

Research Week 2021

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

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



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



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



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

Schedule of Events

April 1 – April 2, 2021



Tuesday, March 30

New Frontiers 2019-2020 Awards

11:00 am – 12:00 pm 2019-2020 Awards

Wednesday, March 31

New Frontier Faculty Awards

10:30 – 11:30 am 2020-2021 Awards

Note: All times are in Central Time Zone

Schedule of Events

April 1 – April 2, 2021

Nebraskan Student Union Ponderosa Rooms



Thursday, April 1

8:00 am to 12:00 pm Students set up posters, Ponderosa C&D

1:00 pm to 4:00 pm Open poster viewing, Ponderosa C&D

10:00 am to 3:30 pm.....Oral Presentations

Friday, April 2

8:30 pm to 3:30 pm Oral Presentations, CMCT 101 (public viewing via Zoom)

4:30 pm..... Awards Ceremony & Reception via Zoom

Note: All times are in Central Time Zone

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Office of Undergraduate Research & Creative Activity

unk.edu/ugr

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

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

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

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

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

Librarians are key partners for your research. But don't just take our word for it.



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* Shelby Hinrichs

"I loved having all of these databases available to me and I knew I could trust the sources that came up because they were trusted by the library."

Mackenzie Marrow

"Thank you so much for your help and time! I guess I was not typing in the right phrases, because now I'm finding a lot."

Taylor Ritz

* Winner of the 2018 Library Award
for Undergraduate Research

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UNK Graduate Programs

ART (308) 865-8082

Art Education (MAEd)

- Classroom Education Emphasis❖
- Museum Education Emphasis❖

BIOLOGY (308) 865-1589

Biology(MS)

- Thesis■
- Non-Thesis❖

BUSINESS MBA (308) 865-8346 LTC(308) 865-8240

Business Administration (MBA)

- Accounting◆
- Human Resources◆
- Marketing❖
- Professional❖

Long-Term Care Management (MS)❖

COMMUNICATION DISORDERS (308) 865-8300

Speech/Language Pathology (MSEd)■❖

COUNSELING & SCHOOL PSYCH (308) 865-8508

Clinical Mental Health Counseling (MSEd)◆

Counseling (EdS)◆

Drug & Alcohol (Certificate)❖

Higher Education Student Affairs (MSEd)❖

School Counseling Elementary (MSEd)◆

School Counseling Secondary (MSEd)◆

School Psychology (EdS)■

EDUCATIONAL ADMINISTRATION (308) 865-8512

School Principalship PK-8 or 7-12 (MAEd)❖

School Superintendent (EdS)❖

Supervisor of Special Education MAEd)❖

ENGLISH (308) 865-8299

English (MA)❖

HEALTH SCIENCES (308) 865-8325

Health Sciences (MS)❖

HISTORY (308) 865-8766

History (MA)

- Thesis■❖
- Non-Thesis■❖
- Public History■❖

Public History (Certificate)❖

KINESOLOGY & SPORTS SCIENCES (308) 865-8331

Athletic Training (MATR)■

General Physical Education (MAEd)

- Sports Administration■
- Recreation and Leisure■

Exercise Science (MAEd)■

Physical Education – Master Teacher (MAEd)

- Pedagogy❖
- Special Populations❖

MODERN LANGUAGES (308) 865-8082

Spanish Education (MAEd)❖

Spanish Graduate Certificate❖

MUSIC (308) 865-8618

Music Education (MAEd)❖

PUBLIC COMMUNICATION (308) 865-8737

Public Communication (MA)❖

SCIENCE/MATH EDUCATION (308) 865-8043

Science/Math Education (MSEd)❖

- Integrated Option❖
- Chemistry Option❖

TEACHER EDUCATION (308) 865-8513

Curriculum & Instruction (MAEd)

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

Instructional Technology (MSEd)

- Instructional Technology❖
- Information Technology❖
- Leadership in Instructional Technology❖
- School Librarian❖

Reading PK-12 (MAEd)❖

Special Education (MAEd)

- High Ability Education (Gifted)❖
- Advanced Practitioner❖
 - Behavioral Intervention Specialist❖
 - Assistive Technology Specialist❖
 - Inclusive and Collaboration Specialist❖
 - Functional Acad Skills & Independ Living❖
- Special Education Generalist❖

For information contact:
UNK Graduate Studies
800-717-7881 | 308-865-8500
Gradstudies@unk.edu

◆ Blended Program ❖ Online Program ■ Campus

Graduate Poster Abstracts



Fine Arts & Humanities

English

Poster G01 – Valerie Owens

Mentor: Amanda Sladek

Title: *Rethinking "Inspiration Porn": A Deconstruction of Disability Representation*

In her work *Feminist, Queer, Crip*, feminist scholar Alison Kafer deconstructs disability representation in advertising, in particular The Foundation for a Better Life's (FBL) billboard campaign. Kafer questions what are considered acceptable community values and the ways in which disabled bodies are exploited in promoting these values. She then proceeds offer alternatives for "queering and crippling" the billboards, and reconstructing "what constitutes a better life." Based off of Kafer's ideas, I have created visual renderings "queering and crippling" existing FBL billboards, and also bringing to life possible alternatives to existing disability representation that fall into the category of "inspiration porn." I do so to highlight the flaws in disability representation and to call into question what values are most beneficial to a community. My series includes nine

renderings based off Kafer's descriptions of reimagined billboards. I highlight Leroy F. Moore, Collette O-Toole, Michael J. Fox, PISSAR (People In Search of Safe and Accessible Restrooms) Activists, ADAPT Activists, Nomy Lamm, Mia Mingus, and Marlon Shirley, and promote resistance, dissent, solidarity, and direct action, as well as subvert traditional portrayals of courage and inspiration.

Poster G02 - Tanya Jo Woodward

Mentor: Janet Graham

Title: *Katholikos, Exile, and Diaspora in the Writings of Edwidge Danticat and Uwem Akpan*

How does spirituality impact writers in exile or diaspora? This presentation will explore the role of faith and the influence of "diaspora" and "exile" in the writings of Edwidge Danticat and Uwem Akpan. Edwidge Danticat, a diaspora (Haitian immigrant), grew up both in the States and in Haiti with her minister uncle. Nigerian Uwem Akpan writes as both a Jesuit priest and an expat-exile. Both writers have a *katholikos*, or a universal, "catholic," spiritual appeal. Akpan stated, "it [is] very clear that the joys and anguish of the world are the joys and anguish of the Church." As Camila Alvarez observes in "Creating Cultural Sensitivity," both Danticat and Akpan uniquely engage with the whole personhood of the reader, or

the “physical, mental, and spiritual” aspects of people. Yet, both writers compose stories in such a way as to portray the characters and themselves “within the context of their entirety” (Alvarez n.p). Their intersectionality as diasporic-exile-expats makes their writing more compassionate, full of mercy and joy. This challenges readers to consider their whole personhood and what it means to be diasporic and an exile today.

Behavioral & Social Sciences

Counseling, School Psychology and Family Science

Poster G03 – Annie Fish

Co-Author: Dawn Mollenkopf

Mentor: Dawn Mollenkopf

Title: *Flexible Freshman: Assessing the relationship between Adverse Childhood Experiences and supports in post-secondary education.*

The purpose of this research is to gain an understanding about the relationship between students' Adverse Childhood Experiences (i.e. potentially traumatic events that can have negative effects on health and well-being) and students protective and resiliency factors on student success in their freshman year of college. Our research question is asking to what extent do Adverse Childhood Experiences predict college success of freshman? Our second research question is asking to what extent do protective factors and personal resiliency mitigate the negative impact of ACE's?

Participants included Freshman students at the University of Nebraska Kearney. Researchers examined their Adverse Childhood Experiences and compared it with their past and current protective factors. Researchers administered a Pre-Test Survey in the Fall Semester to Freshman. Then researchers will administer a Post-Test Survey to

Freshman in the Spring Semester to compare. Researchers will use the results from the survey to determine if increased protective factors helps combat students Adverse Childhood Experiences and increases retention on campus.

Educational Psychology

Poster G04 – Kendra Hoffert

Co-Author: Anna Tussing

Mentor: Tammi Ohmstede-Schmoker

Title: *Extracurriculars as a Predictor of Stress Level in Adolescents*

Previous research has highlighted the impact of stress, as a major factor in the lives of high school students. Stress is a common experience for high school students, with the majority of students reporting feelings of excessive stress on a daily basis (Anda, et al., 2000). When asked about specific causes of their stress, future goals were the most common response. The next four most common stressors all school related (Anda et. al., 2000). An extracurricular is any club or sport that does not provide the student school credit. According to the United States Census Bureau (2014), 57% of children participate in at least one extracurricular activity. Students dedicate many hours to these activities and so it is important to understand the consequences that may result from involvement in extracurricular activities. This study explored the relationship between extracurricular involvement and stress levels among high school students. A better understanding of the factors

contributing to the stress in students can assist educators to mitigate its affects.

Poster G05 –Shelby Glaser

Mentor: Tammi Ohmstede-Schmoker

Co-Authors: Ravin Baker, Whitney Walker Moore

Title: *The Effect of Social Media Use on Self-Esteem*

Previous research suggests that the use of social networking sites (SNSs) often leads people to make upward comparisons to others (Vogel, Rose, Roberts & Eckles, 2014). In accordance with past research, we had the research question of: Is the amount of social media use a significant predictor of self-esteem? Undergrad students in a general psychology course participated in our study. Participants were asked to answer survey questions about their social media use, as well as questions about their self-esteem (Rosenberg, 1965). The results of the regression indicated that social media use did not significantly predict self-esteem, $F(1,67)= 2.103$ $p=.15$. The results of the regression indicated that Youtube use significantly predicted self-esteem, $F(1,67)=11.73$, $p<.01$.

Natural & Physical Sciences

Biology

Poster G06 – Alyssa Meier

Co-Authors: Andrew Little, Dustin Ranglack

Mentor: Dustin Ranglack

Title: *Effects of human hunter movement and site selection on observation rate of white-tailed deer (Odocoileus virginianus)*

Hunting is the primary tool for population control for many ungulate species across the United States, including white-tailed deer (*Odocoileus virginianus*). Previous research has focused primarily on the effects of hunting on prey behavior while neglecting the potential effects hunter behavior has on the probability of harvest success. Hunters make numerous active decisions while hunting that affect their probability of success, such as where to hunt on the landscape and hunting method (i.e. ground-blind, tree-stand, still hunting). Because wildlife managers rely on hunting for population control, it is important to understand and quantify hunter behavior to more confidently meet management goals. In this study, I examine hunter movement patterns and site selection and assess how these parameters affect hunter observation rate of white-tailed deer. The information provided by my research will help educate hunters on becoming more effective and efficient, and inform wildlife managers on methods to more reliably meet harvest quotas.

Professional & Applied Studies

Kinesiology & Sports Sciences

Poster G07 – Stefanie Neal

Mentor: Megan Adkins

Title: *Understanding the Impact of COVID-19 on students at The University of Nebraska at Kearney*

The devastation of the COVID-19 Pandemic has altered the health and wellness of Americans across the nation causing trauma and the long-term effects remain unknown (Boyras & Legros, 2020). Young adults suffer a significant negative impact upon mental and physical health following disaster events like a pandemic (Russel, Hutchison, Tambling, Tomkunas & Horton, 2020). In particular, college students have been impacted by the pandemic through experienced loss, uncertainty, uncontrollable changes to health and wellbeing as well as increased unpredictability in food, housing, and financial resources all of which are known to increase physical and mental distress (Paterson, 2020). Individuals respond to disasters differently and in order to improve outcomes in the young adult population it is necessary to understand their experiences with COVID-19 (Schlesselman, Cain, & DiVall, 2020). Perceptions of risk, safety, anxiety, helplessness, willingness to cope, and

physical and mental health are important factors which predict successful outcomes for students under significant stress (Leme, 2020).

The purpose of this research project is to evaluate student perceptions of knowledge, distress, coping willingness, and level of safety/control related to the COVID-19 Pandemic. The secondary purpose is to gather student experiences in the areas of physical health, and mental wellness, as students on UNK's campus to identify areas for development in order to support the mental and physical health of all students during the pandemic.

Poster G08 – Josie Cox

Mentor: Gregory Brown

Title: *Comparison of Perceived and Measured Physical Fitness in College Students.*

Regular physical activity has many health benefits including a dose-response relationship between physical activity and premature mortality and primary and secondary prevention of numerous chronic health conditions. Physical fitness refers to the ability of a bodies systems to work together efficiently to perform activities of daily living, structured exercise, or other forms of physical activity. Measuring physical fitness can be very useful in designing an exercise program, but physical fitness testing can be time consuming and requires specialized skills. Perceived fitness refers to a person's self-perception of their level of physical fitness. Perceived fitness can influence a person's participation in health related physical activity, which can influence their willingness to engage in

adequate amounts and intensities of health promoting physical activity. One way of measuring a person's perceived fitness is through the International Fitness Scale (IFIS). The IFIS is a simple, valid, and reliable five question survey that can be used to assess overall perceived physical fitness, cardiorespiratory fitness, muscular fitness, speed-agility, and flexibility on a five point scale. The primary purpose of the current study is to perform a retrospective analysis of data collected during spring semester 2020 as part of a classroom based learning experience comparing college student's perceived fitness using the IFIS and their measured cardiorespiratory fitness, muscular fitness, speed-agility, and flexibility. The researcher plans to compare the IFIS rank of each participant with the measured physical fitness quintile ranking

Poster G09 – Taylor Rogers

Mentor: Kazuma Akehi

Title: *Relationship between athletes playing positions and body type on the prevalence of low back pain in competitive collegiate athletes*

The prevalence of low back pain has been reported among athletes in many different sports with the high prevalence rate among football players being reported at 60%. It could be thought that sports with certain postures such as football, wrestling, and throwing events in track and field could put an even greater load on the lumbar spine. High pressure movements and twisting and high velocity in those aforementioned sports are examples of the underlying mechanisms that may result in the development of low

back pain. The direct effects of these low back injuries could also lead to life-long implications for young athletes. Purpose: The purpose of this study is to determine whether competitive colligate football linemen have a significantly higher prevalence of low-back pain compared to other positions in football. Additionally, similar body type and athletic work/motion as the football lineman such as heavy weight class wrestlers and throwers, will be studied to examine if there are differences among the sports. Method: The health history survey will be distributed to the collegiate competitive athletes who are currently in the active roster of football, wrestling, and field athletes at UNK, and those who are age of 19 years or older. The health history survey will be distributed using Qualtrics. Clinical Application: The data will be applied to low back injury prevention strategies in their training programs and will be used to develop appropriate techniques for prevention and recovery.

Poster G10 – Mackenzie Hamilton

Mentor: Megan Adkins

Title: *The Teaching Must Go On! NE STEM 4U After School Program in the Time of COVID-19*

After School programming provides a safe and educational space for students to build positive affective experiences critical for pre- and early adolescent development. The COVID-19 pandemic crippled most after school community programming within the past year, decreasing educational opportunities for underprivileged Pk-8th grade students, especially in rural communities. To assist in bridging the after school educational

programming gap, the UNK NE STEM 4U PA program collaborated with one rural school district to develop a curriculum taught by after school personnel, rather than a community partner, due to school attendance restrictions. The NE STEM 4U PA provides educational content related to STEM careers, taught through movement. The program has been successfully integrated into the school district for the past two years with community educators attending the schools to teach the topics. The purpose of the research project was to evaluate the NE STEM 4U program built for after school personnel to teach, rather than the community partner. The secondary purpose is to gather teaching experiences and perceptions about the NE STEM 4U education programming in order to assist in the evaluation of the curriculum. An email invitation to participate in the study was sent by the after-school program director to after school staff. The online survey included 15 closed-ended questions, pilot-tested with three reviewers to establish content validity.

Poster G11 – Amy Kofoed

Mentor: Kazuma Akehi

Title: *Assessing the Post-treatment Time Effects of Active Release Manual Therapy on Quadriceps Muscle Anthropometric and Strength Character*

Active release manual therapy has become a more popular soft tissue technique for treating a range of musculoskeletal injuries. This treatment reduces adhesions and fascial restrictions, and provides function improvement, enhanced healing, and performance. While studies have been

done reduce pain and increase ROM and strength, there is no evidence to show the lasting effects of this therapy. Purpose: The purpose of the study is to determine the time effects of active release manual therapy on lower extremity muscle anthropometric characters and strength properties at different post-treatment times. Methods: Twenty competitive collegiate football players will be recruited in the current study. Prior to the treatment, each subject will have their quadriceps muscle size and quality measured using the diagnostic ultrasound and lower extremity force outputs using a vertical jump testing. Subjects will then be randomly assigned one of the interventions (active release or control) for a total of 10-minutes and then will remeasure their muscle size and quality, and dynamic muscle strength immediately after the intervention, 1-hour and 24 hours of the intervention. Subjects will receive another treatment after 7 days of the first visit. Clinical Application: The results of this study can help define the time restraints of active release manual therapy. This is beneficial to determine the most appropriate time of application for athletes which can increase their benefits to maintain athletic performance and prevent injuries.

Poster G12 – John Masker

Mentor: Kate Heelan

Co-Authors: Joey Eisenmann

Title: *Classifying weight status in adolescent girls: does biological maturity matter?*

Purpose. Age-and-sex-specific BMI percentiles have been used for years to screen and classify weight status for children and adolescents . However, maturation-related misclassification may result during adolescence [Pietrobelli, 1998 & USPSTF, 2017]. The purpose of this investigation is to determine the rate of weight status misclassification among adolescent girls due to standard chronological age-and-sex matched reference data at age 12.

Methods. Females (n=221) in grades K-8 participated in school health screenings from 2006-2020. Age-and-sex-specific BMI percentiles were calculated at age 12, and weight status was determined based on CDC growth charts. Height velocities were graphed based on longitudinal anthropometric data from age 8-14 years to determine somatic maturity (biological age) based on age at peak height velocity. The number (%) of participants whose weight status was misclassified when adjusted for biological age was determined.

Results. Based on chronological age, 27% of participants were classified as overweight (13%) and obese (14%). The distribution of early, average, and late maturers was 38%, 34%, and 28%, respectively. When adjusting for biological age (12.1 ± 0.9 years), 6% (14/221) of participants were reclassified, with 1.4% obese participants reclassified as overweight, and 2.3% overweight participants reclassified as normal weight.

Underestimations of obesity were also seen with 2.3% of normal weight participants reclassified as overweight and 0.5% overweight participant reclassified as obese.

Conclusion. Our study represents the potential differences that may be seen in weight status classification when using biological age as a reference versus the traditional chronological age method.

Teacher Education

Poster G13 - Kylie Wallace

Mentor: Martonia Gaskill

Title: *Impact of Healthy Relationships in School on the Social and Emotional Health of Secondary Students*

Secondary students developing healthy relationships at school has been acknowledged by researchers as a crucial component in creating positive social and emotional health. Not only are healthy relationships pertinent to positive social and emotional health, but also students' success in the classroom (Murray-Harvey & Slee, 2007; Strahan & Poteat, 2020). Because of these recent findings and studies, schools are now recognizing the increasing need for opportunities to cultivate the positive social and emotional health of all students in their building. With this increasing knowledge, studies have shown schools implementing programs and interventions to promote healthy relationships and offering skillsets students need to apply in their daily lives. The purpose of this research was to determine the effects of healthy relationships on the social and emotional health of secondary students at school. In

this presentation, I'll share preliminary results of a study that explored healthy relationships at school and why this is important and a major concern.

