday of each month, an additional prompt asked me to answer the question "Do

you see yourself as a change maker?”. A thematic analysis using constant comparison was used to investigate the data. This is an ongoing study, but themes from data collected in the first two months of school include, Working on Balancing Time, Finding Applying for Jobs Time Consuming, and Recognizing Self Growth. At this point in the student teaching process, I do recognize myself as a change-maker and appreciate the connections I am able to make with my students. The results of this study will help the Health & Physical Education program better prepare undergrads for student teaching.

Marketing, Agribusiness & Supply Chain Management

Poster U123 – Abigail Heins

Mentor: Heather Meyer

Title: *Local Business Website Demand Assessment: A 20-Mile Radius Survey*

The principal aim of this study is to investigate the demand for websites in local communities, given the increasing significance of keeping an online presence in order to achieve business success. It's clear that a lot of small businesses in the area are not keeping their websites updated, which affects customer decisions. It is imperative for organizations to take note of this requirement in order to modify and enhance their marketing methods properly. Therefore, the primary goal of this study is to provide marketers and website designers with useful support by providing them with thorough knowledge and educational materials based on extensive market research. Companies may better manage the changing demands of both consumers and companies by developing a greater grasp of the dynamics of website demand within local areas. As a marketing major, I believe that an organization's capacity to thrive online is crucial to not only the marketing industry, but every industry. For my research project, I went around to 13 local businesses and surveyed them about their website usage and social media presence. Although I researched within different industries, I found similar answers and results. In the end, this study aims to close the gap between local businesses' existing website usage and the potential for improved online exposure and interaction, promoting growth and competitiveness in the present digital world.

Poster U124 – Jimin Chae

Mentor: Ngan Chau

Title: *Supply Chain Resilience : A Literature Review*

In the aftermath of the far-reaching disruptions induced by the COVID-19 pandemic, global firms grappled with unprecedented challenges in their supply chains. This confusion heightened the focus on understanding and enhancing supply chain resilience among business practitioners as well as academic researchers. This study aims to understand different trends regarding supply chain resilience in the last four years and further investigate how resilience has been developed at companies through recent case studies.

To address the research questions, a bibliometric analysis was conducted over 315 research articles published in the Scopus database between 2019 and 2023. By examining publication-related metrics, citations, co-citations networks of articles and authors, and keyword occurrences, the study unveiled the evolving landscape of supply chain resilience research. Subsequently, a review of recent case studies was performed using the sample in the bibliometric study.

The bibliometric analysis revealed a substantial surge in the popularity of the supply chain resilience concept, particularly in response to the widespread disruptions following the COVID-19 pandemic. The number of relevant publications surged by over 300% over the period of 2019 - 2023, underscoring the growing importance of supply chain resilience. Further our case review highlighted key elements that would strengthen a company's supply chain resilience, including flexibility, adaptability, collaboration, information sharing, leadership, and strategic planning.

Fine Arts & Humanities

Art & Design

Poster 125 - Karina Boatright

Mentor: Nadine Saylor

Title: *The photograph is created with glass*

My project is to create a glass artwork that transforms 2D photographs into 3D glass objects. This idea was born out of my curiosity to break the stereotype that photography should be on a single plane. Generally, the density of colors in a photograph creates the illusion of depth. A flat two-dimensional photograph does not have physical distance. My intention is to create physical distance with images between panes of glass to create three dimensions. What would happen to the physical distance between the glasses if a photograph on each glass surface is superimposed?

Glass allows me to create real distance in my photographs and bring them to life. The artworks are created by two different techniques: glassblowing and kiln working. With the process of glassblowing, I start by making a small bubble that is cooled overnight. I apply the decals and put it back into the kiln to gather more molten glass on top. By repeating this several times, a physical distance will be created between the images. Fused glass is made by stacking 5 sheets of sheet glass with decals on them and placing them in a kiln. A single thick glass block is created by fusing them together. The thickness of each glass sheet creates a physical distance between the images. This is how I convert photographs from 2D to 3D using glass material and the result achieves breaking the theory of photography in my work.

