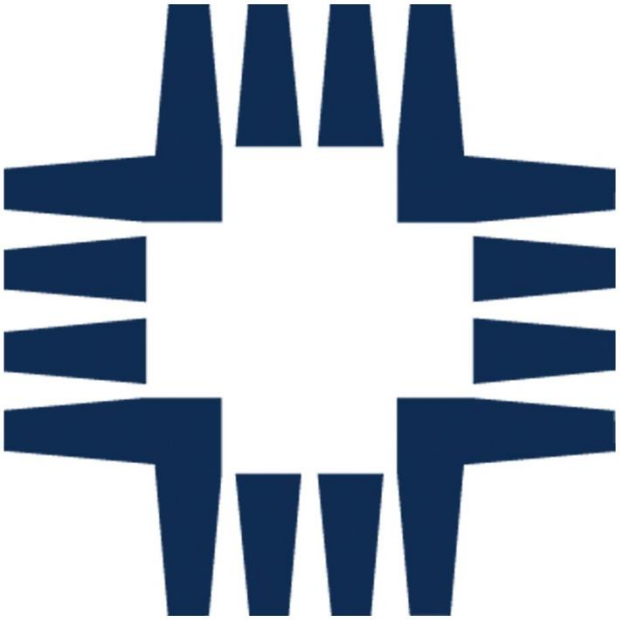
13th Annual

Academic and Research Symposium

Concordia University, Nebraska

April 22, 2024



ACADEMIC AND RESEARCH SYMPOSIUM – PRESENTER SCHEDULE

	Dunklau Lobby	Dunklau 142	Dunklau 144	Dunklau 143	Dunklau 151
2:30 PM - 3:30 PM	**Poster Session A** Miriam Ganoung Taberah Schmidt Seth Moore Michael Grindey Mason Edwards Stephen Hughes Justin Ningen Brevin Damrow Darien Semedo Lindsay Palmer Ellie Jander Kyle Berg Ethan Kirby	**Oral Session A1** Micah Willweber Gwendolyn Gaunt Anne Aschmann	**Oral Session A2** Nick Sazama Alec Blakestad Alexander Johnston Travis Parsons		**Oral Session A4** Mattie Stillahn Brooke Townsend Matt Hawes Halley Shade Larissa Embree
3:40 PM - 4:40 PM	**Poster Session B** Avery Lewis Bethany Thomas Elizabeth Marsh Taylor Johnson Josh D'Ercole Josh Bergt Joel Rathe Emily Morse Joshua Meyer Rachel Otten Rylee Ladd Lexis Haney	**Oral Session B1** Philip Norton Devon Reitz Anna Grass	**Oral Session B2** Chloe Dahn Anne Aschmann Mollie Urkoski Karsten McCarter	**Oral Session B3** Buchannan Tietjen Nathaniel Mueller Stephen Duffy Manuel Rodriguez	
4:50 PM - 5:50 PM	**Poster Session C** Julie McIntyre Thomas Gorline Kellie Rhodes Kassidy Johnson Gabrielle Nordaker Josh D'Ercole Katie Stachura Amira Cummings Claire Kee Jessica Ciezki Kamryn Pokorney Nathan Kurth	**Oral Session C1** Jaxon Weyand Luke Johnson Lindsay Palmer Hope Nelson	**Oral Session C2** Molly Roberts Macy McClain Henry Gaertner Jordan Koepke		
6:00 PM - 7:00 PM	**Poster Session D** Hunter Cole Madelyn Graham McKenna McSpadden Charlie Hayden Walker Ranada Tristin Kinderknecht Bradyn Whittington Justin Otten Jennifer Katz Jackson Lindburg Jonathan Grass Samuel Richling Joey Grabanski	**Oral Session D1** Nathaniel Demlow Creighton Taylor John Merritt Nathan Pennekamp			

Special Thanks

Thank you to all presenters, faculty sponsors, staff, judges, administrators, and attendees for supporting the symposium!

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Poster Session A

Monday April 22, 2024 **2:30-3:30p** **Dunklau Lobby**

Nebraska State Parks and Recreation Areas: Distribution and Visitation

Miriam Ganoung

Faculty Sponsor: Joel Helmer

Nebraska: the good life is outside. 1.2 million acres in the form of state parks and recreation areas across Nebraska are owned and protected by the state for conservation and public use. Annually, these areas attract thousands of visitors who come to camp, hike, fish, and hunt in the great outdoors. These visitors may be local to Nebraska, but a percentage also come from out of state. This research examines how the parks and recreation areas in Nebraska are distributed, which attract the most visitors, and how many of those visitors come from out of state. The Nebraska Game and Parks Commission can use this information as they look to make improvements to their facilities. Areas with lower visitation may need to expand their recreation options or upgrade their amenities. Higher visitation may require more state funding.

The Effectiveness of Dry Needling for Musculoskeletal Pain

Taberah Schmidt

Faculty Sponsor: Nolan Harms

Dry needling is a therapy technique used by physical therapists throughout the country to target myofascial trigger points in order to reduce musculoskeletal pain. Researchers differ on their opinions on whether dry needling is an effective treatment. Studies have found that a stand-alone treatment is not as effective as other treatment options. Dry needling can be an effective treatment in areas that can be hard to stretch or manipulate. This treatment is effective in short-term evaluation and the immediate improvement of the pressure pain threshold.

American Born National Hockey League Players: A Spatial Analysis

Seth Moore

Faculty Sponsor: Joel Helmer

Over the last fifteen years, the sport of hockey has seen a rapid increase in popularity throughout the United States. This increase in popularity has led to the league adding two more expansion teams on American soil within the past eight years. As a result of this growing popularity, the United States has seen a rapid increase in the talent level produced across the country. This research examines the growing trends of NHL players born in the United States. Utilizing data from each respective season's roster, I was able to compile the hometowns of NHL players from present day, as well as five, ten and fifteen years ago. The comparison of these datasets puts into perspective the extent to which the National Hockey League has gained popularity over the past decade and a half. This research showed the increase in the overall amount of American born NHL players over each five year span. When examining the analysis of this data it is clear to see the tremendous growth in popularity the sport of hockey has seen over the last fifteen years.

Creating F.A.S.T Athletes: An Analysis of Training Quick and Explosive Movement

Michael Grindey

Faculty Sponsor: Nolan Harms

When coaches are asked what they desire in their athletes, a normal response tends to sound like the following: "I want them to play fast." Now what exactly does that mean? Some people believe it to be purely genetic; however, this presentation seeks to present the possibility of actually training this athletic quality. The research shown will look at an athlete's response to training force production, agility, max velocity speed, and muscular endurance. These four qualities are what ultimately will create a F.A.S.T athlete.

Using GIS to Analyze the Invasion of Feral Swine in the United States

Mason Edwards

Faculty Sponsor: Joel Helmer

Feral swine cause up to $2.5 billion in damages annually to U.S. agriculture, making them one of the most economically impactful invasive species. Originally introduced to North America in the 1500s by Spanish explorers as a potential food source, feral swine have since proliferated across the continent, wreaking havoc on natural ecosystems, croplands, pastures, and livestock operations. Recent studies suggest that six and nine million feral hogs roam wild across 42 states and territories. Understanding the geographic spread of feral swine populations is crucial for effective management and mitigation strategies. This project utilizes Geographic Information Systems (GIS) to comprehensively map the distribution of feral swine populations across the United States.