Undergraduate & Graduate Oral Presentation Schedule



Thursday, April 1

Room: CMCT #101

- 10:00 am --- **Baylee Miller:** *Inter-Workings of Middle Eastern Terrorism* (Mentor –Chuck Rowling)
- 10:30 am --- **Wynn Cannon:** *Online Interactions During a Pandemic* (Mentor – Tiffani Luethke)
- 10:45 am --- **Chul-Hyun Jeong:** *Synthesis and Investigation of Photophysical Properties for 1,8-Naphthalimide Derivatives* (Mentor – Haishi Cao)
- 11:00 am --- **Bailey Reigle:** *Exploration of Accessible Resources and Services For Adults with Intellectual Disabilities* (Mentor – Toni Hill)
- 11:15 am --- **Lauren Rezac:** *The Intergenerational Bonding Program (IGB) - A Pilot Study* (Mentor – Ladan Ghazi Saidi)
- 11:30 am --- **Braydon Conell:** *Community Activation: Response to AIDS in Chicago* (Mentor – Linda Van Ingen)
- 2:15 pm ----- **McKenna Vininski:** *Sex hormones play a critical role in modulating the immune response to peanut* (Mentor – Joseph Dolence)
- 2:30 pm ----- **Hadassha Tofilau:** *The Effect of High Glucose on the Cytotoxicity of the Anticancer Drug Doxorubicin on Breast Cancer Cells and Cardiomyocytes* (Mentor – Surabhi Chandra)

Friday, April 2

Room: CMCT #101

- 8:30 am ----- **Ashley Helfrich:** *Generating Followers: The Effects of Social Media on Modern-Day Political Activism* (Mentor – Satoshi Machida)
- 8:45 am ----- **Samantha Hanks:** *Antigone Now: The Collision of Ancient Greek Theatre and Modern American Perception* (Mentor – Marguerite Tassi)
- 9:00 am ----- **Mackenzie Hamilton** *KSS NE STEM 4U-PA: an after school academic program created to improve knowledge of STEM through physical activity* (Mentor – Megan Adkins)
- 9:15 am ----- **Joshua Wetovick:** *Making Music in Alfred Lord Tennyson's Arthurian Epic, "Idylls of the King"* (Mentor Rebecca Umland)
- 10:00 am --- **Elle Zimniak:** *Exploring the Emotional Effects of Social Support: An Analysis of Online Personal Narratives about Gender & Sexual Identity* (Mentor – Tiffani Luethke)
- 10:30 am --- **Kylie Anderson:** *Reevaluating Diva Citizenship: A Comparison of Womens Voices in the Public Sphere* (Mentor – Maria O'Malley)
- 11:00 am --- **Emma Raders:** *Hybridization of Turkish Salvia* (Mentor – Bryan Drew)
- 11:15 am --- **Alea Reifenrath:** *Percy Bysshe Shelley: A Revisionist of Dante Alighieri* (Mentor – Rebecca Umland)
- 11:30 am --- **Jordan Minnick:** *Assessment of Tick-Borne Pathogens in Central Nebraska (Tri-City Area) in 2019* (Mentor – Julie Shaffer)

- 12:00 pm --- **Elijah Lynch:** *Beatrice and Her Disciples: The Divine Comedy's Influence on Werther's Lotte, Heathcliff's Catherine, and Aschenbach's Tadzio* (Mentor – Rebecca Umland)
- 12:30 pm --- **Lena Janssen:** *Building Mass Functions and Estimating Merger Rates for Calculations of Cosmic Confusion Noise* (Mentor – Joel Berrier)
- 1:00 pm ----- **Shana Schoone:** *One Woman's Story of Survival: A Narrative Investigation* (Mentor – Tiffani Luethke)
- 1:15 pm ----- **Morgan Daubert:** *The Teaching Must Go On: Health and Physical Education Teacher Perceptions of the Impact of COVID-19* (Mentor – Megan Adkins)
- 2:00 pm ----- **Haley Mazour:** *How Would Jesus Vote? Twitter, Religious Rhetoric, and the 2020 Presidential Election* (Mentor – Joan Blauwkamp)
- 2:15 pm ----- **Makenzie Petersen:** *Gender Imbalance in Curricula* (Mentor – Diane Duffin)
- 2:30 pm ----- **Lydia Behnk:** *Democratic Versus Free-Market Ideals in Nebraska Classrooms* (Mentor – Diane Duffin)
- 2:45 pm ----- **Samantha Grieser:** *Comparative Analysis of Party Polarization During the 1993 Health Care Bill and the Affordable Care Act (2009)* (Mentor – Diane Duffin)
- 3:00 pm ----- **Trenton Theis:** *Decreased Tricarboxylic (TCA) Cycle in Staphylococcus Aureus Increases Survival to Innate Immunity* (Mentor – Austin Nuxoll)

Graduate Oral Presentation Abstracts



Biology

McKenna Vininski

Mentor: Joseph Dolence

Title: *Sex hormones play a critical role in modulating the immune response to peanut*

The prevalence of peanut (PN) allergy is increasing rapidly. While PN allergy is a major medical and economic problem, our knowledge of the immunological mechanisms involved in the development of the disease remains limited. Sexual dimorphisms have been observed in allergic asthma and in autoimmune diseases such as systemic lupus erythematosus (SLE). However, how sex hormones regulate the immune pathways that lead to the development of PN allergy is unknown. This study aims to better understand how sex hormones impact the development of allergic responses to PN. Male and female wild type C57Bl/6 mice were sensitized to PN in our established four-week PN inhalation mouse model. Wild type (WT) males had significantly less IgE levels than WT females. When WT male and female C57Bl/6 mice were gonadectomized and implanted with capsules containing opposite sex hormone (e.g. β -estradiol in males and dihydrotestosterone in females), data showed females treated with testosterone displayed reduced allergic reactions to PN. Taken together, this data strongly

suggests that sexual differences exist in the development of PN allergy and furthermore, supports that testosterone plays a role in modulating allergic immune responses to PN.

Hadassha Tofilau

Mentor: Surabhi Chandra

Co-Authors: Santosh Yadav, Paras Kumar Mishra, Surabhi Chandra

Title: *The Effect of High Glucose on the Cytotoxicity of the Anticancer Drug Doxorubicin on Breast Cancer Cells and Cardiomyocytes*

Breast cancer (BC) is the second leading cause of mortality in women worldwide. Studies have indicated that a combination of diabetes and BC, termed diabetic breast cancer, can be lethal and lead to higher mortality than BC alone. Researchers have shown that women who are diagnosed with diabetes, then breast cancer, have a 15-40% increase in the likelihood of mortality due to comorbidity. Doxorubicin (DOX), an anticancer drug, targets the growth of both early (MCF-7 cell line) and late-stage (MDA-MB-231) BC cells. DOX impedes the growth of cancer cells by inhibiting the enzyme topoisomerase which is needed for cell division and growth and has been known to cause oxidative stress on the heart. The effect of diabetes on the anticancer potential of currently approved

compounds is not well researched. Here we hypothesized that the cytotoxicity of DOX is affected by high glucose conditions. For this purpose, we used the MCF-7 BC cell line and the HL-1 cardiac muscle cell line and exposed them to DOX in the presence of different glucose concentrations including normal glucose (5mM) and high glucose (25mM). Cytotoxicity studies were carried out using fluorescent assay methods with PrestoBlue dye. Results indicated that there was no significant effect of high glucose on DOX cytotoxicity in both the MCF-7 cell line and the HL-1 cell line. Future studies will investigate the effects of high glucose on DOX cytotoxicity in DOX-resistant cell lines to determine if anticancer treatment regimen should be altered for diabetic patients with resistant/metastatic cancer.

English

Danielle Williams

Mentor: Megan Hartman
Title: *The Medieval Poet*

Though scholars agree that Old English poetry was at one time performed orally, there is little evidence of it. Overall, the Anglo-Saxon oral poet is somewhat of a mystery, but there are a few sources of representation of the oral alliterative poet. One of the most available sources is, in fact, Old English poetry written in the oral tradition. Scenes and descriptions can be found throughout Old English poetry that offer valuable insight into how the oral poet was perceived by Anglo-Saxon society.

Kiley Anderson

Mentor: Maria O'Malley

Title: *Reevaluating Diva Citizenship: A Comparison of Womens Voices in the Public Sphere*

In her 1997 book *The Queen of America Goes to Washington City: Essays on Sex and Citizenship*, literary scholar Lauren Berlant offers a compelling theory about women's voices in the public sphere that she terms "diva citizenship." Berlant argues that many women's voices in politics have historically been ultimately performative and, while sometimes celebrated in the moment, often yield little-to-no actual change. Berlant's theory on diva citizenship is now almost twenty-five years old, and as such, it is worth reexamining how well it stands. In my presentation, I will contrast Phillis Wheatley's eighteenth-century poetry with current youth poet laurette Amanda Gorman's poem from the 2021 presidential inauguration to fully understand Berlant's perspective and pose possible critiques or alternatives. Phillis Wheatley was one of the most influential poets of the eighteenth century, and in 1773, the Boston Gazette declared her an "extraordinary Poetical genius" when she was just 20 years old. Her poetry involves both celebrations of the emerging United States as well as commentary on slavery. Amanda Gorman, the youngest inaugural poet in U.S. history, is also an activist whose poetry addresses oppression, gender, and race. Wheatley's and Gorman's poetry seems bound up with their performance of it. Moreover, their engagement with politics lends itself to reconsidering the Berlant's concept of

“diva citizenship” and poetry’s place in the public sphere.

History

Trevor Rhodes

Mentor: Douglas Biggs

Title: *A Race of Headsmen - The Life and Mind of a Dynasty of French Executioners, 1688-1847*

The role of a headsman in early modern France was that of executioner, torturer, magistrate, and custodian. They functioned uniformly as an arm of the state, a public entertainer, and a religious intermediary. They were ostracized by their communities, and lacked the legal rights of French citizens. Coupled with their dangerous profession, many described the executioner’s life as stressful, lonely, and melancholic. This project examines the memoirs, letters, public records, and legal records of the Sanson dynasty of executioners to understand the patterns of thought and behavior of the early modern headsman. While recent historians have acknowledged the social and political pressures of the profession, few have attempted to catalog the words and actions of the executioners themselves. The Sanson family is unique in their longevity and historical role in the French Revolution. Furthermore, their memoirs provide in their own words a direct understanding of their state of mind. This project charts the rise and fall of the Sanson dynasty over seven generations from 1688-1847. It highlights the patterns of nervous breakdowns and depression

caused by mental trauma unique to the profession. Members of the family worked to reform the penal code to restore their citizenship, pushed for the adoption of the guillotine to ease their workload and expenses, and wrote editorials to turn public perception of their profession from revulsion to respect. In highlighting the plight of the French headsman, this project underscores the singular difficulties of a profession hitherto misunderstood by contemporary society.

Braydon Conell

Mentor: Linda Van Ingen

Title: *Community Activation: Response to AIDS in Chicago*

The response to the AIDS epidemic in Chicago shows continuity with the national trend of fighting ignorance. In the 1980s, Chicago emerged as a hotspot of gay life, positioned between watershed moments in New York and San Francisco, crafting an opportunity to forge a powerful, accepting community within the city through community responsiveness, educational initiatives and political activism. Chicago is more representative of the typical American city and is why this study is centered here. Chicagoans provided their own actions in response to city and county government inaction. Medical activism by gay doctors at the Cook County Hospital, for example, helped spur treatment availability. Gay spacial concentration increased community support but did not address resource inequality. AIDS education in Chicago also took a new path. Education – sex positive versus sex adverse – was present throughout the city, yet racial differences were again present. The most

important sources for this paper were primary accounts from both inside and outside the LGBTQ+ community during the 1980s and more recently. Including material from within the community clarifies how the community operated even if mainstream media was not covering it. The AIDS epidemic and the reaction from the LGBTQ+ community proved the group was resilient, united and visible, an important foundation for facing continued discrimination and oppression from groups such as the conservative Christian right. Despite challenges, the 1980s was a period of change in LGBTQ+ history that ushered in opportunity and acceptance for future generations of LGBTQ+ youth in the United States.

strategies. Since 2018, UNK students have helped create the curriculum, and taught the program at elementary and middle schools on a weekly basis, through faculty mentorship. Due to COVID-10 school restrictions, community partners are not able to attend after school programs. The KSS STEM 4U-PA faculty and students created a curriculum to continue to teach STEM with physical activity but designed for facilitation and learning taught by the after-school program staff. Herein, we describe the model of this program as documented by demonstrated successes to date in an effort to guide others in developing such a model in their after-school programming.

Kinesiology & Sports Sciences

Mackenzie Hamilton

Mentor: Megan Adkins

Title: *KSS NE STEM 4U-PA: an after school academic program created to improve knowledge of STEM through physical activity*

The kinesiology and Sport Science-Nebraska Science, Technology, Engineering, and Mathematics 4U Physical Activity (NE STEM 4U-PA) is an after-school program designed to teach science, technology, engineering, and mathematics (STEM), as well as learn about future careers related to STEM. The program intertwines physical activity to learn STEM concepts while implementing problem-based learning

Undergraduate Poster Abstracts



Fine Arts & Humanities

Communication

Poster U01 – Madison Dimmitt

Mentor: Sonja Bickford

Title: *Understanding the Effectiveness of Project Resource Management Software*

Project management is a process and theory that is utilized by numerous industries and fields for the purpose for carrying out project management plans. Many fields such as construction, engineering, and communications / public relations work with projects. Thus, understanding project scheduling procedures and what is used in practice by various industry professionals is of interest. Due to this trans industry aspect of project management this project in advertising communication aims to answer questions via an online survey about what type of project resource allocation, scheduling methods, and software tools (if any) are actually used in practice and in which industries to identify a target market. In addition, the project aims to answer questions about what product and service information is important and relevant to which target audiences when formulating an

advertising campaign for project resource management software. The intent of this brief research study conducted via an online Qualtrics survey, upon IRB approval, is to gain a firsthand perspective of a variety of ways and situations that a real world product can be utilized in different industries. Additionally, this research and information could aid a communication professional, to formulate advertising campaigns based on this insight.

Modern Languages

Poster U02 – Laura Ibarra Arreguin

Mentor: Janet Eckerson

Title: *Student perspectives on Heritage Language instruction at UNK*

It is widely acknowledged that the instructional needs of heritage language learners (HLLs) differ significantly from those of traditional second language learners and thus the aims of instruction designed to serve them should vary as well (Martínez, 2016). HLLs are those students who acquired a language other than the majority at home and are to some degree bilingual in the heritage language and the majority language. The University of Nebraska-Kearney, like many institutions serving a growing number of Latino students with Spanish

language proficiency, now offers Spanish courses specifically designed for Spanish heritage language learners (SHLs). This study seeks to examine how well these courses for SHLs align with students' own goals for language study. As the number of SHLs studying Spanish in the UNK department of Modern Languages grows, it is important to reflect on the approach taken to serve them. Curriculum in SHL courses should reflect the needs of the particular student population, not just "learner's linguistic and pedagogical needs, but also their interests and motivations for learning the HLL" (Beaudrie, 2016, p. 85). This poster presents and analyzes the questionnaire responses of five heritage language learners in UNK SHL courses in relationship to these research questions: To what degree are the HLLs studying Spanish at UNK similar to HLLs elsewhere? What goals do these students have for their study of Spanish? Some implications of these preliminary findings relate to the design of courses in the Department of Modern Languages.

Music, Theatre, & Dance

Poster U03 – Micah Sessions

Mentor: Andrew White

Title: *A Purposeful Life*

Micah designed and performed a philosophically inspired vocal recital comprised of 11 accompanied vocal solos all originally written by Steven Curtis Chapman. The songs were chosen and ordered based on a fictional story of life

that is designed to relate to audiences of varying ages. The songs focus on common emotional transitions that humans go through at different points in their lives. The vocal selections include songs such as: "More to This Life," "The Great Adventure," "No Better Place," and "With Hope." In between each song Micah takes a musical break to speak to the meaning of each song in relation to the story of life that he is telling.

Poster U04 – Rochelle Hazelton

Mentor: Anne Foradori

Title: *Trouser Roles in Nineteenth Century French Opera*

The tradition of "trouser roles" in opera dates back to the Baroque period, when composers such as G.F. Handel wrote several roles depicting youthful men first sung by castrati, and then by women en travesti ("in disguise").

During the 18th century, W.A. Mozart composed some nine male roles to be sung by women. As the castrato voice fell out of fashion, composers of the Classical and early Romantic periods often turned to women to play the roles of boys or to distinguish very young men from older ones on stage. This became increasingly popular with bel canto composers Bellini, Rossini, and Donizetti who often cast a mezzo-soprano playing a male role with a soprano singing the female protagonist, as in Bellini's *I Capuleti e I Montecchi*, in which the roles of Romeo and Juliet are both sung by women.

The 19th century opera "trouser roles" for women often included the roles of pages:

Siebel (Faust), Stefano (Roméo et Juliette), Amoroso (Le pont des soupirs) and Urbain (Les Huguenots). Mezzo-sopranos also depict roles adult men: Le Prince Charmant (Cendrillon), and Nicklausse (The Tales of Hoffmann)

Nineteenth century French opera composers were especially drawn to writing for women en travesti as the composers both appreciated and promoted the broad definition of gender identity espoused by their worldly Parisian audiences. French composers wrote twenty-some “trouser roles” for women during the 19th century. This presentation examines the history, general dramatic characteristics, and musical considerations of specific operas and roles in this repertoire.

Poster U05 – Terran Homburg

Mentor: Sharon Campbell

Title: *The Goddess Isis in Song*

The Goddess Isis in Song is the culmination of three years of study of Egyptian myth. In the cyclic timeline presented within Egyptian myth, Isis is a central figure. By following several timelines and retellings of Egyptian myths, I found in Isis a woman who has played many roles in her character’s arc. She has been portrayed as a mere human, a devout wife, a mother to gods and kings, a fierce warrior bent on revenge, and finally the all-powerful supreme sorceress and creator goddess.

In the Egyptian mythical canon, Isis is considered to be the mother of music. Therefore, I found a song cycle to be the

perfect medium with which to portray her story. The Goddess Isis in Song is a five movement song cycle which follows different aspects of Isis’ character journey. Within this song cycle, I use E.A. Wallis Budge’s translation of various Egyptian texts as well as my own poetry as a libretto for my compositions. This song cycle utilizes the colors and timbre of the female voice to pay tribute to the various goddesses Isis is conflated with throughout her timeline. The original staged work The Goddess Isis in Song will be livestreamed in late April. My poster today details the compositional process behind bringing this song cycle to life.

Poster U06 – Emma Newman

Mentor: Noelle Bohaty

Title: *Intimacy Practices for Collegiate Theatre*

While participating in this undergraduate research project, Newman has been required to accomplish many different tasks. The first includes the initial research. This includes, but is not limited to, learning the advantages of using proper intimacy protocol and speaking with known intimacy coordinators, directors, and choreographers. Secondly, she will do hands on research with her position of intimacy coordinator for the Theatre Department’s production of *Life is a Dream* directed by Billy Deardoff. As Intimacy Coordinator, she will work with the Director and the Actors involved to create activities, choreography, and preshow and post show exercises that the actors can comfortably execute. These

activities and exercise create safe environment while creating lines of open communication between both the cast, stage management team, and director. Which in return, leads to consensual practice when dealing with intimate scenes of a play. Finally, she will relay her information and recommended practices with the faculty of the University of Nebraska at Kearney Theatre Department. In this project, Newman will be required to gain information from a multitude of different people as well as efficiently relay this information to others in real life applications.

Poster U07 – Zachary Petry

Mentor: Del DeLorm

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

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

bystander explaining the action. Choruses certainly continue to follow these established models. This project aims to find and analyze examples of these models.

Behavioral & Social Sciences

Criminal Justice

Poster U08 – Rachel Higgins

Co-Mentors: Kyle Harshbarger and Julia Newton Campbell

Title: *Impacts of Colorado's Marijuana Legalization on Police Officers' Activities in Nebraska*

This research will examine the effects that the legalization of marijuana in Colorado has had on Nebraska. Interstate 80 is a highway that extends from the west coast to the east coast and is used as a major drug trafficking route. Policing along Interstate 80 in Nebraska has been impacted in many ways by the legalization of marijuana in Colorado. Qualitatively measuring certified law enforcement officers that work along Interstate 80 in Nebraska, will help to understand the impact that Colorado's legalization of marijuana has had on policing activities in Nebraska.

Geography

Poster U09 – Justin Vrooman

Mentor: Paul Burger and Jason Combs

Co-Authors: Austin Glause, Jason Combs

Title: *Market Area Delineation of a Pediatric Weight Management Program in Kearney, Nebraska Through GIScience*

What is the geographic extent of the market area for the pediatric weight management program in Phase 1 of the Building Healthy Families (BHF) pilot program in Kearney, Nebraska? Participants are geocoded and network analysis is used to determine the travel times and geographic extents of the primary and secondary market areas. Using ArcGIS' Closest Facility analysis from each participant to the Kearney site, we determine the network distance of the Core (Primary) and Secondary (Tertiary) market areas (MA) using travel time at which 80 and 92 percent of participants respectively are located. ArcGIS' Service Area is then used to delineate the geographic extent along the network of both market areas. Census block population estimates for 2019 extrapolated from block groups are used to calculate the potential population served. Market area threshold distances for Kearney's existing BHF site are used to calibrate the market areas for eight sites in Phase 2 of the BHF project.

Poster U10 – Tate Combs

Mentor: Paul Burger and Jason Combs

Co-Authors: Austin Glause, Jason Combs

Title: *Leaves From my Journal William T. Beattys Account of His Time in the 2nd Ohio Volunteer Infantry*

During the Civil War, the Ohio Valley played an essential role in the eventual Union victory. At the start of the war, Ohio had the third largest state population (2,339,511) and ranked third in wealth. In the 1850s and 1860s, Ohio also

contained many of the nation's largest cities—Cincinnati, Cleveland, Columbus, and Dayton were all in the top fifty largest cities in 1860. Geographically, the state was centrally located in the heart of the country, connected to the Ohio and Mississippi rivers, and Ohio led the nation in railroad track mileage as well. A total of 313,180 Ohioans served in 198 infantry regiments and 13 cavalry regiments, in addition to several artillery regiments and various independent units. Ohio most likely led the northern states in the percentage of its eligible men serving in military forces and one such Ohio soldier was William Beatty, a member of the 2nd Ohio Volunteer Infantry. Beatty, at the age of forty-three, joined the 2nd Ohio Volunteer Infantry, Company C, on July 27, 1861 at the rank of Captain. Beatty served in that capacity until March 2, 1863, when he was promoted to Major and became a member of the Field and Staff Officers for the 2nd Ohio Volunteer Infantry. During his time in service, Beatty kept a journal and meticulously recorded dates and key events. This project uses his journal to share his story.

Poster U11 – Austin Glause

Mentor: Paul Burger

Co-Author: Justin Vrooman

Title: *Using GIScience to Understand Service Area Accessibility of Pediatric Weight Management Programs in Nebraskas Rural and Micropolitan Communities*

This project uses data from a related market area delineation project to determine the geographic extent of the

catchment areas from each of the eight approved future pediatric weight management program sites, known as Building Healthy Families (BHF), in Nebraska. U.S. Census Bureau Core Based Statistical Area (CBSA) definitions for metropolitan (MSA) and micropolitan (mSA), counties are used to classify census blocks throughout the state with those blocks falling outside of a CBSA categorized as rural. Service areas are calculated in GIScience across the road networks using travel time from each program to its respective participants to determine the geographic extent of each catchment area (Burger et al. 2015). The geographic size, average distance traveled and number of participants in each non-overlapping service area (break-point method) are compared. Values are analyzed to discern whether potential differences in program accessibility or usage exist in Nebraska between metropolitan, micropolitan, and rural areas (Combs et al. 2019).

Poster U12 – Payton Livengood

Mentor: Vijendra Boken

Title: *An analysis of the flood of July 2019 that occurred in Kearney, Nebraska*

An unusual flood occurred in Kearney on July 9, 2019. A thunderstorm dump on July 8, 2019 raised water levels quickly in the Wood River and flooded certain areas in Kearney. Many people were evacuated, and the flood caught the city off guard. Many businesses and private homes in the city were badly affected and suffered heavy economic losses. In the present study, the data on the Wood

River discharge were collected for a historical period and analyzed to determine flood frequencies and the return periods. The 2019 flood is analyzed in the context of the flood characteristics of the Wood River and measures discussed to prevent such floods in the future.