Calvin T. Ryan Library

Poster 126 - Elizabeth Huggins

Mentor: David Arredondo

Title: *Application of Network Theory to Shakespearean Characters*

Within the world of Shakespearean plays, characters interact in cliques and groups, and form the character network, or cast list. Examining the character networks allows a person to determine a character's role and influence in the play. Naturally,

Shakespeare's plays often center around male leads, meaning that they often form the most connections between characters and groups. Where does this leave the women? While tragedies center around a man's fall from power and the destruction it causes to those around him, comedies are built around the idea of "coupling," of leaving the hints of the tragic world behind and finding fulfillment through marriage for its characters. This, of course, means that women play an essential role since they are half of these couples, but their power and degree of influence falls into two categories: those that defy their traditional, often submissive, gender roles and exercise their "masculine" power or those that hold to their given gender roles and have their actions heavily influenced by men and women alike. By applying character network analysis, one can observe the charted nodes and edges and determine the degree of influence that the female characters hold by seeing how interwoven and connected they are within the network.

Communication

Poster U127 - Kei Yamamoto

Mentor: Satoshi Machida

Title: *Relationship between "Kendo" and Communication*

Japanese martial arts are actively practiced all over the world, including the United States. This research especially focuses on Kendo (Japanese martial art) and investigates the relationship between Kendo and communication. Since Japanese martial arts emphasize the importance of the clear communication style, one can predict that experience of kendo would lead to more effective communication skills among those who practice kendo. This study also analyzes how the knowledge of kendo effects an individual's overall image of Japan. One can see that people who have knowledge of Kendo can be expected to have a better image of Japan. By proving that experience and knowledge of kendo significantly shapes communication styles and individuals' perceptions of Japan, one can expect that it will contribute to the Japanese government's efforts to promote Japanese culture.

Poster 128 - Maggie Bruno

Mentor: Tiffani Luethke

Title: *Using Photovoice to Understand Challenges and Strengths of MENA Women After Resettlement in the United States*

The purpose of the present study was to explore the challenges and strengths of Middle Eastern and North African (MENA) refugee women after resettlement in the United States (U.S.). The photovoice project involved 12 women who are from the MENA region and were resettled as refugees in the United States. The photovoice methodology invites participants to share photos of what is important to them. During six weekly sessions, participants met as a group to discuss their photos. We used thematic analysis to reveal emergent themes from the group session transcripts. Preliminary findings reveal needs of the refugee women and the desire to be close to family, friends, and community members. We hope that the findings of this study contribute to improving individual experiences following forced displacement and resettlement.

Poster 129 - Makayla Seal

Mentor: Kristen Majocho

Title: *Ethics in Health Care Communication: Supporting End-of-Life Decision Makers*

Every day someone is expected to make a decision that will end the life of their loved one, they are given the choice to keep them on life support or taken them off of it. The purpose of this literature analysis is to determine the ethics of health care communication of those chosen to make end-of-life decisions for a family member, loved one, or even patient. These decisions are ones that can carry a heavy emotional and mental weight for the person who makes them, and it is important that those people are prepared as effectively as possible to do so.

Not every death can be expected, but proper preparedness and planning is essential and recommended for families who have a loved one that has been diagnosed with a terminal illness or condition and are able to do so. It is important that the decision makers are working with the healthcare providers of their loved one to understand that person's care plan and what decision will be best for them given the situation. People who do not have next of kin that are able to make such decisions are likely to receive a court-appointed guardian that would assist in the decision-making process.

Regardless, it is important that the decision maker is competent, fully understands the terminally ill person's condition, and is aware of any additional options and the values and wishes held by the patient, ideally.

Death is inevitable but it is something that we tend to be very scared of. The fear that we associate with death is natural and valid, but society should treat these situations with more grace. Improving informational, healthy communication about death, grief, and end-of-life decisions will increase knowledge of the public as well as increase accessibility to the best options for people who find themselves in that situation.