Birthplaces of US Political Leaders

Justin Ningen

Faculty Sponsor: Joel Helmer

The United States has been a country for less than 250 years. However, it has changed drastically in its brief time as an independent nation. This project maps how, as the country has evolved, the birthplaces of its presidents, vice presidents, and leaders of the senate have as well. The United States expanded rapidly, but what areas dominated the political landscape? This project and its accompanying data, chart the birthplaces of the presidents, vice presidents, and leaders of the senate who would shape American policies, and how they have branched out as the country has grown and changed over several centuries. Results show that the United States has not only settled from coast to coast, some of its most important and vital leaders have been a part of the “migration” west.

An Analysis of Nebraska Public Schools: Teacher Compensation and Classroom Populations

Brevin Damrow

Faculty Sponsor: Joel Helmer

Where in the state are teachers paid the most and least, and are their underlying factors as to why? In which school districts could the student population feel too crowded for already overwhelmed teachers? Several features such as each district's student population, student-to-teacher ratio, average teacher salary in each district, have been mapped. The visualizations provided along with the data enhance and further reinforce the diversity and disparity throughout the Nebraska public schools system. The results reflect the wide range of public school districts throughout the state of Nebraska, but also show some similarities and patterns. The state of Nebraska is very diverse just as its public school districts when it comes to teacher salaries, and class room sizes.

Are Parasocial Relationships a Part of Content Creators' Future?

Darien Semedo

Faculty Sponsor: Benjamin Hinckfoot

Social media is an essential tool used by celebrities and influencers to connect with their fans and having a strong connection is important to create a community that will support them. This support leads to business opportunities like sponsorships, and even direct investments from fans depending on the influencer's background. But what happens when the connection between a fan and their influencers seems more real than it is? The Covid-19 Pandemic left people in a mandatory quarantine, isolating people from one another. This isolation caused people to have feelings of loneliness due to a lack of social interaction. In response, people began to connect digitally with one another to supplant in-person social interaction. Parasocial relationships are formed between a media figure and a follower who interact, leading to the follower believing they have a genuine relationship with the figure. These beliefs can lead to intense loyalty towards media figures, even though the figure does not truly know of their existence. The research conducted aimed to uncover the potential in parasocial relationships for future content creators.

A Spatial Analysis of Chronic Wasting Disease in the United States

Lindsay Palmer

Faculty Sponsor: Joel Helmer

Chronic Wasting Disease (CWD) is a terminal, neurodegenerative prion (misfolded protein) disease affecting members of Cervidae, such as deer, moose, and elk. This project shows the distribution of CWD across 31 states. These maps are made only with current, official data from the United States Geological Survey and the Environmental Systems Research Institute (Esri) and processed through ArcGIS Online.

Dam Aging: The History and Future of Dams in the United States

Ellie Jander

Faculty Sponsor: Joel Helmer

The peak dam-building era in the United States was between 1920 and 1970, resulting in the construction of 91,804 dams. These range from small, privately owned projects to massive federal plants. The average age of dams in the United States is currently 61 years. This project explores the distribution of major dams and focuses on their age. The data is derived from the National Inventory of Dams, which is regulated by the U.S. Army Corps of Engineers. The importance of this research is twofold. First, it shows a correlation to current dam removal projects. Second, it encourages individuals to consider the source and future of energy in the U.S. and how decisions made in the past will affect the ecosystems and livelihood of Americans in the future.

Calm Amidst Chaos: Understanding the Influence of Pressure on Athlete Performance and Mental Resilience

Kyle Berg

Faculty Sponsor: Benjamin Hinckfoot

With the game on the line in the bottom of the 9th inning, you have bases loaded with 2 outs and you are at the plate. How will you respond? Will you let the pressure of the situation get to you? Or will you be cool, calm, and collected? This literature review delves into how pressure impacts athletes in sports, affecting their performance and mental well-being. Research has explored various pressures, such as competition and audience expectations. This study aims to examine how athletes are impacted by psychological, physical, and environmental factors. By understanding how to help athletes perform better under pressure,

coaches, parents, and athletes themselves will be able to adapt and perform at their best in high-pressure situations.

Mapping the Future: Addressing Parking Challenges at Concordia University Nebraska

Ethan Kirby

Faculty Sponsor: Joel Helmer

If you frequently drive to and from Concordia University Nebraska's campus, you are aware of the parking situation and how frustrating it can be to find a spot. The data used for this project is from personal fieldwork in finding the number of parking spots and "hot spots" where parking is in demand. Data was also collected from Concordia University's Buildings & Grounds with information on the average number of drivers on campus daily. This project will be comprised of an ArcGIS map with the current parking areas on and around campus, labeled appropriately, and an ArcGIS map of proposed parking of both new parking lots and more efficient parking in existing areas. The poster will provide the reader with a clear picture of the currently available parking on campus, and a proposed plan to help solve the parking crisis that affects everyone on Concordia University Nebraska's campus.

Recruitment in High School Athletics

Stephen Hughes

Faculty Sponsor: Benjamin Hinckfoot

High schools should be allowed to recruit players because colleges engage in similar practices. If an athlete's goal is to compete at the collegiate level, then exposure to competitive environments and recruitment processes at the high school level can help prepare them for higher-level competition. Additionally, recruiting talented players can enhance the overall competitiveness and quality of high school sports programs, benefiting both the athletes and the schools. Therefore, adopting recruiting practices similar to those of colleges can provide opportunities for talented athletes to pursue their goals and contribute to the growth and success of high school sports programs.

Poster Session B

Monday April 22, 2024 **3:40-4:40p** **Dunklau Lobby**

Investigating novel anti-malarial metabolites from Clerodendrum polycephalum and their comparison with chloroquine and human heme porphyrin: an electron calculation study

Avery Lewis

Faculty Sponsor: John Jurchen

Four compounds from the plant Clerodendrum polycephalum were previously shown to have medicinal activity against Plasmodium falciparum parasites. Electron structure calculations were performed to compare their microbial activity against the standard medication, chloroquine. A comparison between the most active metabolite, methyl pheophorbide A, and porphyrin ligands found in human hemoglobin were made to evaluate potential mechanisms of action against the parasite.

Photoinduced cyclization of aryl azides to indole using electron structure calculations

Bethany Thomas

Faculty Sponsor: John Jurchen

Blue light can transform aryl azides into indoles within living cells. An understanding of the molecular orbitals active during this process allows for a stronger understanding of the processes of protein labeling and click chemistry. Electron structure calculations were performed to find the molecular orbitals that are most likely to contribute to the transformation of the azide group to an indole via click chemistry. Calculations indicate that the molecules are more likely to form an indole if a triplet azide is used rather than a singlet azide.

Polar Bear Dens and Arctic Sheet Ice Fluctuations From 1980 to 2015

Elizabeth Marsh

Faculty Sponsor: Joel Helmer

The Arctic Sea Ice's minimum extent is quantified annually each September and is dropping by 12.2% each decade according to NASA. Two months later, female Polar Bears (*Ursus maritimus*) travel to their dens to deliver and raise their cubs. Many dens are built on the Arctic Sea Ice. However, as the ice fluctuates, so do safe locations where dens can be built. As a result, many females now form their dens on the mainland. The National Snow and Ice Data Center (NSIDC) has recorded fluctuations in the cryosphere since 1976. This study compared the location of these dens to the minimum ice formation in September from 1990 to 2015. Results show how the ice formation affects where female polar bears can den and raise their young. Polar Bears are dependent on the Arctic Sea Ice throughout their life, and as it decreases, so does their reproductive success.