Political Science

Poster U13 – Tanner Butler

Mentor: Satoshi Machida

Title: *Effects of an Individuals*

Polarization on their likeliness to Believe Fake News

This study is looking at how an individual's political polarization affects their likeliness to believe fake news. Putting it in simpler terms, how extreme political beliefs make them more likely to believe fake news stories. I predicted that more extreme beliefs that one has will make them more likely to believe fake news that will confirm their beliefs. The method for studying this was to do a survey experiment when the participants define their political beliefs. They were then exposed to either fake or real news that is conservative, liberal, or non-political. The results of this study are not in so no conclusions can be drawn yet.

Poster U14 – Steven Hinze

Mentor: Satoshi Machida

Title: *How Long Can North Korea Remain Isolated?*

The Democratic People's Republic of Korea, commonly known as North Korea is an isolated independent state on the Korean Peninsula. It is one of the last communist nations in the world. The DPRK has frequently been in the news for nuclear weapons tests, human rights abuses, and famine of the states citizens. Because of these reasons sanctions, from states globally have choked the DPRK. The outdated communist system and sanction begs the question of how much longer the DPRK can remain as an isolationist state?

Poster U15 – Adrian Gomez Ramos

Mentor: Peter Longo

Title: *An Alternative to Welfare: Protect the Earned Income Tax Credit (EITC)*

The Earned Income Tax Credit (EITC) serves as a tax break for working class Americans at low to moderate incomes and is administered by the Internal Revenue Service (IRS), an agency bureau under the Department of the Treasury (Internal Revenue Service, 2020). The IRS is charged with enforcing the federal tax code as well as collecting taxes. As a program, the EITC has assisted families with children by reducing taxes owed and providing cash refunds when families file their taxes. The EITC is a proven means of improving the economic, health, and educational outcomes of families receiving the credit.

This tax credit is designed to assist needy families by lowering the amount of taxes owed to where the federal government (and in some instances, state

governments) covers taxes owed and offers a direct cash rebate to the families. The scope of this policy is limited only for those low to moderate income families, especially those with children. On the other hand, the magnitude of this benefit is expansive because it reaches the areas of economics, health, and education. In short, the EITC accomplishes more than its intended goals and addresses key national issues spanning from economics to education. The tax credit should be protected to ensure low to moderate income families continue to have access to this crucial benefit.

Poster U16 – Jade Vak

Mentors: Peter Longo

Title: *Economic Barriers to Rural Nebraska Healthcare*

There are economic barriers to rural Nebraska healthcare and the impact affects nearly every Nebraskan. Data and reports indicated that more and more health care providers are having to leave rural Nebraska. There are numerous reasons as to why, but it appears that financial issues are the greatest factor. This study aims to establish the connection between economic policies and healthcare (quality and accessibility). Specifically, this study investigates how the economy is affecting the quality of rural Nebraskan's health currently and for generations to come.

Poster U17 – Earlen Gutierrez

Mentor: Peter Longo

Title: *Race, the War on Drugs, and the Wrongly Convicted*

The rapid rate at which black men are being incarcerated at has contributed to societal stigmas and the push for the war on drugs. The prevailing reason for this is exploitation of urban communities and lower-income Black Americans. The unjust convictions on drug possession varies from race to race. The drugs marketed towards black communities will almost always result in harsher sentencing for a lesser amount. I have used various works of research by those who have dedicated time and effort to the social sciences to further connect race and drug use to mass incarceration. Contrary to what many may believe, sending citizens, especially black men to jail, for petty crimes and insignificant amounts of drugs can cause devastating changes to a once harmonious community.

Poster U18 – Emily Saadi

Mentor: Chuck Rowling

Title: *Human Rights Violations of the Israeli-Palestinian Conflict*

Throughout the duration of the Israeli-Palestinian conflict, there have been numerous documentable human rights violations from both involved parties. International institutions have an obligation to not only respond, but to react to these human rights violations in order to protect the rights of the members of the global community. This study aims to first, identify and report in a consolidated space the human rights violations that have occurred within this conflict, specifically through the Israeli occupation of the West Bank and Gaza. The study

then examines how the international community and international institutions, particularly the United Nations, has reacted and responded to the reports of these violations; as well as how these institutions have either upheld or ignored previous declarations and decisions regarding not only the conflict itself but also human rights as an institution of international law. Finally, the study aims to identify concrete steps that the international community and international institutions could take in order to more effectively approach the situation moving forward and attain justice for those whose human rights have been violated. This study is crucial because of the severity of these violations against human rights and the neglect of the international community as a whole to address them in any substantial way.

Poster U19 – Jake Ellis

Mentor: Peter Longo

Title: *Social Capital and History of Golf in America*

My research project revolves around both the history of American Golf, as well as the Social aspect of the sport. I highlight much of the early history of golf in the country, beginning in the late 1800s. Immigrants from Scotland often came over and designed many of the early golf courses specifically in the Northeastern part of the country. Much like the transition of emigration within the country, courses quickly started migrating towards the South and westward. Quickly the sport would be all across the country. From The Country Club in Brookline, MA,

to Pebble Beach in California golf had become widespread throughout the nation. Socially, country clubs created a wealth divide. Naturally the sport has always been quite expensive and furthered this social divide. In more recent decades, public golf courses have exploded throughout the nation, much attributed to the golf boom directly caused by Tiger Woods. This has given people from all economic backgrounds to participate in the sport. Lastly, I focus on the impact and growth of the sport directly in Nebraska and highlight some of the communities that have grown due to the sport of golf.

Poster U20 - Caleb Hendrickson

Mentor: Peter Longo

Title: *Two Weeks to Flatten the Curve to Most Deadly Pandemic in a Century": How COVID-19 Shaped the 2020 Election*

Voting is a way that citizens of this country are able to express their view, thoughts, and perspectives on policy & policymakers across the country. In this current system, our voter turnouts have been healthy but there is a growing movement involving opening voting to more Americans, just as there is a movement growing against precisely that. The pandemic that is COVID-19 opened several doors for different types of voting across the country, and these types may worm their way into the constructivist norms that play a role in dictating public policy. How voting compared to the Spanish Flu or other crises in American history will be covered in this paper;

additionally more progressive solutions for crisis voting will be examined.

Poster U21 – Tanya Machamire

Mentors: William Aviles

Title: *Why Does Zimbabwe Experience More Corruption Than Botswana Despite The Similarities*

I was born and raised in Zimbabwe, from my life experience I understood that Zimbabwe breeds huge amounts of corruption. However, our neighboring country 'Botswana' is pretty much similar to Zimbabwe but yet they performed better and still continue to perform at its best. It has always been my concern to figure out why it is, the way it is, therefore the purpose of my research is to analyze these two countries in terms of the factors that affect the level of corruption in each country and try to come up with an answer as to why Zimbabwe tends to suffer more corruption. It is my expectation that the differences in the levels of corruption reflect long-standing differences in political institutions and the greater power of patrimonialism within Zimbabwe compared to Botswana.

Psychology

Poster U22 – Gabe Macfee

Mentors: Katherine Moen

Title: *The Relationship Between Difficulty and Performance in Visual Search Tasks*

The purpose of the current study was to examine whether there was a relationship

between perceived task difficulty and actual task difficulty. Participants were given instructions for a visual search task, and were asked to rate how well they believed they would perform on the task. They were then told the task would be very hard (easy), and were asked to rate their confidence again. Results revealed that manipulating perceived difficulty impacted perceptions of task difficulty, but did not impact visual search performance. Confidence was impacted by perceived difficulty, but only for the actually easy task.

Poster U23 – Nate Grimm

Mentor: Krista Fritson

Title: *Exploring Mental Health Needs of University Student Athletes During COVID-19*

The COVID-19 pandemic has had a tremendous effect on the world of athletics. Factors like strict health measures and protocols, social isolation, and uncertainties about the future could affect an athlete's overall wellbeing and performance. This study explores the effects that the COVID-19 pandemic has had on student-athletes at a D-2 university in the Midwest. Some specific areas that this study will look at include changes in anxiety, depression, reactions to playing sports, and COVID-19 influences as the pandemic restrictions are lifted. This study also compares these variables between athletes who have worked with a team psychologist and athletes who have not. Student-athletes are already exposed to many stressors as they juggle academics and performing at

their highest level in their sport. The COVID-19 pandemic only adds to the issues these athletes face, so observing the effects of the pandemic on their wellbeing will assist professionals in developing helpful strategies to boost mental wellbeing and performance.

Poster U24 – Josie Koubek

Mentor: Christopher Waples

Title: *A Performance Appraisal Process Revision for Local Manufacturing Company*

Performance appraisals are an essential component of employee development and perform a crucial role in human resource decision-making. Evidence shows that implementing the best practices for the appraisal process improves performance and leads to higher employee satisfaction (DeNisi & Pritchard, 2006). Employees' performance is a crucial piece to any organization's success. The field of manufacturing, specifically, requires a flexible appraisal process that can measure performance across various tasks (e.g., in teamwork, job rotation; Bayo-Moriones et al., 2019). The current research project examined and revised a local manufacturing plant's performance appraisal. The project entailed a pre-survey to measure employee satisfaction with their current appraisal. During the first round of collection, a focus group was held to gain additional insight into the manufacturing plant's existing process. The focus group was composed of supervisors for various levels of the organization. Following the focus group, the necessary revisions were explored.

The appraisal document was then redesigned to include behaviorally-based anchored rating scales, a greater emphasis on employee development, and adjustments to rating topics. The new document was then implemented at the organization, which included training on the new form. After implementation, we again surveyed employees to assess their satisfaction with the revised instrument. Appraisal revisions and their preliminary impact on stakeholder satisfaction will be discussed.

Poster U25 – Abigail Borgman

Mentor: Krista Fritson

Title: *Effects of Essential Oils on Anxiety and Mood*

The use of aroma therapy and essential oils is growing in popularity, and there are claims that lavender essential oils hold benefits of reducing anxiety, depression, and insomnia (Nordvist, 2018). Essential oils are regarded by some to “cure” numerous psychological issues, but do these oils pose a real benefit or are they just another wellness marketing ploy?

The purpose of my research is to expand on the knowledge surrounding the use of essential oils and their possible effects on anxiety and mood. My research includes college age individuals at a Midwestern university. An ANOVA is used to analyze the data.

Social Work

Poster U26 – Samiya Alexander

Mentor: Toni Hill

Title: *The Color of Stress: Impact of Students of Color Attending Predominately White Institutions*

This presentation will focus on stress and other factors related to students of color attending predominately white institutions (PWIs) of higher learning. Using literature reviews and secondary data, factors related to student recruitment, retention, and graduation will be examined in relation to racial and ethnic-specific stress. Students of color may not fit it, may experience culture shock, or not have the internal or external resources to adapt comfortably at a PWI. Research has shown a multi-faceted approach is needed for students of color to be successful at PWIs (Eakins & Eakins, 2017).

Poster U27 – Dylan Lemke

Mentor: Christina Sogar

Title: *The Number of Gay-Straight Alliance Student Organizations in Nebraska Public High Schools and its Support for LGBTQ+ Students*

A student's sense of safety and acceptance plays a crucial role in their level of success. Research indicates that Lesbian, Gay, Bisexual, Transgender, Queer+ (LGBTQ+) youth are more frequently victimized at school than their heterosexual peers (De Pedro et al., 2018). According to the GSA Network, Gay-Straight Alliance (GSA) clubs are

student-led school organizations that encourage an inclusive and accepting school environment for LGBTQ+ youth. The inclusion of GSA clubs in schools has been shown to decrease the rates of victimization on LGBTQ+ youth (Marx & Kettrey, 2016). Most studies on GSA organizations have been conducted in liberal urban states. Although significant, these studies highlight the need for more research on the effectiveness of GSA clubs in rural conservative areas such as Nebraska public high schools. For this research project, we are surveying 285 Nebraska public high schools. This survey will be sent to these high school principals to question if their schools have a GSA. If the principal were to answer yes to having a GSA, they are followed up by a list of questions to further examine the effect that that GSA plays in supporting its LGBTQ+ students. If the principal were to answer no, they will be followed up with alternative questions that will provide a clearer understanding as to why the school does not have a GSA. This information, along with the demographics anonymously provided by the principals, will provide valuable information on the level of support Nebraska public high schools have for their LGBTQ+ students.

Sociology

Poster U28 – Darienne Blair

Mentor: Richard Mocarski

Title: *An analysis of human trafficking education materials for healthcare professionals*

The US Department of State defines human trafficking as “the recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery.” This can be broken down into different types of trafficking: sex trafficking, child sex trafficking, labor trafficking/forced labor, debt bondage, domestic servitude, child soldiering, organ trafficking, and child marriage. Human trafficking has largely been considered a criminal justice issue; however, in recent years, human trafficking has emerged as a public health issues that health professionals play a key role in identification, recovery, and prevention. The International Labor Organization estimates that 40.3 million people are currently victims of human trafficking, more than at any other point in human history.

In 2013, a study published in the American Journal of Preventative Medicine used an in-depth Google search to identify human trafficking education materials for healthcare professional. The results of this study showed that there was very little information on human trafficking available for health care

professionals. After nearly a decade, we have learned much more about human trafficking and how to care for those affected. This study replicated the 2013 study. Using an in-depth google search, there was 31 different educational materials identified from the years 2015-2020. The results of this study showed that there has been little updates to the human trafficking educational material or health care professionals in the last 10 years. Health care providers still lack access to accurate, evidence-based, high quality education on human trafficking.

Natural & Physical Sciences

Biology

Poster U29 – Zach Carter

Mentor: Brian Peterson

Co-Authors: Kimberly Carlson, Casey Schoenebeck, Brandon Luedtke

Title: Establishing genetic protocols to confirm individuality in subsequent years of white-tailed deer cast antlers

Antlers are perennial paired appendages that are cast annually and generally increase in size by age. Cast antlers can be used to compare antler size between populations, assess management strategies, and evaluate deer health. Confirming subsequent antlers from the same individual year to year can be challenging as morphological characteristics change with age. Prior to determining the best antler metric it's important to determine individual deer's antler year to year and genetic confirmation must first be established. The primary objectives of this study were to 1) Establish genetic protocols to harvest DNA from cast antlers and 2) Determine individuality from subsequent years. Individuality will confirm genetic individuals using the hypervariable 699 d-loop base pair portion of the mtDNA region. We also have successfully extracted DNA, PCR amplified the mtDNA target, and are currently batching samples to be sent off for DNA sequencing. Obtaining the DNA

sequences will confirm individuality from subsequent years and provide wildlife biologists a better understanding of the populations they manage.

Poster U30 – Emma Collins

Mentor: Kimberly Carlson

Co-Authors: Joseph Dolence, Kimberly Carlson

Title: Development of a Peanut Allergy Model using Drosophila melanogaster

Peanut (PN) allergy is a very common and often life-threatening food allergy in the United States. Mice are traditionally used to study PN allergy, but this can be expensive and time-consuming. *Drosophila melanogaster*, on the other hand, have proven useful to study human diseases and disorders due to their similar genome while eliminating the issues encountered using mice. Furthermore, observation of response to PN in *D. melanogaster* would suggest that the ability to mount allergic immune response is encoded earlier in evolutionary history than previously thought. For these reasons and due to the ease of use and manipulation, *D. melanogaster* were chosen as the organism in which to develop a model of the PN allergy. Two conditions were tested, the control (5% sucrose) and the experimental to induce PN allergy (5% sucrose + 5% peanut powder). Fifty virgin WitiRelE23 females each were put into six pint cages (3 for 5% sucrose and 3 for 5% sucrose + 5% PN). Every 24 hours for 3 days, the treatments were replaced with fresh solution, dead flies collected, counted and frozen. At the end of the 3-day treatment period, the live flies remaining in the cages were collected,

counted, and frozen. All samples will be used to perform RNA and protein analyses to determine if an allergic response was induced. For RNA analysis, qRT-PCR will be performed and for protein analysis, Western blot will be conducted. Both analyses will test for differential regulation of the RP49 (endogenous control for qRT-PCR), GADPH (endogenous control for Western blot), Cactus, Relish, and Dif genes. These are immune response genes that have homologs in humans that are shown to be activated during an allergic response. If there is an upregulation of the mRNA and protein from these genes, this will be the initial description of a model of PN allergy in *D. melanogaster*. The project described was supported by grants from the National Center for Research Resources (5P20RR016469) and the National Institute for General Medical Science (8P20GM103427), a component of the National Institutes of Health.

Poster U31 – Michaela Walker

Mentor: Surabhi Chandra

Co-Authors: Wuilian Martinez, Mahesh Pattabiraman

Title: *Anti-Cancerous Effects of Mononaphthyl truxillate on Prostate Cancer Cells*

Subsequent to heart disease, cancer is the second leading cause of death in the United States. More than one-fifth of the deaths in the United States are due to cancer. That is nearly 600,000 deaths per year. Fatty acid binding proteins (FABPs) have recently been investigated as a possible drug target to treat cancer because of their role in the malignant progression of cancer cells. It has been shown that

some cancer cells, namely prostate cancer cells, exhibit increased levels of FABPs. A recent study has shown that SBF126 (α -truxillic acid 1-naphthyl monoester) targets FABPs and inhibits the FABP5-PPAR γ -VEGF signaling pathway. We hypothesized that a similar compound to SBF126, mononaphthyl truxillate, would have a cytotoxic and antimetastatic effect on prostate cancer cells. For this study, we used PC3 (metastatic prostate cancer) cells to investigate the anticancer potential of mononaphthyl truxillate. We also performed migration assays to analyze the migratory response of PC3 cells after treatment with this compound. Our results show cytotoxic effects of mononaphthyl truxillate at microM concentrations when cells were treated for 48h. Migration assay using scratch wound healing technique showed lack of covering of scratch using microM concentrations of mononaphthyl truxillate when compared to control. This assay is an indirect measurement of metastasis of cells. Thus far, we can conclude that at microM concentrations mononaphthyl truxillate could be a viable prostate cancer treatment option by causing toxicity and preventing matastasis.

Poster U32 –Ty Masco

Mentor: Gregory Pec

Co-Authors: Shaylee Johnson, Jalynn Ellenwood

Title: *The Effect of Prescribed Fire and Grazing on Grass Forage Value*

The occurrence of fire (e.g., natural and prescribed) and grazing have long been associated with prairie ecosystems. Fire and grazing are pivotal to maintaining

diverse and resilient plant communities. Although numerous studies have evaluated the impacts of prescribed fire and grazing on prairie systems, less is known about the specific effect that prescribed fire and grazing have on grass forage value - an important component to the maintenance of livestock and wildlife production. To address this question, we investigated how prescribed fire and grazing affects the dry matter content and crude protein of grasses in a reestablished prairie ecosystem. We predicted that both dry matter content and crude protein levels of grasses following recent prescribed fire should be higher due to increased plant growth and soil nutrients. We also predicted that grazing would increase the crude protein levels in grasses. Samples were taken from four areas that were under varying conditions of fire and grazing exposure. Grass samples were dried, ground, and tested for dry matter content and total nitrogen content using a persulfate digestion method. Following this process, crude protein levels were calculated from total nitrogen content. Our results indicate that burning had a greater effect than grazing on both dry matter content and crude protein levels of grasses. This supports our first hypothesis that forage quality would be higher with recent fire disturbance. Whereas our prediction that grazing would result in higher crude protein in grasses was not supported. Our results also indicate that crude protein levels decline since time of last fire occurrence. Overall, we show that prescribed fire can increase the forage value of grasses in prairie systems. Further research on this topic should look at fire events in successive years to determine how long the effects of

prescribed fire can be beneficial in increasing grass forage value.

Poster U33 – Tyler Shaner

Mentor: Joseph Dolence

Co-Authors: McKenna Vininski, Joseph Dolence

Title: *Dendritic cells display sex-specific differences in ability to mount immune response to peanut*

The mechanism of how peanut (PN) initiates immune responses to elicit PN allergy remains limited. PN is commonly found in household dust and we have shown that PN exposure via inhalation sensitizes mice. Little is known about how dendritic cells (DCs), a type of immune cell critical to initiate adaptive immune responses, function in response to airway exposure to PN. Even more unclear is how sex differences impact the DCs ability to respond to PN. This study compared male and female mice exposed to PN in 3-day mouse models to elucidate how sex differences impacted the response of DCs to PN. To study, lung draining lymph nodes (dLN) were collected from BALB/c male and female mice after exposure to PN flour by inhalation three times during a 3-day period (days 0,1,2). Single cell suspensions were stained with antibodies to identify DC-specific responses to PN by flow cytometry. We started by examining DCs more broadly using the classic CD11c DC stain before zeroing in on whether differences existed in different CD11c+ subsets, namely CD103+ and CD103- DCs, two DCs that have been implicated in capturing PN to mount PN-specific responses. Interestingly, both CD11c+ and CD103+ DCs were reduced

in male mice exposed to PN when compared to their female PN-exposed counterparts. These results strongly suggest that testosterone modulates immune responses against PN exposure. Future studies will build on this fascinating data to allow us to better understand sex differences associated with PN allergy.

Poster U34 – Gabrielle Buttermore

Mentor: Letty Reichart

Title: *Exploring demography for migratory Baltimore Orioles in south-central Nebraska*

Habitat loss has likely contributed to population decline in many migratory songbird species. Studies of population demography for sub-populations of species can allow us to estimate current population size and future reproductive potential given age classes observed within populations. For this project, we studied a population of migratory Baltimore Orioles (BAOR) that stop over along the Platte River in south central Nebraska each year. During May of 2015-2019, individual BAOR were trapped during migration. Each year we recorded age class, gender, and morphological traits including: body weight, tarsus length, and wing chord length. We describe the BAOR population that annually stops in south central Nebraska during migration, and provide preliminary predictions for future population change for this sub-population of BAOR.