Poster 130 – Yujin Jeong

Mentor: Kristen Majocho

Title: *Exploring the Synergy of Gen-AI*

In both personal and academic situations, being persuasive involves three main factors: credibility, emotional appeal, and logical reasoning. Recently, during a group project discussion, I had to convince my teammates to go with my idea. First off, I made sure to establish my credibility by highlighting my research on the topic and my past successes in similar projects. Then, I appealed to their emotions by sharing stories about how our idea could solve problems we'd faced before, making it feel more personal and relatable. Finally, I backed up my argument with logic, presenting data and examples to show how our idea would work effectively. This mix of credibility, emotion, and logic convinced my teammates and got them excited about our project.

Moving forward, I'll keep using these same techniques. I'll continue to establish my credibility by showing my knowledge and reliability. I'll also tap into emotions by sharing stories and making ideas feel relevant to people's experiences. And of course, I'll always support my arguments with logic and evidence. By balancing these three elements, I'll be able to persuade others effectively in both personal and academic situations, making sure my ideas are heard and understood. In both personal and academic situations, being persuasive involves three main factors: credibility, emotional appeal, and logical reasoning. Recently, during a group project discussion, I had to convince my teammates to go with my idea. First off, I made sure to establish my credibility by highlighting my research on the topic and my past successes in similar projects. Then, I appealed to their emotions by sharing stories about how our idea could solve problems we'd faced before, making it feel more personal and relatable. Finally, I backed up my argument with logic, presenting data and examples to show how our idea would work effectively. This mix of credibility, emotion, and logic convinced my teammates and got them excited about our project.

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elements, I'll be able to persuade others effectively in both personal and academic situations, making sure my ideas are heard and understood.

Music, Theatre, & Dance

Poster U131 – Sadie Uhing

Mentor: Timothy Farrell

Title: *Piston vs. Rotary Valves: The Differences Between Trumpets and Traditions in America and Europe*

The musical culture regarding the history of the trumpet varies greatly in the European countries, specifically Germany. Bad Sackingen, Germany takes great pride in being the “Trumpeter’s City,” and holds one of the world’s most in-depth and vastly celebrated trumpet museums. One of the biggest questions that has been asked with this topic is, “What is the physical differences between the piston valves and rotary valves?” With research supported from this museum, and from other reliable sources, questions regarding the time-honored traditions of the rotary valved trumpet will be answered. Questions such as the difference between the popularized piston valved trumpets in America versus the traditional rotary valved trumpets in Europe will be addressed. Other areas of research that will be covered in this discipline is the significance of tradition in classical and orchestral playing in America and Europe, the differences in sound and technicality between the two styles of trumpets, and the history leading to the manufacturing of both the piston and rotary valves. The trumpet museum in Bad Sackingen is dedicated to the broad spectrum of trumpet making over four centuries. With this incredible source experienced first-hand, the stages of development of the trumpet as well as the social and cultural connections between Europe and America will be expressed in great detail.

English

Poster U132 – Theresa Ascherl

Mentor: Rebecca Umland

Title: *Out with the Old and in with the New? The Convergence of Science and Magic in Diana Gabaldon's Outlander*

Diana Gabaldon's highly successful Outlander series, both the nine-novel and the eight season TV series, has captivated audiences worldwide, using a blend of historical fiction, romance, fantasy, and adventure. I focus on the first novel, Outlander (1991). Gabaldon's time travel work weaves an intricate story filled with tension through the mysterious disappearance of her protagonist Claire, from 20th century Scotland and her abrupt awakening in 18th century Scotland. This idea of being transported back in time has been popular since it was originally brought to life in Mark Twain's novel, A Connecticut Yankee in King Arthur's Court. The tension relies heavily on the interplay between science and magic, prompted by Claire's background as a WWII nurse. Gabaldon draws upon her academic training in the hard sciences to create a narrative where modern medicine clashes with superstition and folklore. Gabaldon uses her expertise in zoology, marine biology, and behavioral ecology to create a compelling narrative of her heroine, Claire, a nurse knowledgeable in both new medicine as well as older herblore and other natural remedies. Gabaldon also uses her research expertise to compose her use of time travel through the stones at Craig na Dun, creating a tension for Claire between scientific rationality and the supernatural. To do this, Gabaldon spent time researching the world's ley lines and how they, theoretically, they might cause disappearances, which makes the fantastical idea of time travel into something based on science, allowing the reader to feel as though it could be real. Following suit, Gabaldon's character Claire struggles to reconcile the 18th century superstitions with her 20th century knowledge of medicine and science. She faces resistance and even peril at the hands of people who do not understand that her medicine is that of science and not witchcraft. Claire is stuck between saving others and saving herself, which not only drives the plot but also highlights the moral and philosophical dilemmas she faces. Gabaldon's use of the mysterious stones and how they work also creates a moral tension in Claire. Even though she knows she can change the past, she must ask herself if she should. In essence, Gabaldon's Outlander stands as evidence that the blurred lines between science and magic create an appeal in audiences. Gabaldon uses a masterful blend of historical and scientific accuracy and imaginative storytelling which invites the reader to become immersed in two worlds at once, as the story unfolds, accounting for its enormous literary and film success.