Navigating the Skies: Exploring the Rise of Drones Reports

Taylor Johnson

Faculty Sponsor: Joel Helmer

Drones, also known as Unmanned Aircraft Systems (UAS), have taken flight in popularity, with a noticeable increase in related reports. From 2021 to 2023, these reports have reached an all-time high at 2,595 reports in 2021 according to the Federal Aviation Administration (FAA). This makes us wonder, why the reports are at an all-time high? This study examines this drone surge, aiming to uncover its causes and spread. Additionally, we're focused on educating about drones and how to use them safely. Through research, we seek not only to grasp the reasons behind the rise in reports but also to encourage responsible drone practices. Join us as we navigate the skies of innovation and safety in the ever-evolving world of drones.

Fairway to Fairway: Mapping the 2024 PGA Tour Stops

Josh D'Ercole

Faculty Sponsor: Joel Helmer

The game of golf skyrocketed in popularity during the COVID-19 pandemic. The PGA Tour saw their opportunity to revamp their schedule to make it more travel friendly and bring in more money. The PGA makes it seem like they travel all over the United States but when taking a deeper look into where the PGA plays at something interesting comes up. It appears that the PGA Tour has a preference on where in the United States they play at and during what time of the year. Looking at the PGA Tour's website is how information was obtained about the current PGA schedule. From coast to coast, it maps out the strategic spacing between venues, providing valuable perspectives for optimizing future tournament scheduling.

Natural Resource District Reservoirs: Potential Expansion

Joel Rathe

Faculty Sponsor: Joel Helmer

Beginning in 1972, Nebraska's Natural Resource Districts (NRD) were formed to better manage dwindling natural resources within the state of Nebraska. Through the various NRDs located across the state's work, issues pertaining to soil erosion, irrigation runoff, and flood control have been better managed. One area where the NRD's work is prominent in the state of Nebraska is in Johnson County, under the Nemaha Natural Resource District's jurisdiction. Here, the Nemaha NRD has built numerous reservoirs to better prevent issues such as flood control. These privately owned reservoirs have provided recreational opportunities to the people who have access to them. This poster includes proposed locations for future NRD reservoirs in Johnson County that would allow for public access. The hope is that these sites will provide not only environmental benefits but also recreational opportunities for people of all ages.

Current U.S. State Department Travel Advisories

Josh Bergt

Faculty Sponsor: Joel Helmer

Have you ever wondered what difference a travel advisory could make for your travels? Due to recent events, the travel advisory level for places like Jamaica and Haiti have increased which can make travel more difficult for Americans. This project examines travel advisories that the United States uses and how they label every country around the world. This was accomplished by accessing data from the U.S. State Department as well as different travel agencies. Some of the different levels of warning for countries are very surprising and are interesting to learn about. Perhaps this will help inform you about your future travel plans as well.

The Effectiveness of Gait Rehabilitation Technology on Patients

Emily Morse

Faculty Sponsor: Nolan Harms

The demand for rehabilitation among all populations will always be needed. Thus, it is important to evaluate current research and knowledge to help those seeking therapy receive the best rehabilitation possible. While the ability to walk is not essential to life, it enhances the quality of life that one has. This literature review examines the effectiveness of a new piece of technology called Lokomat among various settings. This rehabilitation tool uses highly intensive training to increase the strength of muscles and the range of motion of joints in order to improve a person's gait.

Spatial Analysis of Particulate Matter Concentrations

Joshua Meyer

Faculty Sponsor: Joel Helmer

Carbon Dioxide is the most well known modern day air pollutant, however there are other hazardous molecules in the air that can cause serious health issues. Particulate matter (PM) are small solid particles that can be easily inhaled and are potentially harmful pollutants which are regulated by the Environmental Protection Agency (EPA) in the United States. There are two main types of PM, particles that are 10 micrometers (μm) or less (PM 10) and finer particles that are 2.5μm or less (PM 2.5), with smaller ones being more hazardous. Using data from the World Health Organization (WHO), this project shows average concentrations of PM over time in cities around the world. Results show cities with air that could pose a greater health risk to their residents and also indicate the need for further data collection especially in certain areas of the world.

Woody Encroachment in Central Nebraska, 2001-2021

Rachel Otten

Faculty Sponsor: Joel Helmer

Grasslands are the most threatened yet least protected biome, with only seven intact grasslands remaining in the world. They are home to many plant and animal species and are important for biodiversity and carbon sequestration. Woody encroachment is one of the main threats to Nebraska grasslands today. Central Nebraska was historically mixed grass and sandhill prairie but has now been partially converted to cropland, with the remaining grasslands now threatened by woody encroachment. The most invasive species is the Eastern Red Cedar, which though native, has been taking over grasslands in the past several decades. Utilizing the National Land Cover Database (NLCD), Rangeland Analysis Platform (RAP), and Working Lands for Wildlife (WLFW) Yield Gap, changes over the past couple decades were observed for woody encroachment in Central Nebraska. Focusing on the counties of Custer, Garfield, Valley, Loup, Blaine, and Sherman from 2001 to 2021, results show that about 434,000 tons of grassland production have been lost to woody encroachment in the six counties during this time. Seeing this emphasizes the importance of raising awareness for prescribed burns, tree removal, and grazing management to ensure that the prairies of Central Nebraska are not degraded further.

Assessing the Impact of State Regulations on Chronic Wasting Disease Outbreaks in Odocoileus virginianus

Rylee Ladd

Faculty Sponsor: Joel Helmer

Chronic Wasting Disease (CWD) poses a significant threat to the health and sustainability of Odocoileus virginianus populations across North America. To mitigate its spread, states have implemented regulations affecting how the species can be hunted and harvested. However, the effectiveness of these regulations in containing CWD outbreaks remains uncertain. Utilizing data from the National Wildlife Health Center, the National Deer Association, and the Theodore Roosevelt Conservation Partnership, this research maps the distribution of CWD outbreaks in *Odocoileus virginianus* populations and assesses the relationship with state-level regulations. By examining the spatial relationship between CWD prevalence and the presence or absence of baiting, feeding, carcass transport, and targeted removal laws, conclusions can be drawn on the effectiveness of existing regulatory measures in controlling CWD spread. The results show the importance of wildlife agencies and hunters working together to develop evidence-based strategies for CWD management and conservation efforts.

Effects of Nerve Gliding and Mobilization in Carpal Tunnel Syndrome

Lexis Haney

Faculty Sponsor: Nolan Harms

The purpose of this poster was to investigate the effects of nerve gliding and mobilization in patients with carpal tunnel syndrome. Studies have shown that carpal tunnel syndrome is most commonly found in middle-aged populations. Incorporating nerve gliding into treatment demonstrated more rapid pain reduction in patients. Mobilization therapy is a movement based treatment used to restore homeostasis in the nervous system. With a combination of these two treatments there are significant increases found in both range of motion and strength.

Poster Session C

Monday April 22, 2024 **4:50-5:50p** **Dunklau Lobby**

Caffeine in Relation to Athletic Performance: Coffee, Energy Drinks, and Pre Workout and the Pros and Cons of Each

Julie McIntyre

Faculty Sponsor: Benjamin Hinckfoot

Caffeine use has grown substantially within the past decade and many athletes use caffeine as a way to boost their performance. Caffeine was banned from the NCAA until 2004, but ever since then, many athletes use it. Research shows that the caffeine which is present in coffee, energy drinks, pre workout, etc. does help with performance and focus. However, athletes must be aware of their intake of caffeine because too much caffeine can cause negative side-effects. This applies even more so with energy drinks and pre workout, as both contain other substances besides caffeine which can be overdosed on as well. Research has also been done to assess how caffeine can be used to best improve performance through tolerance levels, genetic types, dosage amounts, and time used before performance.