Poster U35 – Zane Carlson

Mentor: Joseph Dolence

Title: *Development of Vaping Model Using Human Alveolar Lung Cells*

Vaping has become incredibly popular as a new smoking alternative over the past five years. Concerns over the safety of vaping has grown after recent cases of vaping-related severe lung disease. The effect of vaping on lung cells remains poorly understood. Therefore, we used a human alveolar lung cell line (A549 cells) as an in vitro model to test whether the presence of vape juice itself or the concentration of nicotine within the vape juice influenced cytotoxicity. A549 cells were plated into 12-well plates that were treated with vape juice containing either 0, 3, 6, or 12 mg/mL nicotine. After 24 hours of exposure, the cells were visualize using a microscope and pictures taken using the Bio-Rad Zoe Imager. The results of this preliminary study were striking – exposure to vape juice containing the higher nicotine concentrations (6 and 12 mg/mL) showed visually marked cell death compared to exposure with the no or lower nicotine concentration (3 mg/mL) vape juice. Due to this initial analysis, a quantitative cell cytotoxicity analysis will be conducted using flow cytometry by staining the A549 cells with a Zombie Violet live-dead cell dye to better understand how exposure to different vape juices promotes lung cell death. Future studies will use cell media conditioned with vape mist itself to simulate more physiologically relevant exposure to vape juice. Overall, we hope to understand how vaping impacts lung tissue by first understanding whether nicotine itself or other substances within the vape liquid is causing cell death.

Poster U36 – Nicole Mittman

Mentor: Keith Geluso

Co-Author: Phoebe Dunbar

Title: *Impact of Weather on Foraging Behavior of Sandhill Cranes During Spring Migration*

Each spring, 500,000 Sandhill Cranes (*Grus canadensis*) gather in Nebraska's Platte River Valley in what has been described as one of earth's greatest avian spectacles. They stop along the Platte to accumulate fat as they migrate north to their breeding grounds. These fat reserves are primarily synthesized from waste corn, but invertebrates such as earthworms and insects make up a small portion of their diet as well. The cranes feed on corn exclusively in cornfields and on invertebrates almost exclusively in grasslands. Since it is possible that birds adjust their foraging techniques to save energy under thermally stressful situations, then during colder weather we predict the migrating cranes may spend more time in cornfields relative to warmer days, where they can eat high-energy corn with little effort expended compared to foraging for invertebrates in grasslands. Additionally, both colder and drier conditions increase the depth at which earthworms are found, which may have implications for cranes' preference for grasslands during those conditions. Our research will investigate these effects. We will conduct our study along the Platte River between Kearney and Grand Island, Nebraska. For each day of surveys, we will estimate the number of cranes and record the habitat type they occupy along the route. Additionally, the

temperature, cloud cover, wind speed, and any precipitation also will be recorded. These data will then be analyzed statistically to test for differences in the crane's foraging behavior in relationship to weather.

Poster U37 – Leigh-Anne Lehmann

Mentors: Joseph Dolence

Co-Author: McKenna Vininski, Joseph Dolence

Title: *Examination of sex-specific differences in type 2 innate lymphoid cells, plasmablasts, and T follicular helper cells following peanut exposure*

The mechanism of how peanut (PN) initiates immune responses to elicit PN allergy remains limited. PN is commonly found in household dust and we have shown that PN exposure via inhalation sensitizes mice. Furthermore, how sex differences influence the development of PN-specific immune responses is unknown. This study compared male and female mice exposed to PN in a 3-day mouse model to investigate how sex differences impacted the response of lung type 2 innate lymphoid cells (ILC2s) to inhaled PN. Lungs were collected from mice after 3-day exposure to PN. Cells were stained with antibodies to identify ILC2s by flow cytometry. Interestingly, ILC2s were sensitive to sex differences as ILC2s in female PN-exposed lungs were more abundant than in male PN-exposed lungs. We also examined B and T cells found in the lungs and lung draining lymph nodes (dLN) in a 10-day mouse model. CD19+ B cells and CD3e+ T cells were severely reduced in the lungs

of PN-exposed male mice at 10 days when compared to their female PN-exposed counterparts. Levels of T cells were also reduced in the dLN of PN-exposed males. Future studies will fractionate the B and T cell populations to examine whether sex differences influence the response of plasmablasts and T follicular helper cells to PN. This data suggests that testosterone plays a role in dampening PN-specific adaptive immune responses, possibly through negatively influencing ILC2s. Overall, this study provides critical insight into how sex differences could play a role in regulating PN-specific immune responses.

Poster U38 – Ellie Morrison

Mentor: Bryan Drew

Title: *Potential Hybridization in Two Species of California Salvia*

Salvia (Lamiaceae; mint family) is a diverse genus consisting of about 1,000 species. The genus is most diverse in Mexico and Central/South America, the Mediterranean region and southwest Asia, and temperate East Asia. *Salvia* also has minor species radiations in southern Africa and western North America. The genus is defined primarily by having only two stamens, each with their anther sacs separated by elongated connective tissue. There has been strong evidence of hybridization between some species, particularly in California (Walker, Drew, & Sytsma, 2015). For this project, we plan to investigate potential hybridization between *Salvia greatae* and *Salvia columbariae*. Both species are found in California, and there is currently no evidence that hybridization has

occurred between them. To examine this relationship, we will run PCR testing to compare phylogenies from nuclear ribosomal DNA (nrDNA) and chloroplast DNA (cpDNA). We plan to use previously collected samples, but may collect more samples during the course of the project if the opportunity arises.

Poster U39 – Reagan Tekolste

Mentor: Nicholas Hobbs

Co-Author: Sydnie Lowery

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

Emotional processors in the brain, such as the hypothalamus and amygdala, are able to influence changes in behavior when under stressful situations. Changing an animal's nutritional state can induce stress and thus alter their sex steroid levels. In addition to their role in sexual differentiation, sex steroids may also act as anxiolytics to reduce anxiety. Therefore, we hypothesized that mice that were food-deprived for 24 hours would exhibit higher levels of anxiety-like behavior compared to animals that had continuous access to food. If food deprivation triggers the emotional centers of the brain, then mice that are food deprived would spend less time in the open arm of an Elevated Plus Maze (EPM). Wildtype (wt) female, wt male, and testosterone feminization mutant (tfm) mice were divided into two groups: 1) mice that were food-deprived for 24 hours or 2) mice that were given continuous access to food. Subjects were then tested on an EPM for 10 minutes to measure anxiety-like behavior. We found

that there was no significant effect of genotype or diet on the average time spent in the open arm, not supporting our hypothesis of androgen receptor differences. This may have been due to the inadequate amount of time the mice were food deprived. In future research, we hope to have another group that is food deprived for a longer period of time for effects to set in.

Poster U40 – Marissa Baker

Mentor: Nicholas Hobbs

Co-Author: Kaitlyn Schultis

Title: *Effect of diet and androgen receptors on over-mark preference in mice*

Previous studies have found that protein content affects the spatial memory of rodents as determined by the ability to discriminate between the top- and bottom-scent donor of an over-mark. Spatial memory has been associated with the hippocampus, and androgen receptors play a role in the development of this brain region. The objective of the study is to determine if spatial memory is affected by the dietary protein content or androgen receptor expression in brain regions associated with spatial memory. To examine this objective, we tested the top-scent preference of wild type (wt) male and female mice, as well as testicular feminization mutant (tfm) male mice. These mice lack androgen receptors and are not fully masculinized. One group of each of these genotypes was fed a 6% protein diet, representative of the amount of protein available in a poor-quality habitat, and a second group

was fed a 20% protein diet, representative of the amount of protein available to mice living near a cultivated field. The mice were fed their respective diet for four weeks, and then exposed to an over-mark test. The test comprised of two phases. In the first phase, the mice were exposed to two overlapping scent marks from two different scent donors for 5 minutes. During the second phase, the scents were separated, and the amount of time spent investigating each mark was recorded for 3 minutes. We predicted that only wt male and female mice fed a 20% protein diet will show a top-scent preference.

Poster U41 – Britney de Leon

Mentor: Kimberly Carlson

Title: *Determination of Prevalence of Nora Virus in D. Melanogaster within the Central Nervous System or Body Cavity*

Nora virus is a picorna-like virus that appears to display no pathogenic effects, even at high viral titers. Previous research has shown *D. melanogaster* infected with Nora virus become significantly slower with time, compared to those that are not infected. This experiment is aimed to determine whether Nora virus infection is more prevalent in the central nervous system, specifically the brain, or in the body cavity of *D. melanogaster*. For this experiment, 20 male adult flies were collected from the previously tested Nora virus infected and uninfected stocks. The flies were dissected, cleanly separating the head and the body cavity, to ensure no cross-contamination between the cranial sample with any fluid from the *D. melanogaster* body cavity. In addition, the

hemolymph from another sample of flies (infected or not) were also collected. The head, bodies, and hemolymph were collected into separate 1.5 mL RNA-free centrifuge tubes, the RNA extracted, and RT-PCR analysis of the Nora virus ORF1 gene performed to determine infection status. Determination of positive Nora virus infection was demonstrated by a product at 790 bp. It was found that the heads, bodies, and hemolymph of the Nora virus infected flies all were positive for Nora virus infection, demonstrating that the virus is circulating from the gut to the brain. Currently, protein is being extracted from each of the samples to perform Western blot analysis for Nora virus presence. Overall, this research will provide us with information to support the hypothesis that Nora virus is migrating from the gut to the brain, resulting in the locomotor defect.

Poster U42 – Abbie Frazee

Mentor: Kimberly Carlson

Title: *Effect of Nora virus on Geotaxis and Longevity of 3 Drosophila Species*

Nora virus is a picorna-like virus that was first discovered in *Drosophila melanogaster*. Even though it appears to display no pathogenic effects, a locomotor defect has recently been documented. By cross-infection of food, it can be determined if Nora virus has an effect on other *Drosophila* species' geotaxis. It is unknown if Nora virus can cross-infect other *Drosophila* species and impair the locomotor ability. To test this, geotaxis assays and longevity analyses were used. To begin to address this question, three species, *D. melanogaster*

(positive control), *D. mercatorum* and *D. yakuba*, were infected with *D. melanogaster* Nora virus. To do this, sixty male Nora virus positive *D. melanogaster* were added to 4 bottles for a week. After this week, 25 couples per bottle of *D. mercatorum* or *D. yakuba* were added and allowed to mate for a week. The couples were morgued and virgin female flies were collected every 6 hours. Quart size cages with ventilation and food vial extension tube were established using 60 virgin female flies. Cages were marked with a line 4 inches from the bottom. Every three days, the cages were tapped on the table, and after one minute, the flies above the line were counted. In addition, the dead flies are being collected and stored for future RNA extraction, RT-PCR amplification of Nora virus ORF1 to detect Nora virus infection among the different species. The genome of *D. melanogaster* is similar enough to humans that they can be used as a model for human immunity and disease, as well as development and behavior. Nora virus is an RNA virus, like the SARSCoV2 that causes COVID19, and these cross-infectivity studies could provide information on how RNA viruses can cross-infect species and possibly other unrelated organisms.

Poster U43 – Phoebe Dunbar

Mentor: Keith Geluso

Co-Authors: Keith Geluso, Nicole Mittman, Gregory Pec, Mary Harner

Title: *Microbial Composition and Diversity in Heteromyid Cheek Pouches with Implications for Plant Establishment*

The goal of our project is to identify fungal and bacterial species associated with kangaroo rat cheek pouches. Kangaroo rats store their seeds in many underground scattered caches. As they store and move seeds, fungi is transferred from cache to cache and can live inside their cheek pouches. These pouches are external, fur-lined, and dry, making them a prime place for fungi to grow. These spores can improve the propagation and germination of the seeds as they begin to grow in the caches where they were “planted”. This project will update the record of fungal and bacterial species found in kangaroo rats cheek pouches from studies conducted over 20 years ago with now outdated identification techniques. It will also help us learn about the mutualistic association between fungi and plants that grow from kangaroo rat caches.

I performed a literature review to learn what scientific literature is already published. We trapped Ord’s kangaroo rats in the Kearney area with Sherman live traps and swabbed their cheek pouches with wet and dry swabs. We transferred each sample to a solution allowing it to be stored at room temperature for up to two years. We are in the process of running each sample through Qiagen and IsoHelix DNA extraction kits to prepare the samples to be sent to a lab to determine what species of fungi are present in our samples. In the future we hope to write up and publish our results.

Poster U44 – Charlotte Okraska

Mentor: Bryan Drew

Title: *Central Nebraskan Pollinators of Salvia azurea*

The goal of this project is to determine which insect species visit and pollinate the azure-blue sage, *Salvia azurea* (Lamiaceae). Once the plants are flowering, the methods used during this project will include a combination of direct field observations, collections of insect specimens, and recording devices. A review of the current literature pertaining to pollination biology, *Salvia azurea*, and native Nebraskan pollinators will provide readers and researchers with the background knowledge necessary to comprehensively understand this project.

Poster U45 – Jonathan Wentz

Mentor: Letty Reichart

Title: *Determining Similarities and Differences of Cove Use by Migratory Waterfowl at Harlan County Reservoir, Nebraska*

In North America, many species of waterfowl follow north-south migratory paths each spring and fall. Suitable habitat along migratory paths is necessary to provide stop-over sites where birds can rest and refuel along their migratory path. Waterfowl species, such as ducks, geese, and coots, are commonly observed on large lakes and reservoirs on their migratory path. Many waterfowl species have been observed on Harlan County Reservoir, located in south central Nebraska, but no previous studies have estimated habitat use by waterfowl on this reservoir. Harlan County reservoir is primarily managed as an outdoor

recreation area, water holding facility, and recreational fishery. The main reservoir has multiple coves along the periphery of the reservoir. Each cove likely provides different habitat for migratory waterfowl, and the connectedness of the cove to the main reservoir (e.g., some coves are connected, some are partially connected, and some are disconnected from the main reservoir) may also influence the waterfowl use of coves at the reservoir. For this project, I will estimate cove habitat use by waterfowl species during spring and fall migration. Specifically, I will conduct analysis to learn about the similarities between each cove four years.

Poster U46 – Rebecca Meusch

Mentor: Dawn Simon

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

Introns are found in all sequenced eukaryotic genomes, yet their origins are unclear. This is due to their antiquity and the lack of selective pressure, which results in high sequence divergence. This has made finding intermediate forms difficult. However, some of these issues appear to be mitigated in nuclear ribosomal RNA (nrRNA) in lichen-forming and allied fungi. Introns are particularly abundant in the genus *Physcia*. In this project, we focus on introns at two sites (1092, 1094) within the large subunit (LSU) rRNA gene. Previous work showed that these introns never co-occur in the same repeat, but they are both found in the genomes of at least 36 different isolates. Based on sequence similarity we hypothesized that the two introns share a common origin. In this study, we sought

to expand the sample size by sequencing the intron from different isolates. However, until now neither intron has been found in any of the studied specimens. This has been confirmed using five sets of intron-specific PCR primers. The next step is to re-visit some of the same locations as the previous study to determine if introns have been lost in these species or if intron presence/absence varies based on geographic location.

Poster U47 – Jalynn Ellenwood

Mentor: Gregory Pec

Co-Author: Shaylee Johnson

Title: *Response of *Andropogon gerardii* to varying intensities of simulated defoliation*

Grassland ecosystems are extensively impacted by land use changes such as grazing, fire, and tillage, which also vary in both their frequency and intensity on the landscape. Of these, grazing has shown to have a significant impact on the composition, diversity, and functioning of grassland ecosystems due, in part, to its influence on plant productivity. Less understood is the response of roots to sudden reductions in leaf and stem tissues due to varied levels of grazing intensity. Here, we investigated the response of *Andropogon gerardii* (big bluestem), a perennial grass that is commonplace among native prairie plants of Nebraska, to varying levels of simulated defoliation (none, low or high) in a glasshouse. Since plant responses are highly associated with changes in the composition of fungal community

mutualists, a secondary objective was to also test the effects of fungal inoculum (with or without) on seedling resource allocation. Highly defoliated seedlings had lower shoot and root production as well as higher root-to-shoot ratio compared with low to non-defoliated seedlings. Whereas less defoliated seedlings had greater shoot productivity than high to non-defoliated seedlings. A similar pattern was present with seedlings grown with fungi compared to seedlings grown without any fungal mutualists. We demonstrate that high levels of simulated defoliation mitigate biomass production and regrowth ability of big bluestem seedlings but also lead to an increased root-to-shoot ratios. Taken together, lower grazing intensity may produce the most beneficial effects on perennial grasses, such as big bluestem, and are probably mediated through effects of belowground fungal mutualists.

Poster U48 – Terrell Garraway

Mentor: Nicholas Hobbs

Title: *Effect of Androgen Receptor on Scent Marking Behavior in Mice*

Most mammals use olfactory behaviors to either attract or indicate interest in potential mates. One olfactory behavior used for this is scent marking.

Testosterone, a kind of androgen, is known to play a role in the masculinization of the brain by binding to an androgen receptor (AR). However, it is unclear if the presence or absence of AR in male and female rodents affects their olfactory behaviors, including scent

marking, towards opposite-sex conspecifics. We hypothesized that the presence or absence of AR in both subject and scent donor mice affect scent marking behaviors of the subject mice. We exposed male and female mice to scent marks of an unknown mouse for 20 minutes, then recorded the number of over-marks made on those scent marks. We predicted that wild type (wt) female mice (two copies of a functional AR gene), carrier female mice (one functional and one dysfunctional AR gene), and tfm male mice (a dysfunctional AR gene) will have a higher frequency of over-marking to male scent marks, whereas wt males will have a higher frequency of over-marking to female scent marks. Such results would suggest that AR plays a role in establishing male-typical patterns of scent marking. This research is significant because it will provide further insights into neuronal-hormonal mechanisms in mice and testicular feminizing mutation.

Poster U49 – Mary Fiala

Mentor: Surabhi Chandra

Title: *Binding Abilities of Trans-Cinnamic Acid Monomer and Dimers to Adenosine A3 Receptors*

Adenosine Receptors (ARs) are G-Protein Coupled Receptors (GPCRs) which have been shown to have therapeutic potential for conditions such as chronic pain, cancer etc. ARs are made up of four subtypes, A1AR, A2AAR, A2BAR, and A3AR. A3ARs have previously been indicated to lower inflammation, halt or prevent cancer, and produce antihyperalgesic effects in many

preclinical pain models, specifically for neuropathy. We have previously published in animal model that ferulic acid dimer, a cinnamic acid derivative, has non-opioid antinociceptive properties through primarily binding to A3ARs. However, research is lacking on the in vitro effects of the binding ability of trans-cinnamic acid to A3ARs. We hypothesized that specific modifications of trans-cinnamic acids would increase binding to A3ARs as compared to their monomeric counterparts. For this study, we performed competitive binding assays (CBAs) using Chinese Hamster Ovary (CHO) cells. The compounds analyzed included monomers and dimers of 3-methyl cinnamic acid and 3-methoxy cinnamic acid. The binding assays performed suggested that 3-methoxy cinnamic acid dimer was the most effective in binding to A3ARs, while the other three showed no significant binding. A3ARs are believed to proceed through a pathway coupled to Gi and Go proteins, which reduces cAMP levels produced. Further experiments will be performed to investigate the receptor activation pathway with these compounds.

Poster U50 – Josh Hergenreder

Mentor: Gregory Pec

Title: *Changes in Soil Chemical Properties Following Vegetative Clearing of Eastern Redcedar*

Eastern redcedar (*Juniperus virginiana*) is considered a native invader in eastern North America and has expanded rapidly in recent years into open and semi-arid grasslands. This encroachment has led to

declines in biodiversity, lowered habitat quality, and has altered nutrient cycling within these ecosystems. Soil chemical properties partly underlie successional trajectories of these plant communities, yet their role in restoration is often overlooked. Here, we tested the relative importance of a common management tool used in restoration – vegetative clearing – to assess key soil chemical properties following the removal of eastern redcedar. Importantly, we compared changes in soil chemical properties on restored landscapes to that of reference grassland ecosystems. Preliminary results show that mechanical removal of eastern redcedar substantially affected several soil chemical parameters. First, soil water potential was less negative in eastern redcedar and remnant sites, but considerably more negative in restored areas. Second, soil organic matter declined slightly after vegetative clearing of eastern redcedar, though was substantially less than in native or remnant grassland sites. Third, the ratio of carbon-to-nitrogen was three-fold lower in eastern redcedar and restored sites compared to native grassland sites. Taken together, our results indicate that common management interventions in restoration may not alone reestablish soils of target grassland systems on restored sites in the short term.

Chemistry

Poster U51 – Megan Cook

Mentor: Hector Palencia

Title: *Design and Synthesis of Organocatalysts for Asymmetric Synthesis Under Green Conditions*

The synthesis of new drugs to combat diseases more efficiently is an area of current interest, playing a key role in the fighting of viral and bacterial diseases. Relevant examples are the COVID-19 and antibiotic resistance. NHCs are used as organocatalysts, ligands for metals in the synthesis of chiral and non-chiral compounds. NHC complexes of silver, show antibiotic properties, which activity depends on the structure of the complex. We have synthesized several complexes, some of them have promising antibiotic resistance. Our preliminary results will be presented and discussed.

Poster U52 – Kalynn Doehling

Mentor: Frank Kovacs

Co-Author: Frank Kovacs

Title: *Characterization of the effects of Mg⁺² and Zn⁺² concentrations on the activity Amino-Levulinic Acid Dehydratase (ALAD) from E. coli*

Heme biosynthesis is a critical pathway for most organisms due to the widespread use of heme as an essential co-enzyme. ALAD is an enzyme that catalyzes the second step in the synthesis of the small heme molecule (MW 617). The reaction catalyzed is the condensation of two 5-aminolevulinic acid (ALA) molecules to produce porphobilinogen (PBG), a structural piece used to create the basic

heme structure. Defects in ALAD are responsible for several life threatening and poorly understood disorders. The research proposed here aims to characterize the effects of a range of Mg⁺² and Zn⁺² (ions known to impact ALAD activity) concentrations on the activity of this enzyme using a direct PBG measurement microplate assay recently developed in our lab.