Poster U133 – Trinity Angle

Mentor: Janet Graham

Title: *Hi Barbie! What do You Say We Disassemble The Box?: Gender Capitol & Masculine Spaces*

The evolution of The Masculine Box Theory throughout my research here at the University of Nebraska at Kearney has undergone many changes. First, with Viet Thanh Nguyen's novels *The Sympathizer* and *The Committed*, The Masculine Box was defined to understand the societal pressures of the central male characters that were detailed in them. However, my research progressed to an exploration into all kinds of subordinative masculinities. Not just Vietnamese men underneath American hegemony, but also black men, Japanese American men, and queer men who occupy and interact with various masculine spaces. This was to give me a wider range of knowledge for the broad range of masculinities that The Masculine Box might affect (men of varying races, socioeconomic statuses, ethnicities, sexual identities, etc.). During the defining of The Masculine Box, questions naturally arose like: Where can The Masculine Box be observed? How does Masculinity function? And what do these implications have for society? Throughout the SSRP this summer, I read John Okada's novel *No-No Boy* and analyzed it alongside Nguyen's *The Sympathizer* and *The Committed*—while also reading a significant amount of masculinity theory and gender theory. Then, last fall I spent time rereading these novels through this theoretical lens I had defined and applied throughout the last year and a half. The Fall research semester ended with a rough draft for a potential paper to publish in the future. Like some researchers, I began recognizing the connections of my work to every little thing I read or wrote about. Which is reflected in the paper's namesake the—now Golden-Globe winning—movie *Barbie*. This movie had come out in July and mentioned a lot about Boxes, and patriarchy, and... Barbie-Land. This had to be prefaced with what my research questions and the eventual conclusion became, which was: What if it were possible instead, to draw inspiration from the marginalized masculinities which have created a space for more positive masculinities to exist and to disassemble and then mold The Box into a hegemonic masculinity which is less confining? This process will contain significantly less comedic moments and pink glittery success as the *Barbie* movie, but it is possible that the existence of these novels and the *Barbie* movie suggest that this molding process has already started.

History

Poster U134 – Ellery Simpson

Mentor: Torsten Homberger

Title: *The Alt-Right: A Comparative Outlook of Radicalized Political Groups of Yesterday and Today*

Studying the Alt-Right movement within the United States is crucial to understanding its impact on society, politics, and culture. By examining its ideology, tactics, and appeal, we can identify and address underlying societal divisions, extremist rhetoric, and threats to democratic norms. Moreover, understanding the alt-right's rise sheds light on broader trends in political polarization, social media influence, and the dissemination of misinformation, helping to inform strategies for countering extremism.

In comparing Robert O. Paxton's ideas surrounding fascism with George Hawley's take on the Alt-Right movement, this study aims to point out any similarities between how fascists operated in the past and how the Alt-Right behaves today. By examining these two ideological frameworks side by side, we seek to identify shared patterns and divergent tendencies, offering insights into the evolution of authoritarian ideologies and their manifestations in modern political discourse.