Power Stations of the World

Thomas Gorline

Faculty Sponsor: Joel Helmer

Since its invention, electricity has become a top level utility and necessity for the world to function. New ways of producing this commodity are constantly being developed and improved. The debate regarding which form this production should take is one of the forefront political platforms. This project will look at the different power stations of the world and compare them and their power generation on a continent by continent basis while also looking at the wealth of different countries compared to their power capacity.

Significance of Docility Measures on Producer Safety and Animal Welfare

Kellie Rhodes

Faculty Sponsor: Dennis Brink

The trait in cattle known as docility is the way cattle react while being handled by humans or when put in an unfamiliar environment. The purpose of this study was to find the predictability of docility for breeding selection to increase overall productivity. This study showed that it is possible to find aggressive animals by analyzing chute score and flight zone, as well as utilizing EPDs. The research was conducted on two different groups of beef cattle. The first group was Hereford-Angus cross, first calf heifers, in Kansas and the second group was a mix of different breeds and aged cows in Nebraska. Each animal was evaluated for a flight zone score. After their flight zone distance was measured, that number was incorporated into an index that was created to analyze docility. After all the flight zone observations were taken, each animal was then analyzed to determine a chute exit score. This report discusses the results of EPD accuracy between sires and progeny as well as how each animal scored on the docility index. From the observations, it can be concluded that the heifers, in general, had lower flight zone scores, the second time they were walked. The results indicate a correlation between the observed flight zone score and the producer's scores. It is also known that there were correlations between the scores in the flight zone test and the chute exit scores observed. Both producers gave the animals scores that reflected closely to what was the observed P-value. All these tests showed that the observations made were similar to the EPD score of the animals or to what others observed.

How Probiotic Supplements Affect Sports Performance

Kassidy Johnson

Faculty Sponsor: Benjamin Hinckfoot

Probiotics, known for their beneficial effects on gut health, are increasingly recognized for their potential to enhance sports performance. This research project outlines the key benefits of probiotics in the realm of athletics. Probiotics aid in nutrient absorption, bolster immune function, and mitigate gastrointestinal distress, thereby promoting sustained energy levels and faster recovery post-exercise. Moreover, they hold promise in supporting mental resilience and focus during training and competition. This concise overview underscores the potential of probiotics as a valuable adjunct to athletic training and performance optimization.

Biomechanical Principles Contributing to Shoulder Injuries While Performing a Volleyball Arm Swing

Gabrielle Nordaker

Faculty Sponsor: Nolan Harms

Volleyball is one of the highest growing sports with adolescent females in the USA. The cultural evolution of competitive spirit in volleyball has increased participation with athletes starting from an earlier age. Although the sport has become highly recognized by the youth, early specialization has demanded players to train more frequently and to take high velocity swings to keep up with the pace of the game. Leading to an increased chance of players developing musculoskeletal shoulder injuries overtime. Numerous studies have analyzed the biomechanical principles of the volleyball arm swing. Looking at both the forces (kinetics) along with the motion (kinematics), research has pinpointed indicators contributing to the rise in players experiencing shoulder pain. Specifically, research has shown that the Bow and Arrow technique paired with high velocity swings has the highest rate of reported shoulder injury. Applying the research can give a new understanding on how to prevent musculoskeletal shoulder injuries in our youth and adolescent female volleyball players.

Exploring Burnout Among College Athletes

Josh D'Ercole

Faculty Sponsor: Benjamin Hinckfoot

Amidst the pursuit of excellence, athletes encounter a formidable adversary. Burnout is something that almost every athlete has to deal with at some point in their career. Burnout is also known as overtraining syndrome. Burnout can look very different for each athlete that deals with it. There are different severities of burnout with the most extreme cases leading to athletes quitting their sport. There are multiple different factors that lead to burnout or overtraining syndrome.

Vertigo: Causes, Treatments, and Prevention

Katie Stachura

Faculty Sponsor: Nolan Harms

Approximately 40% of the United States population will experience vertigo at least once in their lifetime. Vertigo is an inner ear condition with symptoms ranging from mild to severe dizziness and is often accompanied by nausea. Treatment specialists such as physical therapists, primary doctors, and otolaryngologists are often those to treat vertigo patients. This literature research review reveals the causes of vertigo, how individuals can expect to be treated, and what they can do to prevent future episodes of this debilitating condition.

Applied Kinesiology as a Diagnostic Tool in Chiropractic Care

Amira Cummings

Faculty Sponsor: Nolan Harms

Many patients live with adverse health conditions without a non-invasive diagnosis and treatment. Chiropractors can find diagnosis and treatment options for their patients with applied kinesiology. Applied kinesiology is a diagnostic tool that uses manual muscle testing to associate adverse symptoms with muscular strength. Patients who struggle with adverse conditions may have muscle weakness due to abnormalities in their neuromuscular system. Research has shown that patients could reduce symptoms and regain strength in associated muscles through applied kinesiology and chiropractic care.

The Effects of Physical Therapy Within Cancer Patients

Claire Kee

Faculty Sponsor: Nolan Harms

Physical therapy is beneficial to both the psychological and physiological aspects of cancer patients, but it can look different from the physical therapy of an injury. Within cancer patients, the goal is to help maintain muscle and bone mass throughout the body while working on stability and maintaining movement. While only requiring a cancer diagnosis and current treatment, there were various cancer types discussed. Physical therapy was shown to decrease depression, pain, and fatigue, all while increasing self-esteem, balance, and sleeping patterns. Limitations consisted of the psychological results were self-reported. In conclusion, physical therapy has been shown to provide both physical and psychological benefits for cancer patients.

Comparison of MicroBiometer and Solvita Soil Quality Assessments to Traditional Laboratory Analyses

Jessica Ciezki

Faculty Sponsor: Dennis Brink

The goal of my capstone research project is to understand the connection between soil quality assessments and their ability to predict soil quality. MicroBiometer and Solvita may be used in the field to predict microbial activity without the need for laboratory analyses. The major question I hope to answer is: Are these in the field tests of microbial activity correlated to current laboratory methods used to assess soil quality and good predictors of the ability of soil to produce high yields of crops. Statistical analyses of results will demonstrate the ability of in-field tests to predict soil quality compared to traditional laboratory testing.

Sensory Integration Therapy in Pediatrics with Autism Spectrum Disorder

Kamryn Pokorney

Faculty Sponsor: Nolan Harms

Autism Spectrum Disorder (ASD) has become increasingly prevalent in the pediatric population in recent years. Although symptoms may vary, sensory features, or behaviors, are present in many individuals with ASD. Therapists have turned to sensory integration therapy (SIT) to help improve a child's ability to process and integrate sensory information, resulting in more adaptive and organized behaviors. This literature review analyzes the effectiveness of using SIT as treatment in occupational therapy for pediatrics with ASD.

America's At-Risk Bumblebees: A Spatial Examination of Their Decline

Nathan Kurth

Faculty Sponsor: Joel Helmer

Bumble bees are essential in pollinating multiple economically important crops, but rising temperatures, habitat loss, and fertilizers threaten their survival. The decline has been more severe for some species, with 11 American species now listed by the International Union for Conservation as at-risk. This study uses publicly available data from the Global Biodiversity Information Facility to map the observed locations of these 11 species. The results highlight where individual species have faced the most significant decline and where more work is needed to protect these vital pollinators.