Poster U53 – Alethia Henderson

Mentor: Frank Kovacs

Co-Author: Frank Kovacs

Title: *Characterization of the effect enzyme concentration on the activity Amino-Levulinic Acid Dehydratase (ALAD) from E. Coli*

The small organic molecule heme (MW 617) is an essential part of the chemistry of a number of critical biomolecules. It is what allows hemoglobin to carry oxygen from the lungs to the tissues allowing basic energy production. The synthesis of heme is therefore of critical interest to biochemistry. The enzyme ALAD catalyzes the second step in the synthesis of the heme. This step is the condensation of two 5-aminolevulinic acid (ALA) molecules to generate one porphobilinogen (PBG), four of which are used create a molecule of heme. Improper function of ALAD can lead to a number of life critical disorders. In this project, we will a direct PBG measurement microplate assay recently developed in our lab in order to characterize the impact of ALAD concentration on the kinetic properties of

the enzyme in the catalysis of PBG production.

Poster U54 – Zach Zavodny

Mentor: Michael Moxley

Title: *Kinetic progress curve analysis of human citrate synthase with implications on protein acetylation*

Human citrate synthase (hCS) is a mitochondrial enzyme that catalyzes the aldol condensation of an acetyl group from acetyl coenzyme A (AcCoA) to oxaloacetate to form citrate. hCS is traditionally discussed as the first enzyme in the tricarboxylic acid cycle and its activity is often used as a means to evaluate mitochondrial density, such as in muscle tissue. Its activity is important for aerobic exercise performance as well as basic metabolic function as a housekeeping enzyme. It has been shown through several mass spectrometry based physiological studies that CS is acetylated on a number of lysine residues located throughout the protein under metabolically stressed conditions. However little follow up studies have been reported on the impact of acetylation on CS activity. Here we kinetically characterize hCS through rigorous progress curve kinetic modelling and mimic the impact of acetylation of K393, near the AcCoA/CoA binding site, by mutating this residue to a glutamine. The hCS-K393Q mutant displays an increase in the K_m for AcCoA relative to the WT by at least 30 fold, whereas the K_m for oxaloacetate was similar to WT. Altogether our data suggests a much

attenuated binding affinity for AcCoA when hCS is acetylated.

Poster U55 – Wuilian Martinez

Mentor: Mahesh Pattabiraman

Title: *Synthesizing Analogs of Incarvillateine for Anticancer Properties*

The compound Incarvillateine (INCA) has been shown to use the adenosine receptors as part of its mechanism of action for cancer cell growth inhibition. There is potential in using INCA or its analogs for cancer suppression seeing as cancer cells have an upregulated amount of adenosine. Structural analogs of INCA have also been shown to bind fatty acid binding protein 5 (FABP-5), which plays a particular role in prostate cancer proliferation. Being that INCA is structurally complex to synthesize, there is interest in being able to produce analogs of INCA to test for anticancer properties. One analog of great interest is a 1-naphthol α -truxillic monoester because of its use in binding fatty acid binding protein 5 (FABP-5) for purposes of cancer suppression. Our lab has begun work with synthesizing this, and other analogs of INCA for further testing in cancer cell growth.

Poster U56 – Tara Buettner

Mentor: Annette Moser Lintz

Co-Authors: Kenneth Ernest, Annette Moser Lintz

Title: *Complexation of Calcium with CPC using Paper Microfluidics and Flow-Through Devices*

This project focused on developing experiments using paper microfluidics and flow-through devices for Analytical chemistry student lab settings. For the wax-wells paper microfluidic method, the sheets of paper were baked to cure the wax that had been 3D printed onto its surface. Then, CPC and 9.5 pH Ammonium buffer were pipetted into each well and allowed to dry. Different concentrations of calcium solution were added to each in order to “titrate” the CPC solution, resulting in a colorimetric assay. For the flow-through method, the device was set up using filter paper soaked in CPC and 9.5 pH Ammonium buffer, layered with another filter paper treated with calcium solution. Standard curves will be generated using color measuring software such as ImageJ or Color Assist, and used to write an experimental procedure for student use.

Poster U57 – Madeline Riesberg

Mentor: Haishi Cao

Title: *Florescent Sensor for Biological Detection*

Hydrogen sulfide (H₂S) is a cytotoxic gas that has recently been demonstrated as a novel neuromodulator. Endogenous levels of H₂S have been found to range between 50 and 160 μM in neuronal cells. Considerably lower H₂S levels that correlate with increases in neuronal damage and degeneration were reported from patients with Alzheimer’s disease that was a consequence of cellular oxidative stress, indicating that H₂S might act as a cellular redox modulator. Thus, accurately measuring H₂S level becomes

a critical issue to understand its biological roles and consider using it as a therapeutic reagent. Currently, the fluorimetric method has proven as a useful assay for detection of H₂S and hence has attracted widespread interest due to its ability of real-time sensing. In contrast to instrumental methods with single type detection signal, fluorescence sensing can provide multiple signal channels including intensity change, emission wavelength shift, and variation of lifetime in response to analytes based on abundant sensing mechanisms to satisfy detection demands in various scenarios. In this project, a fluorescent chemosensor based on 2,3-naphthalimide was developed. The sensor showed high selectivity and sensitivity to H₂S in aqueous media, and was successfully applied for cell imaging.

Poster U58 – Jake Weston

Mentor: Kristy Kounovsky-Shafer

Title: *Study of how temperature affects fluorescent dye intercalation while undergoing DNA electrophoresis (cont.)*

The fluorescent dyes in the study includes a variety of dyes that are used to stain DNA that are within the TOTO-1 family of dyes, including YOYO-1. These dyes intercalate into the DNA by inserting between the base pairs of the DNA. The intensity of the dye intercalated into the DNA molecule can be monitored using a fluorimeter. Although, in previous studies, the intensity of the dyes has decreased over time while a voltage was applied over long periods of time. This created a problem, because when the intensity

decreased, it was difficult to detect the DNA during the experiment. Therefore, we are incubating DNA stained with YOYO-1 at a dynamic range of temperatures to measure how the intensity changes with temperature.

Poster U59 – Rishav Srivastava

Mentor: Mahesh Pattabiraman

Co-Authors: Bailey Premer, Mahesh Pattabiraman

Title: *Supramolecular Photochemical Singlet Oxygen Generation*

Singlet oxygen is an excited state of molecular oxygen that can be generated by light exposure. This form of oxygen can cause death to bacteria by oxidizing proteins or lipids. In our study, we wanted to determine if this characteristic of singlet oxygen could be exploited for antimicrobial use as surface disinfection of bacteria, fungi, and viruses. The experiments were set up by mixing various dyes with the probe molecule anthracene and allowing for irradiation to take place over hours to form the singlet oxygen species that we are looking for. The goal was to see which dye produced the most amount of singlet oxygen. After several experiments, we were able to confirm that from all the dyes that we had used, Methylene Blue produced the most singlet oxygen. This is important as we move to the next step of finding antimicrobial efficiency which is the transition from testing dyes on their ability to produce singlet oxygen to comparing results from the liquid state to solid state.

Poster U60 – Kenneth Ernest

Mentor: Annette Moser Lintz

Title: *Determining Calcium Levels Using Paper Titrators*

In the fall 2020 semester, a method to detect calcium levels using paper titrators composed of wax printed channels on filter paper was developed. Initially, these titrators were used with EDTA and the indicator calamagite. Unfortunately, once applied and dried on the titrator sheets, the EDTA did not bind the calcium ion. Looking at a new system utilizing a combination of borate buffer and o-cresolphthalein-complexone as an indicator, binding the calcium ion appears to be possible even after drying. Currently, work is being done to optimize a method that can quantify moderate amounts calcium ion using these paper titration sheets. This semester we had begun to determine what concentrations of calcium would work on these paper titrators as well as continued tweaking our buffer and indicator amounts. We were in the process of continued testing to gather more data and begin to move forward with the next parts of our project when the flood occurred, and we lost our data and materials.

Poster U61 – Jack Linders

Mentor: Kristy Kounovsky-Shafer

Title: *Dissolution of BAC-crosslinked polyacrylamide gel utilizing Urea and tris(2-carboxyethyl) phosphine (TCEP)*

3D printed devices are being utilized with polyacrylamide gel to create roadblocks to elute and concentrate DNA. A voltage

is applied to the device and DNA is concentrated at the interface between solution and the acrylamide. During the concentration of DNA, some of the DNA is embedded in the acrylamide. To find how much DNA is embedded, the polyacrylamide gel must be dissolved to determine the concentration of DNA. The polyacrylamide gel was changed slightly, using BAC for the cross-linking mechanism. The resulting gel was suspended in a dynamic range of concentrations of Urea and tris(2-carboxyethyl) phosphine (TCEP). The most rapid degradation of the gel matrix resulted from a solution of 2.0M Urea and 0.1M TCEP and required two weeks to dissolve the gel matrix. Two weeks is not practical, so the gel and solution were suspended in a 60°C water bath. This reduced the amount of time the gel dissolved by four days.

Cyber Systems

Poster U62 – Noah Meyer

Mentor: Sherri Harms

Title: *Nea Edem*

Research involving the creation of new software innovations is one of the major areas in computer science research. As technology continues to advance and become more accessible, the question of how an entrepreneuring person can create video games without existing connections in the industry is becoming a worthwhile exploration.

This research explores the work of one such individual who has created unique gaming experiences through a sole proprietorship. The objective of said research is to explore the game design and implementation processes that were utilized in this venture, as well as explore the stylistic roots of the resulting product.

The student has previously seen success with the creation of two Lloyd the Monkey games. This research describes a new project that serves as a creative and academic continuation of the ethos behind the Lloyd the Monkey series. This new project, titled Nea Edem, is a 3D exploratory action game that combines a variety of inspirations, ranging from prior games to animated film. It is somber in tone and explores themes of isolation and ruin perfectly suited for today's social environment.

A brief introduction to what the user will experience with this new game as well as lessons learned through the development process are presented.

Poster Description

Serving as a creative and academic continuation of the ethos behind the Lloyd the Monkey series, this 3D exploratory action game explores themes of isolation and ruin perfectly suited for today's social environment.

Poster U63 – Shushant Khanal

Mentor: Sharon Obasi

Title: *Using Technology to Prevent Human Trafficking in Nepal*

With the literacy rate of just 65.9% (Central Bureau of Statistics, 2011), the problem of human trafficking is growing in Nepal. This exploratory project was designed to study the problems related to human trafficking in Nepal with emphasis on strategies implemented by the government of the country in handling the problem at the current point in time, and to explore how technology may be used to tackle the problem of human trafficking in a developing country like Nepal.

Technology and big data can be used in various ways to prevent this problem and one of the interesting topics that is still in early stages of development is mobile applications to track, trace and inform about human trafficking. Secondary sources of information were used to learn about the current situation of human trafficking in Nepal, the country's approach to tackle this problem, developed countries' strategies regarding big data, possibility of using these strategies in Nepal and the new idea of apps to deal with the problem of human trafficking. New innovations and ideas in the technological sector have opened up a lot of possibilities when it comes to dealing with various world problems like human trafficking especially in developing countries like Nepal.

Poster U64– Anup Kathet

Mentor: Sharon Obasi

Title: *Using Microblogs to access Health Information, its limitations, and opportunities.*

“Web 2.0” has changed the way people interact with information online, moving from passive consumption to active creation of content (Scanfeld, D., Scanfeld, V., & Larson, E. L. (2010)). User generated content is common especially after the rise of social media. Microblogs are one form of content creation where concise posts are created and shared to an audience on platforms like Twitter and Tumblr. These posts could be links, audio, images, or videos but are usually short and condensed. Due to wide use of social media microblogs are one of the major sources of information. Quick transfer rate, short and easy to follow and dense concise information are its major advantages. These advantages have a huge potential in terms of sharing health related information. User created content could give different personal views and experience regarding health issues and its care. People can personally relate to this kind of information but due to lack of validity of the information this can create more problems as well. This study was conducted to find out about the use of social media to access health information during the pandemic. Data were collected through an online, Qualtrics survey. Results revealed that participants (n=62) relied on social media including microblogs to access health information during the pandemic but gave a low rating

of the trustworthiness of the information accessed. There are limitations in this study including the relatively small sample size and the brevity of the survey.

Nonetheless, this project provides the start of a broader investigation of the use of microblogs to access and share health information.

Physics & Astronomy

Poster U65 – Lena Janssen

Mentor: Joel Berrier

Title: *Building Mass Functions and Estimating Merger Rates for Calculations of Cosmic Confusion Noise*

Compact objects such as white dwarfs, neutron stars, and low mass black holes captured by supermassive black holes, which sit at the center of galaxies with masses over 10^6 solar masses or greater, generate a background noise in gravitational waves that affects the Laser Interferometer Space Antenna (LISA) and Laser Interferometer Gravitational-Wave Observatory (LIGO) observations. We discuss a way to calculate the capture rates by supermassive black holes in an attempt to describe the gravitational waves that will be detected as this background noise in the universe. In order to do this, we calculate the number of black holes in space as a function of mass across cosmic time and the number of merger events per unit time.

Professional & Applied Studies

Accounting, Finance & Economics

Poster U66 – Daniel Vargas Castano

Mentors: Frank Tenkorang

Title: *Do international students increase the cost of universities in the United States of America?*

In the U.S., it is expected that public universities have two different prices: one for residents and the other for non-residents. The non-resident tuition is most often more expensive than the resident tuition. There is also often a third tuition price for international students that is higher than non-resident students. One of the potential arguments is that international students cost more to educate. Therefore, the purpose of this paper is to find out if international students correlate with higher costs of providing higher education in the U.S. The study uses generalized least squares regression with fixed effects and expenditures and descriptive characteristics data from 482, 4-year public universities from across the United States from 2015 to 2018. The results show a significant positive correlation between the percentage of international students and core university expenses. This result gives some validity to the hypothesis that international students cost

more to educate. Although, there are some limitations in the study because the model cannot definitively establish direct causation.

Communication Disorders

Poster U67 – Klaire Kirsch

Mentor: Whitney Schneider-Cline

Title: *Exploring Bug-In-Eye, Immediate Feedback for Graduate Speech-Language Pathology Student Clinicians*

Graduate speech-language pathology student clinicians typically receive feedback from their supervisors after each treatment session is completed. Research has shown that immediate, real-time feedback was effective in developing students' clinical skills in other professions such as athletic training (Nottingham, 2018) and student teaching (Gibelhaus, 2017). The current study explored the use of Bug-In-The-Eye (BITE) feedback for these students to determine the benefits and limitations of having immediate, real-time feedback rather than delayed feedback about their clinical interactions.

Bug-In-The-Eye feedback was implemented with graduate students in the Communication Disorders department. All graduate students in the Communication Disorders department were invited to use the technology. Three graduate students used it during one semester, and survey results were collected from all students about the

feedback they received across the semester; specific information was also collected from those who received BITE feedback.

Results from the graduate student clinician surveys will be analyzed and presented as a part of this poster. Responses from participants will shed light on the benefits and limitations of implementing real-time, BITE feedback for graduate speech-language pathology student clinicians. Discussion regarding future research and implications for this study will be included.

Poster U68 – Clair Neil

Mentors: Philip Lai

Title: *The Impact of Early Brain Injuries on Language and Communication*

Children with early brain injury at the beginning of life can provide clues towards understanding the neural bases of social and expressive behaviors. The purpose of this study is to explore if children with left or right hemisphere brain injury are similar in how they behave/communicate at school age or are they more similar to their typically developing peers. The children studied are between the ages of 7-14 and the dataset includes a 7-10 minute interview from 8 left hemisphere injured children, 8 right hemisphere injured children and 8 typically developing children. The current procedure of this study is to code social interactions of children with early brain injury using Eudico Linguistic Annotator (ELAN) software to see various communicative behaviors. Coding will

involve the amount of verbal speech for topics discussed, gestures, and facial expressions. From our behavioral dataset, we can determine which children are continuing to show the impacts of their brain injuries based on these categories. In addition, from our imaging dataset, we can document where in the brain the damage occurred. Research questions that result from this project include the following: (1) Is the child's injury related to their language performance (Broca's area or Wernike's area)? (2) Are facial expressions related to injuries within the right hemisphere? In adults with right hemisphere brain injury, the amount of facial expressions are diminished. Will we observe similar deficits in children with right hemisphere brain injury? Results and implications will be discussed.

Poster U69 – Cassidy Kirsch

Mentor: Philip Lai

Title: *Developmental Gesture Use and Communication in Children with Autism Spectrum Disorder*

Children with Autism Spectrum Disorder (ASD) have impairments in social communication that interfere with personal, professional, and academic skills. The disorder affects an estimated 1 in 59 children in the United States. Compared to their typically developing peers, most children with ASD develop language skills later and at slower rates.

In this project, the development of gestures and emotional expression were investigated during toddlerhood in

individuals with ASD. Categories coded included iconic, beat, deictic, and metaphoric gestures and positive and negative emotional expressions. Coding was completed on a computer software called Eudico Linguistic Annotator (ELAN). Categories of gestures and their antecedent behaviors were investigated. This type of coding will provide in-depth information about the child's pattern of nonverbal communication.

As for positive and negative affect, categories included crying, whining, screaming, and laughing. The research question is: During this three-year span from 2.5 to 5.5 years of age, will we see children's gesture increase overall and what types of gestures are these children using? In addition, how will emotional expression change over time when children engage with their mothers during a 15-minutes free play session.

We hypothesize that children will use deictic gestures the most and overtime this gesture type will be predominating. As children develop, we expect to observe more beat and iconic gesture use. For emotional expressions, we expect children to express negative emotions more when they are younger and decrease as they age. For positive emotions, we expect a slight increase or stable level across the three years.

Poster U70 – Holly Rockenbach

Mentor: Philip Lai

Title: *Investigating communication through gestures in young children with Autism Spectrum Disorders and their mothers*

Autism Spectrum Disorder (ASD) affects an estimated 1 in 54 children in the United States. According to the Center for Disease Control and Prevention (CDC), individuals with ASD are characterized by deficits in social interaction and social communication, as well as having restricted behaviors and narrowly focused interests. This communication deficit has been observed when children with ASD interact with others, including their own mothers. The goal of this longitudinal project is to investigate responses to gestures and how they evolve across a span of four years. Specifically, how children with ASD respond to their mother's gestures, if at all, between the ages of 2.5 to 5.5 years of age during a 15-minute free play exercise. In this study, there were ten children total being observed, and they were each looked at four times over four years. The focus of the coding took place within the one second post-gesture of the mother. Coding of these forty data points was completed on a computer software called Eudico Linguistic Annotator (ELAN). This program can create multi-tier annotations based on behaviors observed in the data. ELAN permits real-time integration of behaviors while gathering information regarding duration, frequency, and latency. It is hypothesized that as the children with ASD develop, they will

become more responsive to their mother's gestures. This is due to familiarity with social engagement with their mothers, and a greater awareness of social expectations as they age from 2.5 years old to 5.5 years old. Results and implications will be discussed.

Poster U71 – Megan Bahns

Mentor: Philip Lai

Title: *What are the effects of emotion-eliciting music on communication in children with High Functioning Autism and children with Perinatal Stroke?*

Lower levels of anxiety and a decrease in maladaptive behaviors have been found in various groups of children with developmental delays when engaging in musical activities. In this study, our groups included: typically developing (TD) children, children with High Functioning Autism (HFA), and children with Perinatal Stroke (PS). These school-age children were between the ages of 7 to 14. Participants listened to pieces of emotion-eliciting music from a computer as they sat at a table. The study consisted of 3 instrumental pieces of recorded music that were classified as happy, sad, and afraid. These musical pieces were ten seconds long. After listening to the musical clips, children were asked to tell a story about a time they felt that particular emotion. Children could take as much time as needed to express themselves when telling their personal stories. Behavioral coding while children were telling the story included gestures, eye gaze, and facial expressions. This can inform how the children are reacting when

engaging in musical activities. Facial expression coding categories included: positive, negative, neutral (baseline), and other (with no affective content). Coding was completed on a computer software called Eudico Linguistic Annotator (ELAN). Since these children have communication deficits in their daily lives, will they express themselves more after listening to music? In addition, the impact of the emotion the music has can be investigated; we predict happy music to elicit greater expressivity, with sad being second, and afraid the least amount of expressivity. Results and implications will be discussed.

Poster U72 – Charlotte Griffith

Mentor: Ladan Ghazi Saidi

Co-Author: Ladan Ghazi Saidi

Title: *Management of Depression and Anxiety in Patients with Aphasia by Speech-Language Pathologists*

Aphasia is a disability caused by a stroke or brain injury that results in loss of language. Symptoms of aphasia include difficulty comprehending spoken language, production of language, trouble finding words, difficulty writing, and difficulty with reading (Isaphany, 2012). Depression often accompanies aphasia (Worrall, et al, 2016). It has been reported that 30% of stroke survivors suffer from depression (Morrison, 2016). In patients with expressive problems, the number increases up to 70% (Morrison, 2016). On the other hand, it has been reported that although speech-language pathologists (SLPs) notice the depressive symptoms in patients with aphasia, they do not

necessarily refer them to psychologists (Northcott, et al, 2017). This raises the concern that patients with aphasia may not receive the mental health care and support they need.

During the 2020 Undergraduate Research Fellows Program, we developed a Qualtrics survey that is based on a previous study conducted in the United Kingdom (Northcott, et al, 2017) for a pilot study on speech-language pathologists in Nebraska. This study uses cluster sampling by targeting all practicing speech-language pathologists who are members of the Nebraska Speech-Language-Hearing Association (NSLHA).