Amidst the resources used for this research, there is ample foundation to declare that the movements, both those of past fascist movements and the current alt-right, are comparable. Paxton provides a substantial basis for this research as he claims fascism exists at the stage one level within all democratic countries, not excluding the United States. Though Paxton's study focuses on the actions of the "fascists" this study looks more toward the words as well as the actions of both.

Poster U135 – Logan Osmera

Mentor: Will Stoutamire

Title: *Jenners Zoological, Educational, and Amusement Park: Curiosity and Colonialism in Rural Nebraska*

This poster examines the history of Jenner's Park in Loup City, Nebraska, as a microcosm of the colonialist museum in the early twentieth century. Founded by two wealthy British immigrants, Henry and Robert Jenner, the park operated until 1941, serving for four decades as a popular destination for entertainment and education for rural and small-town Nebraskans. The park housed many different attractions, including exotic wildlife, Egyptian mummies, and a museum building styled after the British Museum as a cabinet of curiosity. This museum housed artifacts from all over

the world, including ancient cuneiform tablets, a suit of Chinese armor, Congolese spears, Polynesian shrunken heads, and clothing allegedly taken from the body of a medicine man after the Wounded Knee Massacre.

Jenner's Park serves as a case study of the influence the wider museum movement of the early 20th century had on smaller, rural museums. Surviving records, including a complete inventory of the museum's collections, provide insight into how colonialist practices of collection, display, and interpretation in larger institutions, such as the British Museum, were adapted by rural communities.

This project has two major goals: (1) Creating and analyzing a database of the park's collections and (2) mapping the park. The first goal includes locating where and how the Jenners acquired their artifacts, and where their artifacts ended up after the park closed. Using an existing inventory of the park's collections from the 1920s, newspaper research, oral history, and other methods, we are creating a collections database that allows us to see how Jenner's Park interpreted the world. The second goal involves the use park tour guides, hundreds of park photographs, and the existing ruins of the park in Loup City today to remap the park grounds and digitally recreate the park.

Poster U136 –Delaney Tracy

Mentor: Will Stoutamire

Title: *Shall We Aspire to Greatness, and Then Do Great Things?: The Frank Businesses in Kearney, Nebraska*

The city of Kearney was incorporated in 1873, and over the following two decades the city experienced a boom in both population and industry. One of the key figures in Kearney's industrial development was George W. Frank, an entrepreneur originally hailing from New York who purchased the Kearney Canal and completed construction on it in 1886. With it, Frank brought hydroelectric power to Kearney to fuel other emerging industries, with which Frank himself was often involved. In spite of these contributions, all of the Frank businesses would be sold or shut down by the turn of the twentieth century. While the Frank family name lives on in their preserved home and the museum associated with it, little research has been conducted to determine the extent of George Frank's influence on the early development of Kearney and why his companies experienced such a dramatic breakdown during the last decade of the nineteenth century. Through investigation of primary and secondary sources found in the Frank Museum archives and online, particularly newspapers from the time, a pattern of high-profile living along with heavy reliance on credit emerges, and the economic downturn experienced across the country as a result of the Panic of 1893

contributed to poor business decisions that failed to save the numerous businesses operated by the Franks and, in fact, turned public opinion in Kearney against them. This research not only provides insights into George Frank's businesses and the early history of Kearney but also sheds light on the impact of the industrial era and the Panic of 1893 in rural communities.

Index of Participants



Participants

Abels, Noelle
Alimi, Lateefat
Andreasen, Natalie
Angle, Trinity
Arai, Yuki
Ascherl, Theresa
Bahe, Lauren
Bartak, Bre
Becerra Gonzalez, Melisa
Bengston, Maddie
Bennett, Karley
Berggren, Kaitlyn
Bernthal, Alexis
Boatright, Karina
Bock, Amber
Boley, Jesse
Broadwell, Lacey
Brodd, Kenan
Brosius, Britney
Brown, Conner
Bruno, Maggie
Bryant, Macy
Buhlke, Ella
Burke, Kelcie
Bursaw, Samantha
Cantillo, Francisco
Carfield, Jordan
Carlson, Zane