Poster Session D

Monday April 22, 2024 **6:00-7:00p** **Dunklau Lobby**

The Impact of Creatine Supplementation on Physical Performance

Hunter Cole

Faculty Sponsor: Benjamin Hinckfoot

Creatine, a naturally occurring substance present in muscle cells, has received significant interest as a potential ergogenic aid for improving athletic performance. Numerous studies have shown that creatine supplementation can result in greater high-intensity exercise capacity, muscle strength, power output, and lean body mass. These benefits are especially noticeable in activities like running, jumping, and resistance training. Research studies strongly support creatine supplementation as a safe and effective technique for improving physical performance in a variety of sporting domains.

Epi-GIS: Using Geospatial Technology to Illustrate Diabetes Prevalence in the United States

Madelyn Graham

Faculty Sponsor: Joel Helmer

The convenience of analyzing and understanding the role of places in disease dynamics has increased greatly in recent decades. This advance in the study of health and human services is primarily attributed to developments in quantitative methods and geospatial technologies such as spatial analysis and GIS. A spatial approach to disease analysis is crucial for understanding the uneven distribution of non-communicable diseases influenced by various environmental and socio-economic factors. This approach is particularly pertinent to type II Diabetes Mellitus (DM), as studies have revealed connections between DM prevalence and geographic and environmental factors like access to fast food, availability of green spaces, reliance on cars for transportation, and limited opportunities for physical activity. The Centers for Disease Control and Prevention has created a GIS monitoring system to analyze areas of the United States where noncommunicable diseases like diabetes are present. By examining geospatial presence of type II diabetes and areas of lower socioeconomic status, there are many overlapping consistencies that offer valuable insights to guide the allocation of resources and public policy decisions.

May the Road Rise to Meet You: An Analysis of A Cappella Tours Over 25 Years

McKenna McSpadden

Faculty Sponsor: Joel Helmer

For the hundreds of past and present members of the Concordia A Cappella Choir, the memories and experiences gained on choir tours are a crucial part of their college experience. Not only are tours important for students, but they are also a key avenue for the A Cappella Choir to recruit future students, connect with alumni, and share the Gospel message. Through scouring past programs, this map exhibits where the A Cappella Choir has toured in the past twenty-five years, as well as providing insight into what areas the choir could explore traveling more often. This project also includes an interactive online map that allows for a closer examination of individual tours and stops, letting past and present members reminisce on A Cappella's most treasured tradition.

Tornado Time Series: Mapping the Spatial Evolution of Tornado Occurrences

Charlie Hayden

Faculty Sponsor: Joel Helmer

A tornado time series map is critical for comprehensively understanding the historical patterns and trends of tornado activity across the United States. By harnessing data from the National Weather Service database, this study visually depicts tornado occurrences over decades (1950-2022), providing valuable insights into their temporal and spatial patterns. By segmenting the data into ten-year intervals, viewers can discern nuanced shifts and fluctuations in tornado activity, identifying regions where tornadoes are more prevalent and visualizing how these patterns have evolved. This information is essential for informing decision-making and preparedness efforts at individual and community levels, enabling stakeholders to anticipate and mitigate the impact of tornadoes by better understanding historical trends and potential future trajectories of tornado activity.

Broadband: Expanding Near You

Walker Ranada

Faculty Sponsor: Joel Helmer

Have you ever been impacted by slow internet speeds? Have you experienced video calls freezing, videos buffering, or webpages refusing to load? Learn about internet speeds, internet transmission technologies, and broadband disparity. Internet speeds became vastly more important during the 2020 lockdown, as nearly everyone had to work remotely, which required a stable, fast internet connection in order to communicate and collaborate with other employees. This presentation will focus on internet speeds across the nation, different internet transmission methods, and how the Nebraska Broadband Project (NBBP) aims to resolve broadband disparity. Research examines data from The FCC to visualize internet speeds in different counties in America and. Data from the State of Nebraska was also examined to show counties in Nebraska that applied for improved internet speeds.

Investigating the Approach of Coaching on Men and Women in Sport

Bradyn Whittington

Faculty Sponsor: Benjamin Hinckfoot

Women's sports are growing in popularity with the rise of athletes like Catlin Clark and Angel Reese. It is important with this growth for coaches to understand who to best serve men and women athletes in sports. Research has been done investigating gender-sensitive coaching approaches in athletics. Aiming to understand how coaching methods differ when working with male and female athletes. This review

examines effective coaching strategies tailored to the unique needs, preferences, and challenges of working with male and female athletes. Findings from this research contribute valuable insights into fostering inclusive coaching practices that optimize athletic performance, motivation, and well-being while promoting gender diversity in sports.

Lines of Inequality: A GIS Study of Redlining in Omaha, Nebraska

Justin Otten

Faculty Sponsor: Joel Helmer

Redlining is a discriminatory act when financial and economic services withhold their resources to certain racial minorities or ethnic groups. Redlining brought massive damage to many communities, and specifically the community of Omaha, Nebraska. In 1935, The Omaha Home Owner Loan Corporation delineated certain areas of north and south Omaha using colored lines, with green representing “low-risk” loans, and red representing “high-risk loans”. This study uses historic maps overlaid on top of current maps, and geospatial data from the US census to analyze the effects that redlining has had on ethnic groups and minorities in Omaha. The results of this study provide insight into the history of redlining, as well as hope in the future to limit its impacts.

Just Winging It

Jennifer Katz

Faculty Sponsor: Joe Gubanyi

Raptor Recovery is an extremely crucial organization that plays a large role in preserving injured birds of prey through rehabilitation until they can be released back into the wild. Under the supervision of Dr. Joe Gubanyi, a couple of us were able to experience the rehabilitation process for injured birds as well as working to provide minute care to temporarily improve health diagnostics. Aspiring to be a veterinarian, this project introduced a new field of knowledge and excitement for animal well-being. As a portion of our Ornithology course, the application of our skills and understanding has been of great use to embellish all apprehension of this study. This project is aimed to provide further information about Raptor Recovery to inquiring minds, as well as share our current experiences and acquired awareness for wounded raptors.

The Slow Death of the Aral Sea

Jackson Lindburg

Faculty Sponsor: Joel Helmer

The Aral Sea used to be one of the earth's largest and most life-filled lakes up until 1960, but in the decades since, it has shrunk to a fraction of its size. Beginning in the ‘60’s, the USSR dammed up the core rivers feeding the Aral Sea in an effort to boost crop production in the region; what they didn’t foresee was the disappearance of Central Asia’s few sources of water. The Aral Sea was the world’s fourth largest freshwater lake before these projects began. This massive economic change is best captured by NASA’s LANDSAT satellite database of images. These images were geocoded and brought into arcGIS Pro, where they now stand as a grim display of perhaps the world’s greatest ecological disaster.

Sex Offender Distribution in Nebraska

Jonathan Grass

Faculty Sponsor: Joel Helmer

There are approximately 750,000 registered sex offenders in America. As of 2022, there were over 6600 registered offenders in Nebraska. This project utilizes address data from the Dru Sjodin National Sex Offender Registry to map each registered offender as a single point. This project also shows proportions of sex offenders in each county, normalized by county population. Additionally, a case study analysis of sex

offender proximity to schools was conducted due to laws requiring sex offenders to live 500 feet or further from schools or child care facilities.