The results of this study will shed light on the need for effective interprofessional collaboration in healthcare systems to improve the psychosocial health of individuals with aphasia. Identifying the scale of this issue will help determine what next steps mental healthcare clinicians and speech-language pathologists can utilize to implement a more significant life-quality for patients diagnosed with aphasia.

Poster U73 – Paige Moore

Mentor: Ladan Ghazi Saidi

Title: *Dyslexia in Children and Working Memory*

In this presentation, I will focus on dyslexia in children and working memory. Dyslexia is a language disorder that involves difficulty reading due to impairment of speech sounds and cognitive processing such as letter-sound decoding. Working memory is a cognitive

process that involves maintaining and processing the information in mind. Working memory is involved in many cognitive functions including language. Impairment of working memory is associated with impairment of language (Deldar et al., 2020). I will discuss how dyslexia may be explained by impairment of working memory.

Industrial Technology

Poster U74 – Victoria Alvarado-Contreras

Mentor: Dana Vaux

Title: *Test Biophilic Design Matrix as Framework for Design*

The purpose of this study was to assess scholarly literature related to theories of biophilia in human behavior, restorative theory, and natural environments and analyze the Biophilic Interior Design Matrix (BIDM) as proposed in the literature (McGee, 2019). It is common for individuals to seek comfort and relaxation in nature (Kellert, 2008 pg.5). The idea is to incorporate elements found in nature encourage human comfort and relaxation within an interior space, such as an office. An existing building located in Lincoln, NE was used to design and apply attributes suggested by the literature. The study was dictated by the Biophilic Interior Design Matrix and the six elements it claims should be included in design to successfully develop a biophilic interior design. The elements used from the matrix include actual natural features,

natural shapes and forms, natural patterns and processes, color and light, place-based relationships, and human nature relationships (McGee, 2019). In the beginning stages, a color scheme was selected using a color theory method in which a photograph from a natural setting is broken up and colors are taken from it at random. Natural light was allowed into the space using a curtain wall on one side of the building and a skylight in the interior private areas of the office. Actual natural features were added by placing stone siding partition walls and creating a living wall within the space. In the lighting, versions of an intricate DNA shaped light fixture were added as well as recessed lights strategically placed above the ceiling panels to mimic shadow figures found in nature. Sphere sconces resembling planets with planter features were added to the walls on the second floor. On the first floor, lighting resembling water elements and creatures such as clams were placed on the walls along with a wave pattern ceiling treatment. As the design came together, the results seemed to stray away from traditional office design. Rather than the typical institutional atmosphere, the colors, textures, and lighting amassed created an energetic lively place while maintaining a professional and purposeful area throughout. The intention went beyond simply placing plants in an existing space, the architectural features themselves bring biophilic characteristics. This study exemplifies interior spaces do not have to follow the traditional route of design. The purpose of design is to create aesthetic yet functional spaces, yet most designs

seem to use a mold and never break from it. By following the Biophilic Interior Design Matrix, design can deviate from traditional tendencies and begin to incorporate qualities that consider human needs.

Poster U75 – Molly Schultz

Mentor: Ahna Packard

Title: *The MultiTaction Experience: Visualization and Collaboration Technology in the World of Interior Design*

The MultiTaction touch screen solution is a new technology that is meant to help visualization and collaboration skills come to life. This software is located in Discovery Hall and has been used in many different ways. This research project focuses on how to utilize this technology for presenting an interior design pitch to clients. The presentation in late April will consist of full design concepts displayed on the MultiTaction in new and exciting ways. Process work will be presented during research week.

Kinesiology & Sports Sciences

Poster U76 – Kelly Robb

Mentor: Kazuma Akehi

Title: *Effects of repetitive head microtrauma on psychomotor and neuromuscular function of the collegiate womens soccer players during COVID-19 pandemic*

Contact sports such as football, basketball, and soccer are at higher risks of sports related concussions. There is limited research on how season long contact sports participation influences athletes cognitive and neuromuscular functions due to repetitive micro-traumatic impacts to the head. Purpose: The purpose of this study was to examine the effects of repetitive micro-traumatic impacts to the head on eye movement, saccades, balance, and reaction time in collegiate women's soccer players. Methods: The current study utilized the existing clinical data collected by the college Sports Medicine team. The clinical data includes eye and hand reaction time, static sway balance index, and psychomotor and neuromuscular functional values (i.e. eye movement, attention, and speech function). These clinical data were collected by the sports medicine team before and after their competitive season. Results: There was a significant decrease in the psychomotor and neuromuscular function test (i.e. King-Devik test 1) at the end of the season ($P=0.02$). However, no other significant differences were observed

($P>0.05$). Conclusions: Due to the COVID-19 pandemic during their competitive athletic season, the soccer team did not have their regular season, which altered their practice and game intensity (physical contacts) and playing time. Therefore, these resulted in no significant changes through their atypical season. Clinical applications: We believe the COVID-19 pandemic affected the soccer team's intensity and volume of practices and games. Thus, future studies are important to closely monitor their athletic performance to identify changes in balance, reaction time, eye movement and saccades.

Poster U77 – Regan Taubenheim

Mentors: Gregory Brown

Co-Authors: Sami Mauch

Title: *Do Apple watches report accurate daily physical fitness measurements?*

Smartwatches enable a wearer to access a variety of social media and productivity apps and also some apps that allow measurement of heart rate, daily caloric expenditure, or steps throughout the day. In contrast, a fitness watch is designed specifically for the measurement of heart rate and daily physical activity but does not have all of the other functions of a smartwatch. The Polar M430 fitness watch has been validated for its ability to accurately measure heart rate and daily physical activity. The 2nd generation 42-millimeter Apple smartwatch is claimed to accurately track the user's heart rate, daily caloric expenditure, and steps throughout the day, but these claims have not been validated. The purpose to this

study is to evaluate the Apple watch's ability to measure calories, steps, and heart rate compared to the Polar M430, with the goal of developing a future research protocol. Measurements will be collected from two subjects over the course of seven days for each subject. The Apple watch will be worn on the left wrist, and the Polar M430 will be worn on the right wrist during waking hours. Heart rate measurements will be collected each day at 9:00 am, 12:30 pm, 4:00 pm, and 8:00 pm. Total daily steps and calories burned will be collected before the watches are removed at night. The data for heart rate, total daily steps, and caloric expenditure will be compared using a paired t-test.

Poster U78 – Sami Mauch

Mentors: Gregory Brown

Co-Author: Regan Taubenheim

Title: *Do Apple watches report accurate daily physical fitness measurements?*

Regular participation in physical activity enhances physical fitness and reduces the risks of a large number of chronic diseases and lowers the overall risk of premature mortality. By knowing a person's physical fitness appropriate intensity and duration of exercise can be prescribed to optimize the health-related benefits of physical activity. The International Fitness Scale (IFiS) is a previously validated 5 question survey that can be used to measure perceived physical fitness. The IFiS allows measurement of an individual's overall physical fitness, cardiorespiratory fitness, muscular fitness, speed-agility, and

flexibility without requiring them to participate in a physical fitness test. It is reasonable to expect that students majoring in Exercise Science would have a greater awareness of their physical fitness than students in other majors, but this has not been evaluated. The purpose of this study is to use the IFiS to analyze whether or not exercise science majors will rate their perceived physical fitness differently than business majors. The IFiS will be administered on-line to three business classes and three exercise science classes consisting of junior and senior-level undergraduate students. The data for perceived overall physical fitness, cardiorespiratory fitness, muscular fitness, speed-agility, and flexibility will be compared between students majoring in Exercise Science and those majoring in Business to determine whether or not exercise science majors rate their perceived physical fitness differently than business majors.

Poster U79 – Derek Elton

Mentor: Matthew Bice

Title: *Correlation between Health Professionals Health Behaviors and Professional Expectations*

Health professions are important agents of information and the general public looks upon health professionals as a gold standard for health information. The goal of this project is to examine the health and wellness of health professionals and further examine the relationship between perceived and measured health and wellness constructs among health professionals. To answer the proposed research topic, a sequential mixed

method approach will be used including two phases (A) survey administration and (B) interviews of 5-6 participants who will be randomly selected from participants who participated in phase A. The methodology is designed to be completed virtually and aligns with university policies. Participants will be recruited from local health clinics, particularly those associated with my future career. After participants' consent, they will be asked to complete a quantitative survey in which they rate their own perceived wellness using a validated scale, rate how they identify as an athlete to determine their own athletic capabilities and a self-report assessment of their body composition using the Body Mass Index. The interviews will be conducted via Zoom by health professionals who participated in the phase A. Once data is collected it will be compared against known averages split by age and gender for healthy individuals as defined by the American College of Sports Medicine (ACSM) and BMI. Data will be then analyzed using SPSS. A report of the findings will be shared with participating health professionals to increase awareness and help further progress the practice of health professionals.

Poster U80 – Mikayla Brady

Mentor: Roderick Bartee

Title: *Enhancing Sense of Community in Rural Areas: A Public Health Approach*

Many rural areas suffer from a lack of community identity and a sense of social isolation. Community development is traditionally approached from an economic perspective in rural areas. Less often, rural community development is

approached through the lens of public health even though there may be greater impact due to the unique nature of these communities and the plethora of health inequities residents face. A Delphi study is being conducted with twelve leaders of a rural village in east-central Nebraska. Methods: The study consists of three rounds of surveys. The initial survey asks participants to list between 3 and 5 greatest barriers and best solutions to enhance the sense of community in the village. The answers from the round 1 survey were categorized and rated for importance on a Likert scale, serving as the round 2 survey. Using results from round 2, the round 3 survey will include a smaller number of Likert scale questions focused on greatest barriers and best solutions to enhance the sense of community. Results: Round 1 responses revealed 11 barriers and 11 potential solutions. Round 2 is currently in progress. Final results will provide consensus among participants on perceived greatest barriers and best solutions to community development. Discussion: This information will provide data to assist village leaders and citizens in continuing the community development process, building a stronger community identity and a greater sense of community. These data will also add to the minimal data on rural areas.

Poster U81 – Baylee Brownawell

Mentor: Megan Adkins

Co-Authors: Mackenzie Hamilton, Stefanie Neal

Title: *The Road to Recovery from an Anterior Cruciate Ligament (ACL) tear: Influence of Insurance Coverage and Speed of Recovery.*

One of the most prevalent injuries cited for knee injuries is the anterior cruciate ligament (ACL) tear. When surgery is required, rehabilitation by a physical therapy is completed to assist in the recovery process. Changes in health care insurance policies and coverage substantially influence the number of visits allowed by some patients, potentially influencing the level and/or speed of recovery to full function of the knee. To date, limited research has been conducted focusing on rural population ACL tear patient rehabilitation.

PURPOSE: The purpose of the research project is to evaluate the number of physical therapy visits, number covered by insurance/not, therapist notes, and knee recovery speed from an ACL surgery of patients who are from rural communities. The secondary purpose is to review age, gender (male, female, non-identifying), activity completed by the patient when injury occurred, and speed of recovery during physical therapy rehabilitation.

METHODS: The researcher met with a local orthopedic rehabilitation clinic who agreed to provide the researcher access to ACL patient medical records onsite from an online database. After University

IRB approval, the researcher reviewed patient records, with identification blinded by the clinic. Patient age, gender, resident population, physical activity status, number of physical therapy visits allotted by insurance, number of overall visits, were gathered to determine results.

Poster U82 – Jacalyn Kliever

Mentor: Roderick Bartee

Title: *Physical Activity Prevalence Among University of Nebraska at Kearney Students*

The 2018 National Physical Activity Guidelines for Americans recommend that adults are active for a minimum of 150 minutes a week of moderate-intensity activity; 75 minutes of vigorous-intensity activity, or a combination of both; and at least 2 days of strengthening exercises. According to the American College Health Association, approximately 50.1%, 29.4%, and 35.7% of college students meet the national physical activity guidelines for MPA, VPA, and strength, respectfully. The purpose of this study was to describe the physical activity prevalence among college students at the University of Nebraska at Kearney across demographic variables including gender, year in school, ethnicity, body mass index, and residence.

Methods: Participants included 521 randomly selected enrolled undergraduate and graduate UNK students 19 years of age or older who responded to the National College Health Assessment (NCHA) that was sent out via email in October of 2018. Descriptive analyses were performed using Microsoft Excel to determine the percentage of

students meeting the moderate, vigorous, and strength physical activity guidelines by demographic variable.

Results: Results revealed that 21.7%, 17.1%, and 31.9% of UNK students were meeting the National Guidelines for MPA, VPA, and strength, respectively. For each demographic variable, the percent of the sample that met strength guidelines was greater than the percent of the sample that met MPA or VPA guidelines.

Discussion: Knowing the prevalence of physical activity by demographic variables is critical to develop more targeted interventions to increase physical activity among college students.

Poster U83 – Jessica Klingelhofer

Mentor: Megan Adkins

Title: *Movement and Mindfulness: Teacher Perception of the Use of Sensory Movement Hallways*

Elementary children are brimming with energy in school, often impacting the focus in the classroom, and potentially leading to behavior problems. Schools are required to provide Physical Education, and recess breaks to help students move throughout the day, but the time spent in activity is not enough. Additionally, after children engage in physical activities, classroom teachers have to allot time to regroup and mentally prepare the children to settle down to refocus in their homerooms. Schools are becoming aware of the need to bridge movement and mindfulness activities to assist student learning, and regulating emotions by designing sensory movement hallways. Sensory hallways are designed to assist children in learning to regulate behavior before re-entering

the classroom, and allows children to use various senses and locomotor movements on “pathways” to achieve the goal. Although many schools are finding success, to date limited research has been completed related to school implementation, and teacher perceptions. The PURPOSE of the research project will be to investigate the percentage of Nebraska elementary schools who have implemented sensory pathways, and evaluate teacher knowledge, and perception of effectiveness in their classrooms.

Poster U84 – Sophie Mellema

Mentor: Kazuma Akehi

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

Deep tissue laser therapy (DTLT) has been used for the treatment of various musculoskeletal conditions, aiming to control pain and facilitate to regeneration of the tissue. However, there is inconclusive how much passive tissue mechanical resistive properties and joint range of motion (ROM) will change after the DTLT on lower extremity muscles. Objective: The purpose of this study is to examine if a 4-week of DTLT session influences passive musculotendinous stiffness (MTS) and ROM for the knee flexors groups comparing to the sham laser treatment group (SLT). Study Design: Factorial study will be used. Participants: Twelve currently active female volleyball players at the University of Nebraska- Kearney and twelve recreationally active college-aged females will be recruited. Each participant should have a chronic hamstring tightness yet

have no known musculoskeletal injuries in the dominant side of the leg in the last 6 months prior to the data collection.

Procedure: Passive hip flexion ROM and MTS will be measured using the isokinetic dynamometer at two different times (pre- and post-therapy session). Participants who are randomly assigned to the DTLT group or SLT group will experience a treatment twice weekly for 4 weeks.

Following the 4-week treatment session, participants will be back for the follow-up assessment. We hypothesized that DTLT would allow a greater increase of ROM and less MTS compared to the SLT group. Clinical Application: The results of this study can provide better clinical insights of the modern laser therapy to improve musculotendinous characteristics.

Poster U85 – Nathan Slusarski

Mentor: Bryce Abbey

Co-Author: Bryce Abbey

Title: *Oral and Maxillofacial Injuries in Sports: Review and Case Study*

In the world of sports, it is a given that there will be injuries over time in athletes. Determining the type of injury will be unknown as there is a large variety of injuries that could occur in any part of the body. Of those, oral and maxillofacial injuries are not near as common. Oral and maxillofacial injuries tend to account for a small percentage of all sports-related injuries (Gould et al, 2016). On the other hand, the number of participants in athletics is increasing which coincides with the likelihood of possible oral and maxillofacial injuries during competition (Gould et al, 2016). Oral and maxillofacial injuries can be defined in a few different ways, but in this study, they will be

defined as teeth injuries such as fractures, avulsions, and luxations, alveolar injuries, soft tissue injuries (ranging from bruising to severe lacerations), and facial skeleton and dental hard tissue injuries (Beachy, 2004).

Purpose: The purpose of this project is to analyze different cases involving oral or maxillofacial injury and understanding the details of each case as well as comparing the details of the cases and what treatment options were used on the patients.

Methods: The project will include the gathering and analyzation of archival information of oral or maxillofacial injuries in individuals participating in athletic events. Each case will be studied to determine possible treatment options and future complications.

Results: Information and data of cases is currently being gathered and analyzed.

1. Gould TE, Piland SG, Caswell SV, Ranalli D, Mills S, Ferrara MS, Courson R. National Athletic Trainers' Association Position Statement: Preventing and Managing Sports-Related Dental and Oral Injuries. *J Athl Train.* 51:821-839, 2016
2. Beachy G. Dental Injuries in Intermediate and High School Athletes: A 15-Year Study at Punahou School. *J Athl Train.* 39:310-315, 2004

Poster U86 – Bella Whiston

Mentor: Matthew Bice

Co-Author: Matthew Bice

Title: *The intrinsic and extrinsic factors that affect a female women's soccer players motivation to participate in the rehabilitation process post-injury*

Extrinsic and intrinsic factors play a major role in how an athlete stays motivated throughout the recovery process. The purpose of this study is to identify those extrinsic and intrinsic motives and how female collegiate athletes use them as motivation throughout the rehabilitation process. In this study, we will be examining collegiate female soccer teams within the state of Nebraska at all different levels, divisions I, II, and III of the NCAA and NAIA. Using characteristics from the 3 basic psychological needs of human beings (autonomy, competence, and relatedness) the Self-Determination Theory (SDT) describes extrinsic and intrinsic factors. This continuous concept exhibits the levels of both extrinsic and intrinsic types of motivation, as well as the degree of internalization. Along with the SDT, we will use a cross-sectional survey method to better understand extrinsic and intrinsic motivation types. Within the first round of surveys at the beginning of the season (during pre-season), we will begin to identify what intrinsic and/or extrinsic factors motivate them to continue playing the sport. Next, we will begin to survey injured players as the season goes on. Data from the initial survey will give us insight to how the extrinsic and intrinsic factors motivating them to play are altered upon getting injured, ultimately affecting their motivation throughout the rehabilitation process. Our goal for this study is to pinpoint what extrinsic or intrinsic factors influence an athlete to stay motivated throughout the rehabilitation process, as well as understand how these factors can fluctuate amongst varying NCAA and NAIA levels. Eventually, we hope to identify additional factors that have the ability to influence the rehabilitation

process. By understanding how athletes are motivated to rehabilitate post-injury, health care providers such as physical therapists, athletic trainers, etc. can improve this aspect of the rehabilitation process to get optimal results post-recovery.

Poster U87– Morgan Daubert

Mentor: Megan Adkins

Title: *Rethinking teacher education preparation in a pandemic crisis: The evaluation of pre-service & first year teacher competence, and confidence of social, emotional learning.*

The COVID-19 pandemic forced schools to modify learning into remote settings to maintain safety of the school population almost overnight. The purpose of the research project was to investigate Health and/or Physical Educators (HPE) perceptions of school, and oneself when teaching remotely. A sample of 179 educators across 14 states (87=M, 91=F, 1=NI) completed an online survey. The survey included 50 close-ended responses, with the option to provide additional comments. The survey was pilot-tested to establish content validity. At the conclusion of the survey, participants were invited to participate in a focus group interview to expand upon results found from the survey. Thirty teachers (12=M, 18=F) were interviewed via zoom. Data was coded, descriptive statistics analyzed. Results indicated 65% of HPE taught asynchronous with 54% of schools using Google Classroom as the LMS platform. Only 18% of survey participants felt they did not have help when transitioning to remote learning from

administrators. Primary themes found from the focus interviews indicated frustration related to technology, and student participation rates. Teachers' relationships with others was a critical factor to feel valued, and cope. Findings indicate school districts approached remote teaching in a variety of styles due to LMS platform capabilities, technology support, and demographics of the school population. Expectations of the HPE teacher varied by school. Future research should investigate school changes in remote learning strategies throughout the duration of the pandemic, all school teacher perceptions, and review curricular changes and impact on student learning.

Poster U88 – Reid Beilby

Mentors: Bryce Abbey

Title: *Recreational Athletes Supplement Use, Knowledge, and Motivation*

Many recreational athletes are consuming dietary supplements (DS) with claims that might not be true. "The fact that many adolescent athletes use DS regularly and often consume not only one DS but possibly many different supplements at the same time is alarming. Many supplements have not yet been evaluated and sufficiently tested for use by adolescents; it is also distressing that adolescent athletes seem to know very little about DS" (Diehl, et al. 2012). For most recreational athletes, they are choosing to use supplements to give them a boost in their workout routine. Most however, don't have a credible source to rely on to get information which leads to many taking unnecessary or sometimes unreliable supplements. The ability to survey, gather, and eventually share data will allow for all recreational

athletes to be better informed about various supplements.

Purpose: The purpose of this project is to collect and evaluate current supplement information and survey recreational athletes regarding their supplement usage, knowledge, and motivation.

Methods: An IRB is being completed, to all for recreational athletes using the Wellness Center to be surveyed regarding their supplement usage, knowledge, and motivation.

Results: Surveys will be evaluated for recreational athlete supplement usage, knowledge, and motivation.

Poster U89 – Noah Valasek

Mentor: Joey Eisenmann

Title: *Monitoring Training Load and Recovery in Male Collegiate Basketball Players*

For optimal performance and health and injury prevention, it is important to monitor the training load imposed on the athlete(s) and how they are responding to the training. It is becoming commonplace for high performance teams to utilize daily and weekly sports science data capture and analysis to manage the training load and recovery of athletes. During the 2020-21 collegiate men's basketball season, a Division II team completed an online recovery and wellness survey twice weekly and also self-reported rating of perceived exertion (RPE) following training sessions. For the recovery and wellness survey, athletes reported on sleep, nutrition, energy, mood, and soreness on a 1-5 Likert scale. A total wellness score was also calculated. The

session RPE (sRPE) was determined by multiplying the RPE by the duration of the training session to provide an indication of training load. Both the acute (daily and weekly) and the acute:chronic workload ratio will be reported. Team and individual weekly and seasonal trends will be visually shown and compared to other published reports on highly competitive athletes.