Chae, Jimin
Chavez Monasterio, Alexis
Cheku, Sunayn
Clark, Simon
Cooley, Sadie
Cordes, Kelsey
Cornelio, Katie
Costello, Chelsey
Cruikshank, McKenna
Dahlke, Meghan
Das, Prajna
Davis, Preston
Dittmer, Kyle
Dowhower, Emma
Doyle, Wryleigh
Drake, Katie
Driewer, Melanie
Dubas, Austin
Dubas, Dana
Dunbar, Oliver
Dvorak, Trevor
Engel, Julia
Erdman, Brenna
Everitt, Adam
Ferguson, Ella
Fill, Ianna
Flaugh, James
Flowers, Emily
Folk, Gwendolynn
Forsberg, Megan...
Frels, Clay
Fuqua, Hailey
Garbe, Megan
Garcia Escobar, Mariam
Garcia-Retana, Kennia
Getz, Maddie
Gleason, Nolan
Gomez, Kimberly
Goodwin, Grace
Green, Ibinye
Green, Amanda
Grieser, Riley

Hancock, Paiton
Hanika, Malaika
Hardy, Hannah
Harrison, Hannah
Haselhorst, Isaac
Headley, Sam
Heins, Abigail
Helmer, Davin
Helmer, Kinley
Henderson, Alethia
Hernandez, Carlos
Hernandez, Dayana
Hiatt, Joseph
Hirosawa, Ran
Hoffman, Claire
Hoover, Marissa
Huber, Theo
Huggins, Elizabeth
Jensen, Tell
Jeong, Yujin
Johnson, Dylan
Kariuki, Wangeci
Kempt, Shanon
King, Alyssa
Kingery, Kael
Klein, Reagan
Koenig, Michelle
Korte, Alex
Kosmicki, Dawson
Kraft, Emma
Kraft, Tobias
Kreager, Carson
Kreikemeier, Austie
Larbey, Kim
Law, Anna
Lawrence, Arielle
Lewis, Ryann
Lilla, Nate
Little, Addyson
Loescher, Meah
Longfellow, Jaden
Lopez-Munoz, Carlos

Loya, Gabby
Marshall, Sondra
Maruyama, Daichi
McClure, Johanna
McDonald, Cassie
McEvoy, Sara
Mendez-Ortiz, Esmeralda
Menke, Breyer
Merrihew, Juliana
Meyer, Amelia
Meyer, Noah
Mitchell, Kenny
Molina, Temo
Montanez, Jose
Moore, Tatiana
Morhain, Mason
Moss, Carter
Nava, Arlet
Neff, Peyton
Nelson, Christina
Nelson, Claire
Neuhaus, Bella
Neukirch, Elizabeth
Nicksic Sigmon, Chloe
Nour, Mohmmed
Novicki, Alex
Oborny, Gabrielle
Osmera, Logan
Paisley, Josh
Paloucek, Lucas
Paysen, Joe
Perez, Juana
Peterworth, Braden
Plachy, Clare
Rajput, Sunanda
Ramirez, Naara
Reeson, Bryce
Reeves, Chris
Rhea, Ariel
Robertson, Paxton
Roeder, Joseph
Rohs, Sierra

Rother, Caleb
Ryan, Falan
Sadd, Kattie
Schardt, Jonathan
Schroeder, Samuel
Seal, Makayla
Searle, Carleigh
Settles, JD
Shackelford, Noah
Sharma, Bhavya
Simpson, Ellery
Sindelar, Payton
Snelling, Kelly
Snider, Sam
Spengler, Janet
Steinman, Paige
Steinman, Piper
Sutton, Bryce
Swisher, Courtney
TenBensel, Megan
Thoendel, Brooke
Tobias, Mallory
Tracy, Delaney
Trejo, Lizbeth
Truex, Kiley
Turk, Belle
Twohig, Ethan
Uhing, Sadie
Vargas, Hernan
Verba, Braelyn
Volk, Elise
Vosoughi, Elina
Wahls, Caitlynn
Waller, Ella
Wetovick, Kristen
Yamamoto, Kei
Yarnell, Seth
Young, Cady
Youngdahl, Libby
Zamorano Morales, Jazmin
Zimmerman, Hannah