A Puerto Rican National Park: A Geographic Argument

Samuel Richling

Faculty Sponsor: Joel Helmer

The island of Puerto Rico contains environments and ecosystems that are found in few other places across the United States. From lush rainforests to sprawling mangrove forests to vivid coral reefs–there is no question about Puerto Rico's natural beauty. Despite this, the National Park Service does not have a National Park on the island. Using a collection of maps created in ArcGIS, I have investigated Puerto Rico's natural habitats and citizens to make the argument that the NPS should consider forming a park and, additionally, I have formulated a shortlist of possible areas where it could be made. From both environmental and economic perspectives, see why the land, sea, species, and people of Puerto Rico would benefit from the establishment of a National Park.

Virtual Reality Training for Sports Development

Joey Grabanski

Faculty Sponsor: Benjamin Hinckfoot

Step into the realm of innovation as we explore the dynamic intersection of virtual reality (VR) technology and sports training. Through immersive experiences and cutting-edge simulations, VR training is revolutionizing athlete development across various sports disciplines. This research will explore how virtual reality refines skills, enhance decision-making, and optimize performance, heralding a new era in sports development.

The Speed Bridge and Its Effects on Athletes Post Operation

Tristin Kinderknecht

Faculty Sponsor: Nolan Harms

Athletics is a perfect way to not only advance your own knowledge on teamwork and competitive environments, but also a good career choice for many that can reach that elite level. However, injuries can plague so many individuals as they continue to attempt to grow their careers as athletes. One of these injuries that is the least forgiving is an Achilles tear. This injury has led to the highest rate of early retirements out of any athletic injury. Due to this increased rate many medical researchers have attempted to look for ways to make sure that individuals can return to play post operation and continue their long journey to the big leagues.

Oral Session A1

Monday April 22, 2024 **Dunklau 142**

Questioning Unquestionable Orthodoxies: Why Open Dialogue is Critical to the Pursuit of (Medical) Truth

Micah Willweber 2:30-2:50p

Faculty Sponsor: John Hink

Community water fluoridation (CWF) usually involves adding fluoride to municipal water supplies to guard against tooth decay. U.S. public health strategists heavily promote CWF, but some researchers raise concerns about its harmful effects on the skeletal system, the developing brain, and the environment. These researchers are often ostracized by the wider scientific community, which considers CWF to be “safe and effective.” CWF is a symptom of a larger problem in American society: many scientific and academic institutions have become blind to opposing viewpoints and have lost public trust. To restore trust and promote public health, medical institutions and policymakers must re-embrace principles of scientific inquiry and intellectual humility. Americans should approach any health advice with a measured dose of skepticism and freely discuss the merits and drawbacks of different approaches. Approaching the subject from a Christian perspective, this project aims to start the conversation.

Playing The Fool: A Narrative Archetype for Life

Gwendolyn Gaunt 2:50-3:10p

Faculty Sponsor: John Hink

Despite the prevalence of language and storytelling in human life, we rarely consider its influence in our own. Enter “the Fool,” a literary archetype that provides a link between intrinsic linguistic quirks and their manifestations in fictional character writing. This project celebrates the Fool for his embodiment of the adaptability, humility, and explorative joy that stems from our earliest language acquisition and permeates the fabric of narrative itself—including the stories of our own lives.

Novel: "On the Edge of Blessing"

Anne Aschmann 3:10-3:30p

Faculty Sponsor: John Hink

This is an academic presentation of "On the Edge of Blessing", completed as Anne Aschmann's capstone project for the Luke Scholars program. For the capstone project, Anne completed Act 3 of Book 1 in a series of three books which will tell the story of "On the Edge of Blessing". "On the Edge of Blessing" initially follows two characters, Edge and Terence. Both of them wake up injured, with amnesia, in separate worlds, neither of which are their own. The story describes how they transform both physically and mentally, how they choose to maintain old values or adopt new ones in the face of completely new situations, and how they discover new purposes.

Oral Session A2

Monday April 22, 2024 **Dunklau 144**

Retirement Simulation

Nick Sazama 2:30-2:45p

Faculty Sponsor: Brian Albright

In today's average college graduates have a mountain of debt coming out of college, with little to no savings to account for. College drains all funds and students are left with nothing to get their life started, but the hope of retiring one day with enough money. That is my question today is, what is the amount of money college students need to retire comfortably? Most places say to put your money into a savings account and not touch it, not a terrible idea, but with only earning .05% return on your initial investment isn't good. Savings accounts are the safest bet to build very little money, but the stock market with more risk involved will make sure you retire well. The average return rate for the stock market on average is around 10% with deviation around 12%, so a normal distribution sounds best fit, for it to have a mean and standard deviation. Most times going through the stock market will have its ups and downs, so I want to simulate what it would be like to leave your money in the market until you are set to retire. This amount may vary depending on your needs, but on average, one million dollars is good. So, what is a good amount of money to start off with in the stock market to finish with a million dollars? The minimum amount of money to start off with should be 1500, with the condition of putting 2200 each year into the market. With these two conditions, and the stock market being random on the return, we should get a million dollars each time. I simulated over 5000 trials and the average rate of return after 40 working years is 1.1 million dollars.

Drive-Thru Scenario Simulation

Alec Blakestad 2:45-3:00p

Faculty Sponsor: Brian Albright

This project is a simulation of a couple different scenarios involving a fast food drive-thru. I will run simulations for a one window drive-thru and a two window drive-thru. In the first scenario, there is one window where a customer orders, pays, and picks up food with only one worker. In the second scenario, there is a window to order, and a second to pay and pick up food involving two workers doing two different jobs.

Electricity generation- how much do we need?

Alexander Johnston 3:00-3:15p

Faculty Sponsor: Brian Albright

While total electricity generation in the U.S. has only slightly increased in recent years, the mixture of generation sources has noticeably changed. The change of most interest is the growth of the share of "renewable" inconsistent energy sources, primarily wind and solar. The generation mix is changing, but the desire for reliable power doesn't. The question then is, what should electricity generation look like, especially in regards to consistent baseline generation, such that demand is met a high percentage of the time. Utilizing publicly available Energy Information Administration national-level data as a basis, this presentation explores what a practical electricity generation distribution looks like that meets demand at a high reliability rate.

Oral Session A4

Monday April 22, 2024 **Dunklau 151**

Senior Exit Review

Mattie Stillahn 2:30-2:50p

Faculty Sponsor: Seth Boggs

I will be presenting my portfolio that takes on the different medias I have used throughout my college career.

College Portfolio

Brooke Townsend 2:50-3:10p

Faculty Sponsor: Don Robson

I am presenting my work through the last four years of my college career.

The Ditto Loop

Matt Hawes 3:10-3:30p

Faculty Sponsor: Don Robson

Ditto is the recycling of beliefs, materials, symbols, and circumstances. The same things happen again in different ways. One's circumstances appear unique, but are actually an alteration of another's. The feeling of joy, loss, pain, and uncertainty are present in everyone's lives and will continue to be. The combination of circumstances is an infinite cycle. My work engages with this theory. What gives our lives meaning is the things we give power to. I collected materials and I gave them power. I recycle them and present it as a representation of my combination of circumstances.

Throwing Shade

Halley Shade 3:30-3:50p

Faculty Sponsor: Don Robson

I am Halley Shade, an aspiring Art Therapist with a passion for the younger generation. My goal is to help children learn healthy coping and relational skills early in life. With a strong foundation to rely on you can only grow. While children are developing, they are learning how to manage and understand their emotions. I believe it is vital to teach children healthy coping skills during this time. Children communicate through images they create or see. This is why their creativity is so high during this time. With a healthy outlet such as drawing, painting, or sculpting children are able to communicate with others even when words are difficult to match with their emotions. While Art Therapy can be very useful for children I hope to show others that all ages would benefit and can be included. I will be presenting a compilation of my completed artworks throughout my time at Concordia as well as artworks I assisted with during my internship.