Poster U90 – Nia Station

Mentor: Thomas Orr

Title: *Mindfulness of Athletes*

As everyone becomes increasingly aware of the importance of mental health, it also becomes clearer the direct effects one's mental state has on their performance. I have been discussing the athletic state of mind with Dr. Thomas Orr and what can be done to encourage a more consistent and stable state mind for athletes while they are performing. The concept of becoming more literate in mindfulness is imperative for athletes to purposefully impact the way they are approaching their sport mentally.

Poster U91 – Sam Lueders

Mentor: Kazuma Akehi

Title: *Muscle strength and quality differences in collegiate competitive sprinter and long-distance runners*

The stretch shorten cycle has been used to describe running biomechanics in which muscles will load through an eccentric contraction causing a more powerful concentric contraction.

Researches also indicate that running biomechanics could better be described

by a model in which the muscle contracts isometrically in turn storing impact forces as elastic energy in tendons. The latter model would be beneficial in harnessing recoil force at a constant speed such as in long distance running while the first model may be used more to generate speed in activities such as sprinting. Therefore, muscle force character and quality of the musculotendinous unit may depend on the style of running. Purpose: The purpose of the study is to compare the effects of event specific training on the lower leg muscle strength characteristics and musculotendinous architecture between sprinters and long-distance runners. Study Design: Factorial design. Methods: Twenty male sprinters and long-distance runners will be recruited in the current study. Subjects will perform three plantar flexion on the isokinetic dynamometer and 3 single leg hops using the Tendo units and vertical jump mats to measure muscle strength. Additionally, Achilles tendon and gastrocnemius muscle thickness and quality will be measured using diagnostic ultrasound. Following 4 weeks and 8 weeks of training, each subject will revisit to remeasure their lower leg muscle strength and architecture. Clinical Application: Findings of this study will help clinicians and trainers better prescribe strength training programs for the athletes respective sport.

Poster U92 – Britney Brosius

Mentor: Kazuma Akehi

Title: *Analyzing rodeo injuries and their corresponding risk factors*

Rodeo is well known physical activity that involves high-velocity and high-impact to raiders body against uncooperative livestock. The Justin Sports Medicine Team recorded injuries at 1,939 Professional Rodeo Cowboys Association (PRCA) rodeos from 1981-2005 and reported 49.8% of injuries were from bull riding, 22.8% from bareback riding, 15.6% from saddle bronc riding, 8.0% from steer wrestling, 2.7% from tiedown roping, and 1.1% from team roping. Current data would include the addition of women's breakaway roping and barrel racing. Goat tying would be included at the collegiate and high school demographics. However, most of the previous research is regarding rough stock riding, outdated, and primarily based in Canada. Purpose: The purpose of this study is to identify and analyze rodeo-related injury frequency, location, type, mechanism of injury, phase of event, and likelihood in the central region of the United States. Method: A prospective cohort study will be utilized at rodeo competitions of different demographics in the state of Nebraska. The history of rodeo-related injuries will be recorded and compared over a certain amount of time. Clinical Application: The data collected from this study would be significant due to the lack of previous data available in the US. It could be used in the clinical setting to assist in prevention, awareness, and future research in rodeo sports medicine.

Marketing, Agribusiness, & Supply Chain Management

Poster U93 – Chloe Murphy

Mentor: Heather Meyer

Title: *Cross-Generational Consumer Behavior*

The purpose of the research study is to explore generational consumer behavior and self-perception. Generational behavior is no stranger to the public eye. In fact, numerous biases and experiences have already been formed in relation to each generation. Many have reached a state of fatigue in regard to discussing cross generational behavior. However, there is relevance for discussing such a topic, considering generations like Millennials are going to outspend every other generation in the U.S. this year, and they have the greatest lifetime value of any client one can keep. In addition, upcoming generations will be the largest ones in the workforce.

The intertwining of generations is a breeding ground for stereotypes and can force dynamic changes in the workplace and retail environment. In addition, marketers may find it difficult to connect with generations due to bias. In order to fact check the biases that have labeled each generation, this study surveys members from each current generation (Baby Boomer-GenZ). The results will inform marketers and managers to create efficient and effective marketing and management strategies that are

accommodating across generations. The survey was employed using Qualtrics and analyzed using SPSS.

Poster U94 – Jiarui Han

Mentor: Vijendra Boken

Title: *Impact of COVID-19 on Nebraska Agriculture in 2020*

Covid-19 spread rapidly in 2020 in many states including Nebraska. Many businesses, small or big, suffered significant economic losses due to the pandemic as businesses closed or remained restricted. Demand and supply chains were affected which, in turn, influenced labor force and food supply chain. As a result, pricing of agricultural produce got impacted. Besides, many elderly farmers contracted the virus and some of them died, which may have negatively impacted the agricultural operations. The present study examines the impact of COVID-19 on farming, crop yields and prices of agricultural products in 2020.

Poster U95 - Caleb Hendrickson

Mentor: Peter Longo

Title: *Two Weeks to Flatten the Curve to Most Deadly Pandemic in a Century": How COVID-19 Shaped the 2020 Election*

Voting is a way that citizens of this country are able to express their view, thoughts, and perspectives on policy & policymakers across the country. In this current system, our voter turnouts have been healthy but there is a growing movement involving opening voting to more Americans, just as there is a

movement growing against precisely that. The pandemic that is COVID-19 opened several doors for different types of voting across the country, and these types may worm their way into the constructivist norms that play a role in dictating public policy. How voting compared to the Spanish Flu or other crises in American history will be covered in this paper; additionally more progressive solutions for crisis voting will be examined.

Teacher Education

Poster U96 – Shelby Nichols

Mentor: Dena Harshbarger

Title: *Photography in Science*

My proposal combines my recently acquired interest in photography and my desire to use inquiry-based instruction in my future classroom. It involves implementing action research in a 5th or 6th grade classroom to determine how/if students' interest in a nature photograph impacts the quality of their work and depth of their science knowledge.

When students are interested and have ownership in their learning, they are often more motivated to exert effort and meet the learning objective (Contant, Tweed, Bass, and Carin, 2018). Learning behaviors stemming from intrinsic motivation often help students gain and apply scientific knowledge to new situations (Deci & Ryan, 2010).

Therefore, data will be gathered related to each student's level of interest in regard to the nature photograph that will be used

to the launch the habitat lesson and project. After I teach a lesson where the students learn about what wildlife needs to survive, the students will be given classroom materials to build a habitat for a wildlife animal of their choice. Projects will then be scored using a performance rubric. A Pearson Correlation Test will be administered using the quantitative interest scores and project scores to determine if there is a distinguishable correlation between interest and performance/knowledge. Tomlinson (2013) states that projects and assignments should create interest and empower students so that they are more invested in the learning process. Student engagement may result in increased learning and/or high-quality performance.

Poster U97 – Reid Bednar

Mentor: Chandra Diaz DeBose

Title: *Examining how rural administrators support the well-being of novice teachers.*

Current research shows a significant turnover rate of teachers after their first year of teaching in urban school districts. From this research, there seems to be a direct correlation between teacher retention and teacher support programs. Much of the research literature about teacher support programs is centered around urban school districts. This research lacks a rural, Midwestern perspective on how school administrators are supporting their novice teachers. The purpose of the exploration of school administrators' supportive approach to teacher well-being in rural and rural remote communities is to contribute to the

ongoing research covering teacher well-being and retention. This is a grounded theory qualitative framework design influenced by exploratory case studies. A purposive sampling will be used as this study seeks to focus on administrators in identified rural areas. Interviews will be recorded and conducted with three to five participants via Zoom. Following the interviews, data will be transcribed and analyzed to identify patterns among participants. Preliminary data will be shared.

Poster U98 – Luis Cordova

Mentor: Martonia Gaskill

Title: *Exploring the experiences of minority students at UNK: Cultural capital and student perspective*

With the growth of college campuses comes a growth in diversity bringing along challenges and opportunities while creating complexities often not understood by instructors and administrators. It is known that different campuses offer different types of support systems for diverse communities, from providing dedicated programs to having an office fully staffed to support and work with minority students. This study aims to gain a better understanding of the experiences that minority students have at the University of Nebraska at Kearney (UNK), while seeking to understand if students possess the cultural capital needed to be successful. The purpose of this mixed method study was to examine and understand the experiences of minority students' at UNK. The study focused on answering the following research questions:

1. Do students feel like they possess the cultural capital to succeed at UNK?
2. How do students perceive the resources and support systems available?
3. How do minority students at UNK describe their experiences on campus?

An online survey and an audio-only interview will be implemented among a group of students who identify themselves as minority at UNK. The results are preliminary. Results of this study will help faculty, staff and administrators to gain a better understanding of the experiences minority students have while pursuing higher education at UNK. The goal is also to help maximize resources and support in any area which reveals a need.

Poster U99 – Nicole Shundoff

Mentor: Jane Strawhecker

Title: *Parental Perceptions of At-Home STEM Materials for Preschoolers*

Amidst the current global pandemic, educators and parents hold concerns about lost learning for children. With the sudden shift to remote learning during the spring of 2020, parents' involvement in the education of their children increased. Science, technology, engineering, and mathematics, also known as STEM, are four unique areas of learning that work together to ultimately grow and sustain the U.S. economy. This focuses both on creating critical thinkers and forming strong skills in each of the four disciplines. Young children have the foundational understanding of science and engineering concepts. Children are

often heard asking, "Why does this happen?" "Why is it like that?" "But why?" to just about anything that goes on in their day. They show that science, engineering, and technology are natural wonders when they ask "why" questions (Clements & Sarama, 2016). The results of the research project will provide insight about parental involvement with STEM learning materials and possible curricular decisions for early childhood educators.

Undergraduate & Graduate Oral Presentation Schedule



Thursday, April 1

Room: CMCT #101

- 10:00 am --- **Baylee Miller:** *Inter-Workings of Middle Eastern Terrorism* (Mentor –Chuck Rowling)
- 10:30 am --- **Wynn Cannon:** *Online Interactions During a Pandemic* (Mentor – Tiffani Luethke)
- 10:45 am --- **Chul-Hyun Jeong:** *Synthesis and Investigation of Photophysical Properties for 1,8-Naphthalimide Derivatives* (Mentor – Haishi Cao)
- 11:00 am --- **Bailey Reigle:** *Exploration of Accessible Resources and Services For Adults with Intellectual Disabilities* (Mentor – Toni Hill)
- 11:15 am --- **Lauren Rezac:** *The Intergenerational Bonding Program (IGB) - A Pilot Study* (Mentor – Ladan Ghazi Saidi)
- 11:30 am --- **Braydon Conell:** *Community Activation: Response to AIDS in Chicago* (Mentor – Linda Van Ingen)
- 2:15 pm ----- **McKenna Vininski:** *Sex Hormones Play aCritical Role in Modulating the Immune Response to Peanut* (Mentor – Joseph Dolence)
- 2:30 pm ----- **Hadassha Tofilau:** *The Effect of High Glucose on the Cytotoxicity of the Anticancer Drug Doxorubicin on Breast Cancer Cells and Cardiomyocytes* (Mentor – Surabhi Chandra)

Friday, April 2

Room: CMCT #101

- 8:30 am ----- **Ashley Helfrich:** *Generating Followers: The Effects of Social Media on Modern-Day Political Activism* (Mentor – Satoshi Mchida)
- 8:45 am ----- **Samantha Hanks:** *Antigone Now: The Collison of Ancient Greek Theatre and Modern American Perception* (Mentor – Marguerite Tassi)
- 9:00 am ----- **Mackenzie Hamilton** *KSS NE STEM 4U-PA: an after school academic program created to improve knowledge of STEM through physical activity* (Mentor – Megan Adkins)
- 9:15 am ----- **Joshua Wetovick:** *Making Music in Alfred Lord Tennyson's Arthurian Epic, "Idylls of the King"* (Mentor Rebecca Umland)
- 10:00 am --- **Elle Zimniak:** *Exploring the Emotional Effects of Social Support: An Analysis of Online Personal Narratives about Gender & Sexual Identity* (Mentor – Tiffani Luethke)
- 10:30 am --- **Kylie Anderson:** *Reevaluating Diva Citizenship: A Comparison of Womens Voices in the Public Sphere* (Mentor – Maria O'Malley)
- 11:00 am --- **Emma Raders:** *Hybridization of Turkish Salvia* (Mentor – Bryan Drew)
- 11:15 am --- **Alea Reifenrath:** *Percy Bysshe Shelley: A Revisionist of Dante Alighieri* (Mentor – Rebecca Umland)
- 11:30 am --- **Jordan Minnick:** *Assessment of Tick-Borne Pathogens in Central Nebraska (Tri-City Area) in 2019* (Mentor – Julie Shaffer)

- 12:00 pm --- **Elijah Lynch:** *Beatrice and Her Disciples: The Divine Comedy's Influence on Werther's Lotte, Heathcliff's Catherine, and Aschenbach's Tadzio* (Mentor – Rebecca Umland)
- 12:30 pm --- **Lena Janssen:** *Building Mass Functions and Estimating Merger Rates for Calculations of Cosmic Confusion Noise* (Mentor – Joel Berrier)
- 1:00 pm ----- **Shana Schoone:** *One Woman's Story of Survival: A Narrative Investigation* (Mentor – Tiffani Luethke)
- 1:15 pm ----- **Morgan Daubert:** *The Teaching Must Go On: Health and Physical Education Teacher Perceptions of the Impact of COVID-19* (Mentor – Megan Adkins)
- 2:00 pm ----- **Haley Mazour:** *How Would Jesus Vote? Twitter, Religious Rhetoric, and the 2020 Presidential Election* (Mentor – Joan Blauwkamp)
- 2:15 pm ----- **Makenzie Petersen:** *Gender Imbalance in Curricula* (Mentor – Diane Duffin)
- 2:30 pm ----- **Lydia Behnk:** *Democratic Versus Free-Market Ideals in Nebraska Classrooms* (Mentor – Diane Duffin)
- 2:45 pm ----- **Samantha Grieser:** *Comparative Analysis of Party Polarization During the 1993 Health Care Bill and the Affordable Care Act (2009)* (Mentor – Diane Duffin)
- 3:00 pm ----- **Trenton Theis:** *Decreased Tricarboxylic (TCA) Cycle in Staphylococcus Aureus Increases Survival to Innate Immunity* (Mentor – Austin Nuxoll)

Undergraduate Oral Presentation Abstracts



Biology

Emma Raders

Mentors: Bryan Drew

Title: *Hybridization of Turkish Salvia*

There are about 1,000 species of *Salvia* distributed around the world. In Turkey, one of the most species rich areas of *Salvia*, this has led to hybridization between some species of *Salvia*. Here, we investigate two specific instances of putative hybridization between species of *Salvia* in Turkey, neither of which has previously been documented. For this project, we used PCR amplification of selected chloroplast and nuclear DNA markers and resultant phylogenetic trees to assess potential hybridization events. Two putative hybrid taxa were examined, one between *Salvia aucheri* subsp. *canescens* and *Salvia heldreichiana*, and another between *Salvia vermifolia* and *Salvia cyanescens*. These putative hybrids do not look like any other described species, but have morphological features in common with their respective hypothesized parental species.

Trenton Theis

Mentor: Austin Nuxoll

Title: *Decreased Tricarboxylic Acid (TCA) Cycle in Staphylococcus Aureus Increases Survival to Innate Immunity*

Staphylococcus aureus is a gram-positive bacterium responsible for 3 million cases of infection in the United States every year. A decrease in ATP is connected to an increase in persister cell formation, which is associated with chronic relapsing infections. The underlying mechanism of persister formation is linked to an interrupted tricarboxylic acid (TCA) cycle. While persisters exhibit tolerance to antibiotics, their role in pathogenesis remains unclear. Initial studies have demonstrated that a *fumC* knockout (TCA cycle gene) survives challenge from innate immune components - antimicrobial peptides - better than wild type *S. aureus*. Additionally, following infection in *Drosophila melanogaster*, the *fumC* knockout exhibited increased survival. These data led us to hypothesize the *fumC* knockout is better suited for survival to other components of innate immunity, leading to increased survival within a host. Next, survival to phagocytic antimicrobial factors (reactive oxygen species (ROS), reactive nitrogen species (RNS), and decreased pH) was examined. The *fumC* knockout had

increased growth in the presence of all three stressors, however no difference was observed in the presence of any single factor alone. Preliminary results have also demonstrated increased survival of the *fumC* knockout within a macrophage. Additionally, a biofilm-associated catheter infection was performed within a mouse. Following a 9-day infection, female mice infected with wild type HG003 were trending towards more frequently clearing the infection compared to female mice infected with the *fumC* knockout strain. These findings suggest that persisters not only present a challenge during antimicrobial therapy but also for the innate immune system.

Chemistry

Chul-hyun Jeong

Mentor: Haishi Cao

Title: *Synthesis and Investigation of Photophysical Properties for 1,8-Naphthalimide Derivatives*

Naphthalimide (NI) family provide many interesting fluorophores to design fluorescent chemosensors in organic and biomedical fields due to its stability and photophysical properties. As the NI core acts as electron acceptor in nature, the core can be modified with electron donor substituents to provide a red-shifted intramolecular charge transfer (ICT) band. Its fluorescence emission energy falls into the visible region and can be manipulated to have near-IR region which could be an excellent platform to probe the

microenvironment of biological systems. The NI derivatives have been utilized in the area of fluorescent sensors, anticancer and antiviral therapeutics, and bioimaging with their versatile receptibilities of diverse substituents. In our group, we are using aryl nucleophilic substitution reaction to synthesize new five derivatives of NI and investigate their photophysical properties. Different substituents on naphthalene ring and phenyl ring have been used for investigation. Photoinduced electron transfer (PET) abilities have been studied in five 1,8-naphthalimides derivatives (1-5) under various solvent condition to seek longer emission (600 – 700 nm) than human cell's typical emission (400 – 550 nm). To investigate potential for being chemical sensors, fluorescence quenching yield was characterized in four 1,8-naphthalimides derivatives (2-5).

Communications

Wynn Cannon

Mentor: Tiffani Luethke

Title: *Online Interactions During a Pandemic*

There is no doubt the global COVID-19 pandemic has affected everyone ranging from youth to college students, to parents, as well as elders. When the pandemic first started, little was known about it or how to handle it (Sheikh & Rabin, 2020). This prompted the closure of many public gathering places and caused people to quarantine in isolation from one another

to help stop the spread of the virus (Razai et al., 2020). As a result of this, much of what people do was moved online whether it was for school, work, or to socialize (Herath & Herath, 2020). Research has shown that face-to-face interactions are much more beneficial than online interactions, as face-to-face satisfies the human need to belong and feel connected (Kushley et al., 2017). With nearly all interactions occurring virtually, many people are feeling their belonging and connectedness needs are unfulfilled. As a result, negative mental health effects are rising, which includes depression, anxiety, and increased stress (Razai et al., 2020). In addition, the constant coverage of COVID-19 over social media and the news is not helping (Ahmad & Murad, 2020). The United Nations recently expressed concern that the long-term impacts of the pandemic may lead to a national mental health crisis (Gaebel & Stricker, 2020). Nearly one year since the pandemic's onset, the potential for lasting implications related to mental health as a result of long-term isolation is unknown and requires investigation. This presentation will explore relevant literature about the impacts of isolation on mental health and provide suggestions for future research about the long-term implications of social isolation during the COVID-19 pandemic.

Darian Wilson

Mentor: Jake Jacobsen

Title: *I See You and I'm Listening*

In Nebraska, we have a rich plethora of strong women during the great depression such as Mari Sandoz and Willa Cather. Unfortunately, these women felt as though they had to leave our state to advance their careers. After facing horrible backlash within Omaha and Lincoln due to many of her novels, Sandoz moved to Colorado. After Cather graduated from the University of Nebraska, she left Nebraska for Pittsburg and then New York later on. With two of Nebraska's most prominent female public figures abandoning our state, it is fair to ask why we cannot support such wonderful individuals. Another important question to ask is how can we as Nebraskans work towards fostering a new generation of strong and empowered females within our state. With the project "I See You and I'm Listening" that is our goal. We want to empower girls while they are at one of their most vulnerable ages to have the courage and tools to tell a woman from the great depression's story on the stage. By doing this, we hope that someday these girls will have the courage to speak up and tell their own stories.

Pillars: With this project we will be accessing four pillars within these adolescent girls: communication, theatre, history and sociology. The communication aspect is the part which looks to allow girls to have the capability to tell a story dear and personal to them. To facilitate this desire for the girls, we will be utilizing theatre as an artistic outlet and a tool to educate the girls on a specific way to tell

their story. To build confidence within the students we will give them the backing of historical precedent so that they can gain understanding and empathy for the situations the women they are interviewing are put in. Once these girls are put through our project we hope to have instilled a confidence boost which will greatly affect the society in which they live in and interact with allowing a change of the sociology of a number of Nebraska people. These four pillars will be the sturdy forces which uphold our new redefinition of Nebraska womanhood.

Process: We are looking to take 7th and 8th grade girls who live along the cowboy trail and are stuck in circumstances in which they are not exposed to women in leadership positions and have them interview their great grandma or a grandmother figure who would have been around during the great depression. The girls will be given a set of questions to ask the person they are interviewing while also encouraged to ask their own questions as they feel compelled. We will also ask the girls to record the interview on a phone or other device and upload it to youtube. This will allow there to be documentation of more women's life stories living in the depression in Nebraska. After the girls have completed this, we will have them come up on a Friday night and get settled in and have a dinner where the girls can get to know each other. On Saturday morning we will view each girl's interview together as a group and then we will have a writing workshop in which they will write a 5-10 minute short scene portraying a story that

their grandmother figure told. They will have all day to have it completed. On Sunday morning they get to be the directors of their own scenes and we will have theatre students from UNK audition to play the characters in their scenes. The girls will then cast after a short discussion. The girls will then have the whole day to work with the actors and tell them what they want and how they want the characters to be portrayed. They will also get to talk to a lighting designer about what colors they want and what emotions they are going for. We will also have some costumes that the girls can choose from. That evening we will allow each scene to be put on in the black box theatre that is open to the public to watch. We will also record each of these scenes and burn them on a flash drive and give them to the girls.