Senior Exit Review

Larissa Embree 3:50-4:10p

Faculty Sponsor: Seth Boggs

Throughout this presentation, I will reflect on my growth as an artist during my time at CUNE by detailing the evolution of my work over the years, my discovery of my preferred mediums and techniques, and ultimately showing the final project I have been working on as the culmination of my college career.

Oral Session B1

Monday April 22, 2024 **Dunklau 142**

The Chatechetical Sermons of Surei-ma: An Experiment in Natural Theology through the Medium of Alternate History

Philip Norton 3:40-4:00p

Faculty Sponsor: John Hink

"I am convinced that if we could tell the supernatural story of Christ word for word as of a Chinese hero, call him the Son of Heaven instead of the Son of God, and trace his rayed nimbus in the gold tread of Chinese embroideries or the gold lacquer of Chinese pottery, instead of in the gold leaf of our own old Catholic paintings, there would be a unanimous testimony to the spiritual purity of the story. We should hear nothing then of the injustice of substitution or the illogicality of atonement, of the superstitious exaggeration of the burden of sin or the impossible insolence of an invasion of the laws of nature. We should admire the chivalry of the Chinese conception of a god who fell from the sky to fight the dragons and save the wicked from being devoured by their own fault and folly. We should admire the subtlety of the Chinese view of life, which perceives that all human imperfection is in very truth a crying imperfection." [G. K. Chesterton, "The Everlasting Man."] Inspired by this quote, I have written a pseudo-patristic document from the perspective of an alternate timeline in which Christianity spread to East Asia in the fourth century. The sermons, ostensibly the handiwork of a Korean missionary evangelising the Japanese, are in fact a lens to explore the nature of natural theology through the means of a culturally alien understanding. Most of us have at least some familiarity with the Western Christian framework of natural law informed by Greek philosophy, but our tendency is to accept or reject it overall with very little thought, even as we cannot escape it. By examining the concept of natural revelation through a different worldview's eyes, and subjecting familiar Biblical texts to the same worldview, we are forced to wrestle with the question of perspective: what truths seem strange if stated in a foreign way, and what misreadings become more obvious in light of another culture's understanding?

Striving After Hope: Existential Journey For Answers In A Postmodern Context

Devon Reitz 4:00-4:20p

Faculty Sponsor: John Hink

The pursuit of truth, if such a thing exists, has been a long-standing aim of humanity at large for good reason: it is hoped that an understanding of our place in the universe could help alleviate existential suffering. However, within a postmodern context, finding these solutions is very difficult. This story examines the problem presented, especially regarding the issue of self-deception, and it hints at a possible mindset that someone of our culture may have as they encounter Christianity, and more important than the search for answers is the hope that Christ encounters us on his own terms.

The Best Worship Music: What Does Worship Do, How Does Music Fit in, and How Does a Composer Write Songs that Do it Well?

Anna Grass 4:20-4:40p

Faculty Sponsor: John Hink

Music in Christian worship serves all of the same purposes that worship itself does. God speaks and acts through the proclamation of the Word in music, forgiving sins and strengthening faith. Music guides the human response of praise in worship. Composers of church music ought to focus primarily on these purposes of worship music, and serving them in a way that is beautiful and honors the craft of composition itself. This involves ensuring that the text is true and suited to the congregation, and the music depicts the text and is composed creatively.

Oral Session B2

Monday April 22, 2024 **Dunklau 144**

Therapy and Its Effect on Children Who Suffer from Abuse

Chloe Dahn 3:40-3:55p

Faculty Sponsor: George Toman

Coping mechanisms look different among all ages. This literature review explores ways in which children cope with the trauma from abuse. Play therapy is a therapeutic method that is designed to use play as a means to cover psychological issues in children that cannot be done using other methods, like traditional therapy. Through play therapy, kids learn to express their thoughts and feelings in appropriate ways. This literature review uncovers similarities and differences in different play therapy approaches and how the children cope with repercussions of past abusive behavior.

Shrinking Dart Board Simulation

Anne Aschmann 3:55-4:10p

Faculty Sponsor: Brian Albright

This project is an Excel simulation of a dart game where a player throws a dart at the board, and a secant line is drawn perpendicular to the radius at the point where the dart lands, in order to determine a new radius for a new dart board whose length is half that of the secant line. The project aims to determine the expected number of rounds in a game and the required value for skill level for a player to win 95% of the time.

Literature review over: Drosophila used to explore secondary injury after Traumatic Brain Injury

Mollie Urkoski, Sarah Cluver, and Adrianna Rodencal 4:10-4:25p

Faculty Sponsor: Kyle Johnson

Our group presents a brief literature review on the article "Drosophila used to explore secondary injury after Traumatic Brain Injury," which was used to explore secondary injury in Drosophila after traumatic brain injury. We delve into the effects of traumatic brain injuries and subsequent diseases, highlighting the invaluable potential of Drosophila research in understanding these phenomena. Focusing on concise analysis, we discuss how insights from the Drosophila study shed light on the underlying mechanisms of traumatic brain injury sequelae, which may offer promising avenues for further research and therapeutic interventions.

Corn Pollination Internship Experience

Karsten McCarter 4:25-4:40p

Faculty Sponsor: Dennis Brink

Pollination is the essential function of corn production that results in yield. It is a delicate process in corn that takes place over multiple days and can be affected by multiple factors. The research conducted focused on temperature during the planting of seed corn. Three planting dates were looked at over the Bayer growing area. The goal was to see how the temperature at planting affected the breaking of sterile corn in the field. A freeze date occurred with the seed in the ground. The research examines the difference between fields planted before, on, and after this freeze date.

Oral Session B3

Monday April 22, 2024 **Dunklau 143**

Card Dealing in 10 Point Pitch

Buchannan Tietjen 3:40-3:55p

Faculty Sponsor: Brian Albright

In the card game 10 Point Pitch, the number of points in your hand fully decides what you bid to win the hand but, does it matter how the hand is dealt so that all players receive a fair hand? Does the number of players affect the number of points each player receives? Both of these concepts are tested through simulation using Microsoft Excel. The way the hand is dealt and the number of players was found to not affect the number of points in a single player's hand.

Exploration and Proof of a Property of Linearizable Models

Nathaniel Mueller 3:55-4:10p

Faculty Sponsor: Brian Albright

In Mathematical Modeling with Excel by B. Albright and W. Fox, there is a curious little property regarding linearizable models. This property is presented in Exercise 2.7.6, albeit strictly for linear models. The property in question concerns the sum of measured values and the sum of model-predicted values. For linear models, these sums are equal. The following is an exploration of this property for linear models and other linearizable models, first demonstrating by example that the same property seems to hold, culminating in proof of the property for each model type.

The Lutheran Church Missouri Synod's Position on Mental Health and Mental Illness

Stephen Duffy 4:10-4:25p

Faculty Sponsor: George Toman

With mental illness on the rise people may look to the Church for help. This review summarizes the literature to understand the LCMS's position on the subject of mental health and mental illness including what steps the synod is taking to address the public health issue. Several themes and ideas emerged that summarize the LCMS's position on Mental Health and the actions taken to address it. These themes will be discussed further. Despite the resources provided, the LCMS has no official position or approach on their handling of these cases. Suggestions on how the LCMS can improve their approach to addressing mental health in the church are provided.