Elle Zimniak

Mentor: Tiffani Luethke

Title: *Exploring the Emotional Effects of Social Support: An Analysis of Online Personal Narratives about Gender & Sexual Identity*

Communication has evolved over the past three decades into something that would be unrecognizable in a world before the advent of the internet. Diverse individuals from all over can reach others who have similar interests, goals, and beliefs across the globe. This is particularly helpful for those who are unable to find emotional security through connection with others in their local communities. Individuals who are members of the LGBTQ+ community are especially at risk of feeling

unsupported, becoming isolated, or even of experiencing rejection from their families and neighbors. According to the U.S. Department of Health and Human Services (2011), stresses experienced by LGBT youth put them at a greater risk for mental health problems. Online blog communities provide a place for individuals to tell their stories and potentially reach others who are having similar experiences. This presentation first covers a literary analysis of established research showing the ground work for this project and goes on to provide a quantitative and qualitative analysis of eleven such blog posts, specifically focusing on the events leading to positive and negative emotional outcomes. Lastly, implications and suggestions for future research will be presented. This is an important area of research that has not been well investigated and has the potential to provide better understanding of or even new ways to reach populations that may benefit from greater access to emotional support structures.

Shana Schoone

Mentor: Tiffani Luethke

Title: *One Woman's Story of Survival: A Narrative Investigation*

According to the National Coalition Against Domestic Violence (2020), one in four women will experience some form of domestic violence in their lifetime. Domestic violence is violence or other abuse in a domestic setting such as marriage or cohabitation. It takes a

number of forms including physical, verbal, emotional, environmental, religious, reproductive, and sexual abuse. While some women are unable to escape their abusive relationships, others are. This presentation will explore the findings from one woman's story following her escape from an abusive relationship. Through narrative research, Amber (a pseudonym) shared her life experiences relating to her childhood, abusive relationship, and her life after abuse. The investigation of Amber's story revealed themes of poor communication, lack of trust in relationships, and unestablished boundaries. However, it also highlighted positive coping strategies that empowered her to survive including sharing her story with others, building healthier relationships, and finding healthier ways of managing her mental health problems that resulted from the abuse (i.e., depression, anxiety, and post-traumatic stress disorder). Implications of Amber's story and directions for future research will also be discussed as a part of this presentation.

Communication Disorders

Lauren Rezac

Mentor: Ladan Ghazi Saidi

Co-Author: Miechelle McKelvey

Title: *The Intergenerational Bonding Program (IGB) - A Pilot Study*

Social isolation and loneliness can be identified as detrimental risk factors to

one's general health and well-being. Given the current situation of the COVID-19 pandemic, these occurrences are anticipated to rise. An individual can experience negative psychological and physical effects of having an isolated lifestyle and decreased social activity (Budzynski-Seymour et al., 2019). This phenomenon can be seen in older and younger adults. A lack of social interaction may even increase the chances of depression and anxiety (Boru, 2017).

This study aims to investigate the psychological, cognitive and communicative effects of an intervention based on an Intergenerational Bonding Program (IGB) with older adults. Participants include students aged 19-29 at the University of Nebraska at Kearney and older adults over the age of 60. The design is quasi experimental Pre-Post intervention. For efficient intervention, participants are required to meet via telepractice (Zoom) 30 minutes for a total of 12 times (six weeks, two days a week).

The IGB Project is ongoing and the interventions with older adults are still in progress. Data analyses will include qualitative analyses of feasibility of the program and acceptability of the intervention. Further, quantitative analyses (repeated measure t-test) will be used to compare the results of pre- and post-assessments. Qualitative and quantitative analyses of the pilot will be presented upon completion of the intervention. Continuation of this project is possible in the future through collaboration. Assisted living and nursing

home facilities could benefit from implementation of this project as an offered activity.

English

Elijah Lynch

Mentor: Rebecca Umland

Title: *Beatrice and Her Disciples: The Divine Comedy's Influence on Werther's Lotte, Heathcliff's Catherine, and Aschenbach's Tadzio*

There was a time where love was best defined by its suffering, how much one's absence or presence destroyed and deafened the artist's world. This time was one of simple loves, of familiar images in now familiar forms (poems of birds singing in trees, of dreams of togetherness). Dante, with his muse Beatrice, created a new kind of love. It was no longer just a representation of wants, descriptions of picturesque images, and undivided attention. Love became its own figure, a representation beyond a simple love's mortality. Love no longer was restricted by suffering or pain but could be its own escape, could empower and transform to levels matched only by divinity.

In the years following Dante's landmark *Commedia*, many more love stories would come and go and many would consider and reconsider Dante's legendary image of the muse. Johann Wolfgang von Goethe would consider what a muse might be for another type of artist in another time in *The Sorrows of Young Werther*; Emily Brontë would create a muse far removed from heavenly or

divine sentiments in the form of Catherine in *Wuthering Heights*; and figures like Thomas Mann would reimagine this relationship in new contexts with the boy-muse Tadzio in *Death in Venice*. All hold onto the attachment and power that embodied Beatrice, and all hold context in a Romantic tradition worth exploring through today – how they take and redefine what it means to be a muse, how they connect as disciples to the Beatrice that came before.

Joshua Wetovick

Mentor: Rebecca Umland

Title: *Making Music in Alfred Lord Tennyson's Arthurian Epic, "Idylls of the King"*

Alfred Lord Tennyson's *Idylls of the King* is not only a rich and widely-celebrated retelling of the Arthurian legend, but also a Romantic tale of the mysticism and charm of music. For my project, "Making Music in Alfred Lord Tennyson's Arthurian Epic, 'Idylls of the King'", I am researching and analyzing music in Tennyson's *Idylls of the King*. My areas of research and analysis fall under three main points: Tennyson's foundations in music and the music of his era, structural analyses of the songs from musical and poetic perspectives, and analyses of the songs within the context of their idylls and their relations to the work as a whole. My analysis is unique because, as a trained musician, I can approach the work from both a literary perspective and a musical perspective. There have been some scholarly works about music in *Idylls of*

the King, but the topic is largely unexplored. I intend to not only offer my analyses of the sparsely discussed topics, but also of the unexplored musicality of the work.

Jordan Minnick

Mentor: Marguerite Tassi

Title: *White Feminism in Poetry: A Study of Sylvia Plath's Work as a White Woman in Patriarchal Society*

Alfred Lord Tennyson's *Idylls of the King* is not only a rich and widely-celebrated retelling of the Arthurian legend, but also a Romantic tale of the mysticism and charm of music. For my project, "Making Music in Alfred Lord Tennyson's Arthurian Epic, 'Idylls of the King'", I am researching and analyzing music in Tennyson's *Idylls of the King*. My areas of research and analysis fall under three main points: Tennyson's foundations in music and the music of his era, structural analyses of the songs from musical and poetic perspectives, and analyses of the songs within the context of their idylls and their relations to the work as a whole. My analysis is unique because, as a trained musician, I can approach the work from both a literary perspective and a musical perspective. There have been some scholarly works about music in *Idylls of the King*, but the topic is largely unexplored. I intend to not only offer my analyses of the sparsely discussed topics, but also of the unexplored musicality of the work.

Sammantha Hanks

Mentor: Marguerite Tassi

Title: *Antigone Now: The Collison of Ancient Greek Theatre and Modern American Perception*

“Antigone Now: The Collison of Ancient Greek Theatre and Modern American Perception” analyzes the adaption and translates of Sophocles’ Antigone in Melissa Cooper’s Antigone: Now. The analysis to further understand the distinctly modern American presentation of the themes of feminism, rebellion, and tyranny. This examination is done through dramaturgical analysis of the source material Antigone, scholarly historical research articles, and scholarly analysis articles. Historical information gathered included ancient Greek theatre practices, Athenian democracy, and production history of Antigone. This is done to give a well-rounded view of the source material and its previous presentation when deciding how to present Antigone: Now.

Based off the information gathered, a design concept for a live theatrical production of Antigone: Now is created. This concept comes from the viewpoint of Antigone in 2021 America while also blending traditional Greek theatrical practice. This blending allows the audience to experience Greek theatre in a modern setting that speaks directly to the current American culture and political climate. Elements considered in concept design are blocking, setting, lighting, sound, costuming, and characterization. These elements are chosen to create a theatrical production with a unified look and feel to further project the themes

examined in the dramaturgical analysis. This production is then performance is then a small audience for a final analysis of the effectiveness of the implementation of the design concept in action.

Family Studies

Bailey Reigle

Mentor: Toni Hill

Title: *Exploration of Accessible Resources and Services For Adults with Intellectual Disabilities*

There is a lack of adequate research regarding the intellectual disability (ID) population. This population has different needs than other populations which is why there needs to be more research done in this area. The resources that this population receives (e.g., Day programs, Special Olympics) have been shown to increase the lifespan of these individuals (Ervin, et. al., 2014). This pilot study examines services and resources that exist and what resources are needed. This presentation will focus on existing resource and service issues for adult individuals with intellectual disabilities and the benefits of those resources. The purpose of this research study is to explore resources for individuals with intellectual disabilities in all communities whether they are in urban or rural Nebraska. To explore this research question, surveys were administered to parents of individuals over the age of nineteen years that have an intellectual disability.

Kinesiology & Sports Sciences

Morgan Daubert

Mentor: Megan Adkins

Co-Authors: Shannon Mulhearn, Thomas Orr, Stefanie Neal, Mackenzie Hamilton

Title: *The Teaching Must Go On: Health and Physical Education Teacher Perceptions of the Impact of COVID-19.*

Schools recognize the importance of helping children manage their emotions by teaching social-emotional learning (SEL) competences. All SEL skills have become relevant, and important since the pandemic with the continued emotional stressors of daily life. However, to date limited studies have been completed on pre-service and beginning teachers in relation to SEL. A survey study was completed to examine University pre-service teacher's (PT), and first year teacher's (FT) perceptions, competence, and University preparation related to SEL. The research also evaluated change in SEL perceptions before and during the COVID-19 pandemic. PT and FTs from four states (N=168; 63=PS, 105=BT) responded to an online survey regarding how prepared they felt to educate youth about SEL skills, their own perceptions, and gaps in teacher preparation. Results indicate all teachers felt SEL was important, even more now since COVID. Professional development, and University course work to support SEL implementation, especially in the promotion of student SEL, specifically in

self-management, would be helpful. The results of this study offer insight into SEL and could be utilized by Universities to determine curriculum related to SE learning and application for pre-service teachers. Further research should evaluate current policies related to initial certification of teachers and ability to demonstrate successful teaching of SEL to youth.

Management

Cole Chancellor

Mentor: Susan Jensen

Co-Author: Seth Taylor

Title: *Coping with COVID-19: How Central Nebraska Business Owners Responded to Crisis*

The COVID-19 pandemic has created unprecedented challenges for business owners. The purpose of this study is to better understand how business owners in the tri-city region of Nebraska (including Kearney, Holdrege, Lexington, Grand Island, and Hastings) have responded to these uncertain times and if a crisis management plan was used. The questions asked in this research are meant to determine:

- If small business owners in the tri-city region of central Nebraska had crisis management plans in place prior to the pandemic.
- What (if any) benefit was gained from the implementation of those crisis management plans

- How the pandemic has impacted the business.
- Strategies and actions taken by business owners during the pandemic.
- The business owners' outlook regarding recovery from the crisis.

Data will be obtained by a Qualtrics survey distributed by email that is designed to answer our research goals. The survey will be sent to businesses by the local Chambers of Commerce located in Kearney, Grand Island, Holdrege, Lexington, and Hastings. We anticipate approximately 200 potential survey respondents who will represent owners and/or managers of businesses in the tri-city region.

Physics, Astronomy, and Engineering

Lena Janssen

Mentor: Joel Berrier

Title: *Building Mass Functions and Estimating Merger Rates for Calculations of Cosmic Confusion Noise*

Compact objects such as white dwarfs, neutron stars, and low mass black holes captured by supermassive black holes, which sit at the center of galaxies with masses over 10^6 solar masses or greater, generate a background noise in gravitational waves that affects the Laser Interferometer Space Antenna (LISA) and Laser Interferometer Gravitational-Wave Observatory (LIGO) observations. We

discuss a way to calculate the capture rates by supermassive black holes in an attempt to describe the gravitational waves that will be detected as this background noise in the universe. In order to do this, we calculate the number of black holes in space as a function of mass across cosmic time and the number of merger events per unit time.

Tucker Greni

Mentor: Diganta Dutta

Title: *The Development of Microfluidic Devices*

In this study, we explored the usage of using pencil lead graphite to affordably fabricate microfluidic devices. The pencil lead allowed for consistently straight and easy to make devices while being able to provide constant results at the testing stage. We ran simulations to better observe the behavior of the sample fluids within the device and used microscopy imaging to visually see the movement in the channel. From the simulations we ran we were able to find that when a direct current was applied to the sample fluid it influenced the velocity of the fluid. Without pressure driven flow, after one second into our simulation we saw a relatively large change in the fluid velocity. When 1 volt was applied the max velocity observed was $100 \mu\text{m/s}$ whereas when 7 volts were applied we saw a max velocity of $5000 \mu\text{m/s}$ for an increase of 50 times over the 6 volt increase. For our alternating current we held the voltage constant and only changed the frequency. At 10 Hz the max velocity was $.25 \mu\text{m/s}$ whereas at 100 Hz the max velocity was $25 \mu\text{m/s}$ for an increase of 100 times.

When the voltage is increased for direct current or when the frequency was increased for alternating current the fluid would move much faster in the channel. We were also able to find from the simulations that when two sample fluids are pumped into the channel they would mix differently based on the voltage and the frequency used.

Political Science

Ashly Helfrich

Mentor: Satoshi Machida

Title: *Generating Followers: The Effects of Social Media on Modern-Day Political Activism*

Throughout the development of industrialization and technological growth, the modern world has seen an influx of trends relating to Internet usage and specifically, social media usage. Social media has become an increasing factor in how individuals live their day to day lives, including how they receive their news and information. Political organizations and movements use this new technique to their advantage, and it is crucial to study the effects of these strategies on their support mobilization and the spread of what the movement stands for. Variations – including demographics, the platforms an individual has social media accounts on, the amounts of time that they spend on those accounts, the diversity of their “followers” or family members, and the nature of political and social movement posts that they are exposed to – can all

affect how aware an individual is with a particular social movement and entice them to join such a movement. Specifically, throughout 2020, there has been an increase in political protests and movements, including Black Lives Matter, that have shaped American domestic affairs. A large portion of these protests were spread by word of mouth and through social media posts on various platforms. Individuals are becoming increasingly aware of political issues through the vocalness of their peers and other accounts on social media platforms. To examine this, I ask the specific research question: How has the emergence of social media throughout the 21st century contributed to social activism and awareness of specific movements, such as Black Lives Matter?

Baylee Miller

Mentor: Chuck Rowling

Title: *Inter-Workings of Middle Eastern Terrorism*

The Inter-Working of Middle Eastern Terrorism analyzes the different terrorist groups in the Middle Eastern region, while briefly covering the history of the groups as well. Next, I look over motivations for the groups, whether it be religion or secular justifications or a combination of both. Third, I examine the goals of the group. Fourth, I provide an overview of tactics. Fifth, I evaluate the recruitment process and composition of the group. Lastly, I provide a prescription to the threat terrorism possess to the United States and other democracies.

Haley Mazour

Mentor: Joan Blauwkamp

Title: *How Would Jesus Vote? Twitter, Religious Rhetoric, and the 2020 Presidential Election*

Religion has always played a role in politics in the United States. In the last 30 years, the division and polarization on both partisan and religious lines has only increased. As a result, Presidential candidates have identified their religious bases and often use specific rhetoric to cater to them and their policies of interest. In this project, I analyze religious rhetoric in the tweets of the two major political party candidates for President, Donald Trump and Joe Biden, to identify patterns in both tone and content. This project builds an important foundation for a larger understanding of how religion and religious rhetoric influenced the results of the 2020 Presidential election, and the role religion plays in American politics in general.

Samantha Grieser

Mentor: Diane Duffin

Title: *Comparative Analysis of Party Polarization During the 1993 Health Care Bill and the Affordable Care Act (2009)*

The purpose of this research is to understand party polarization at the committee level in Congress. My research project will explore party polarization during the 1993 Health Care bill and the Affordable Care Act (2009). Then party polarization in during these times will be compared with each other. To achieve this goal, different books and articles

were read. "It's Even Worse Than It Looks" by Thomas E. Mann and Norman J. Ornstein, Chapter 3 of "Committees in Congress" by Deering and Smith, and an overview of Poole and Rosenthal's measurement of party polarization will be explored. To find out which committees were involved with amending and passing parts of the 1993 Health Act, the 1993 Congressional Quarterly Almanac was used, along with Congress's website. For the Affordable Care Act (2009), the online edition of CQ Almanac was used. Then committee rosters were obtained, and a tally was completed to find the 'yays' and 'nays' that were said to pass a part of the bill at the committee level. The collection of DW Nominate Scores and member's votes were compiled into a sample size. This sample size was then used in statistical tests to demonstrate whether or not there were differences between the committees. In addition to the fact that party is a driving force at the committee level.

Makenzie Petersen

Mentor: Diane Duffin

Title: *Gender Imbalance in Curricula*

The last forty years have sparked quite a concern for national involvement in high school curricula. From Reagan's 1983 A Nation at Risk to Obama's 2009 A Race to the Top, we have seen an increased administrative focus on the standardization of classroom curricula. Right now, school districts in the state of Nebraska have their own individual systems for selecting curricula for their

classrooms. All focus on the fulfillment of the Nebraska Department of Education State Standards. While much of the literature would note that an increased standardization of curricula would be detrimental to the autonomy of teachers, a question comes to the surface: if there is not a standardization that covers the fundamental teachings of a gender-balanced curricula, does it get fulfilled? The overarching purpose of this research was to assess how much of the English Language Arts and Social Studies curricula actually being taught expresses female-based views compared to male-based views. The data was collected through an electronic survey to all English Language Arts and Social Studies educators teaching grades 9-12 in the state of Nebraska. The survey resulted in 398 usable responses, of which, 40% (or 158 of 398) of all respondents disagree/strongly disagree with the statement, "I feel as if my curriculum is balanced gender-wise within my classroom" and 21% (or 83 of 398 respondents) neither agree nor disagree. This trend of gender imbalance favoring males to females is significant specifically in the data from Social Studies educators, but also prominent in English Language Arts.

Psychology

Blase Rokusek

Mentor: Krista Forrest

Title: *Official Misconduct, Racism, and the Length of Time from False Conviction to Exoneration*

We investigated the interaction of official misconduct (OM) committed by criminal justice officials and race of the defendant in the context of the length of time from conviction to exoneration. We included in our study cases from 1989 to 2020 from the National Registry of Exonerations (NRE), which compiles in its database exonerations accomplished both with and without DNA evidence. Analysis revealed that there does exist an interaction effect of OM and race of the defendant. The timeframe from conviction to exoneration was longest when the case involved both OM and a Black exoneree. An interaction effect with time also emerged. Our results indicate that both official misconduct and exoneree race are important factors in the exoneration timeframe.

Sociology

Alea Reifenrath

Mentor: Sandra Loughrin

Title: *The Effects of Exposure to Diversity on Actively Open-Minded Thinking*

Previous research suggests that exposure to diversity influences cognition and behavior in a variety of ways. By challenging assumptions and biases, it has also been found to enhance cognitive flexibility. Another important aspect of cognition that exposure to diversity may impact is the capacity for actively open-minded thinking (AOT). AOT refers to the habit of seeking out various points of view, and examining evidence that goes against one's personal beliefs. Because exposure to diversity has been found to influence aspects of cognition such as cognitive flexibility, it is possible that it also influences AOT. However, no research has been done to examine this possibility. In this study, quantitative methodology was used to examine if exposure to individuals of different racial backgrounds, sexualities, and levels of ability can affect the actively open-minded thinking of college students. Participants were asked to complete a survey, based on the Actively Open-minded Thinking scale, to measure their disposition to flexible thinking and their ability to reason in an unbiased manner. Exposure to diversity will be operationalized as the extent to which the participant interacts with individuals of different racial backgrounds, sexualities, and levels of ability, which will also be assessed through survey questions. Based on

previous research, I hypothesize that higher levels of exposure to diversity will be associated with higher levels of actively open-minded thinking. Results are pending.

Teacher Education

Lydia Behnk

Mentor: Diane Duffin

Title: *Democratic Versus Free-Market Ideals in Nebraska Classrooms*

A critical look is needed at the education our students are earning. Throughout the history of education, reforms have shaped the way our classrooms operate; this critical look in classrooms will be dissecting the democratic approach to education versus the free-market approach to education and how those ideals are reflected in the classroom. Educators hold the responsibility of shaping the future generation, and we must ask ourselves, are we shaping students to be citizens—democratic education—or shaping them to be consumers—free-market education. The purpose of this research is to unveil what is happening right here in Nebraska schools and delve into how we are preparing our students for a future we don't yet know what holds. To understand these concepts, my research has included diving into texts from theorist of both reforms to build a foundation of what to look for, the differences of each, and the ideals that drive them. I will be compiling a list of the aspects and teaching methods that are represented in

each reform and forming survey questions from this data. A survey will be sent to Nebraska educators to better understand what is happening in our education and the implications each method has on students' futures. The results from this research will help better construct a conclusion if we are cultivating citizens or consumers and what the effects of each could mean for our society and students.

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