Tennis Simulation using Excel

Manuel Rodriguez 4:25-4:40p

Faculty Sponsor: Brian Albright

This project is about simulating a tennis match in Excel, using math concepts and statistical analysis. The goal is to show different scenarios in a tennis match and how probabilities affect the results.

Oral Session C1

Monday April 22, 2024 **Dunklau 142**

The Rituals of Excellence: Exploring Pregame Routines Across Athletic Domains

Jaxon Weyand 4:50-5:05p

Faculty Sponsor: George Toman

Pregame routines have been a topic of interest for a long time within sports psychology. This research study dives into the similarities and differences between different athletes' pregame routines across different sports. Through purposive sampling, interviews were conducted with six different athletes, in which three were female and three were male. From this, interviews were analyzed to understand the variety of pregame routines athletes use and how each routine leads to individual success. Initial findings reveal a significant difference within the athletes' pregame routines. This qualitative study uncovers the effects of pregame routines and shows how different athletes are able to enhance their focus before competition. Overall, this research contributes to our understanding of the psychological and performance-related implications of pregame routines between males and females in a variety of sports.

Characterization and Analysis of MDCK Cells Used for Influenza Research

Luke Johnson 5:05-5:20p

Faculty Sponsor: Raegan Skelton

Madin-Darby Canine Kidney (MDCK) cells are one of the most used cell lines for influenza research *in vitro* due to their high susceptibility to influenza infection. MDCK cells can be divided into three major classes based on their physical and biochemical characteristics. My research this semester worked towards classifying the MDCK cell line used here at Concordia along with assessing how this line of cells supports influenza growth kinetics after being passaged for over 15 years.

Jeffrey Dahmer: Sick or Evil or Both?

Lindsay Palmer 5:20-5:35p

Faculty Sponsor: Kim Boyce

The concept of derision, laughter at an object of reverence for the purpose of bringing it down from its position of high regard, can hold two motives. Throughout history, derision can either attack the foundations of human motivation and harm human purpose by doing so, or it can critique an object which has been improperly upheld, which may or may not lead to a different object of reverence growing in the place of the displaced object. This project explores the morality involved in derision and how the two types of derision relate to human motivation.

An Exploration of Five Lutheran Church-Missouri Synod Children's Understanding of God and Their Faith

Hope Nelson 5:35-5:50p

Faculty Sponsor: George Toman

The United States has seen a significant decline in the number of citizens who describe themselves as religious over the past several decades, leading to a decrease in the number of children raised in homes subscribing to a particular religious tradition. Previous research has described several factors that predict a child's perceptions and understanding of God and their religion, which in turn may influence how likely they are to remain in the church through adulthood (Roos et al., 2004). This study explores common

themes among how five children (ages 8-13) who are members of a Lutheran Church-Missouri Synod (LCMS) congregation understand and explain concepts of God's nature, God's personal concern, and Lutheran doctrine as a way to inform schools, churches, and families about what their youngest members understand and think about their own faith. Themes and implications of children's understanding and perceptions will be discussed.

Oral Session C2

Monday April 22, 2024 **Dunklau 144**

How Different Music Genre Facilitate Memorization of Terms

Molly Roberts 4:50-5:05p

Faculty Sponsor: George Toman

It is important for university students to optimize their study habits to succeed in college. One study tactic that has remained a staple is music. However, this leaves a question: which genre will best allow students to memorize? There's an endless supply of options, but previous research has shown classical music as a clear and effective choice. However, many studies neglect to investigate any other music genre. Pop music, for example, is a popular form of music. It's possible that listening to this genre is useful for students. This research study tests how classical music and pop music affect university students' memory recall using basic Spanish terms. Three university students were assessed using a single-case AB design. Results and implications of the study are discussed.

Coping Strategies for Children in Hospitals: A Literature Review

Macy McClain 5:05-5:20p

Faculty Sponsor: George Toman

There are millions of children admitted to hospitals every year where they spend extended amounts of time to recover from medical issues. Some visits last a few hours, while others last for weeks or months at a time. The hospital environment can cause negative emotions and fear in children that they can't escape but can only cope with. This literature review goes into what coping methods help children during their hospital visits. This includes the impact of parental factors, interactions with physicians, specific toys, and other examples. There are also coping strategies used in part of their everyday life that vary from positive images, understanding the situation, and more. This information was found in qualitative studies through interviews with children in different wards of hospitals to understand what factors negatively influenced the children and how they cope through those experiences.

Modeling a Multiple Regression of the Lions Score

Henry Gaertner 5:20-5:35p

Faculty Sponsor: Brian Albright

I created a model that could predict the Detroit Lions' score. For each Lions regular season game in the last 3 seasons, the Yards Gained, Yards Allowed, Defensive Stops, Turnovers, & Penalties were obtained from NFL.com. These are the possible predictor variables. Regression Data Analysis on Excel, graphs, & logic were used to arrive at the conclusion. The best model is to have Yards Gained & Turnovers as the predictor variables. I looked at whether the best predictor variables would be different for home & away games and used the model to try and predict the scores of the playoff games.

Superstitious Behaviors in Track and Field Athletes

Jordan Koepke 5:35-5:50p

Faculty Sponsor: George Toman

Superstitions are a phenomenon among track and field athletes in which athletes believe routines affect performance without evidence supporting this. This qualitative study explores the different superstitions experienced by male and female athletes as well as how superstitions are used as coping skills. Previous research shows evidence that superstitions can be used as coping skills and that male athletes tend to be more superstitious. In this study, interviews were conducted to find any themes in track and field athletes' superstitions. Results and implications for practice are discussed.

Oral Session D1

Monday April 22, 2024 **Dunklau 142**

The Pope: Antichrist, or Falsely Accused?

Nathaniel Demlow 6:00-6:15p

Faculty Sponsor: Charles Blanco

This study presents an improved historical rendering of Pope Innocent III and the reforms of the Fourth Lateran Council. Scholars have painted Innocent III as a proponent of papal power and hegemony, but new analyses of primary sources detailing his reforms demonstrate concerns for lay spirituality, clerical reform, and refocusing the Crusades. This positive interpretation of Innocent's character in turn appears to contradict the Lutheran Confessions, which deem the Pope the Antichrist. Is this sympathetic historical view of Innocent III compatible with our Confessions?

Project Feeder Watch

Creighton Taylor 6:15-6:30p

Faculty Sponsor: Joe Gubanyi

Project Feeder Watch is a citizen science project that enables communities to record information about the types and numbers of birds present in their area. This data is then utilized by scientists to track bird migration patterns, decreasing species, and various other categories. Using tools like eBird and Merlin, we dedicated Mondays and Tuesdays to collect data on birds that frequented the bird feeders behind Link Library on campus. Not only was this information shared with the scientists of Project Feeder Watch for research purposes, but it allowed us to make our own observations of the birds found on Concordia University, Nebraska's campus.

Exploring Influenza Virus Impact on MDCK Cells: Viability, Morphology, and Infection Dynamics

John Merritt 6:30-6:45p

Faculty Sponsor: Raegan Skelton

This research examined the impact of influenza A virus infection on Madin-Darby canine kidney (MDCK) cells to understand virus-host interactions, utilizing standard techniques such as HA titers and TCID50 assays alongside image analysis. The study hypothesized increased cell death rates and morphological change would correlate with infection progression, providing insights into influenza virus interactions with MDCK cells. This research helped characterize virus behavior at Concordia University Nebraska for the first time. Our results show CUNE can research viruses in an impactful way.

Excel Blackjack Simulation

Nathan Pennekamp 6:45-7:00p

Faculty Sponsor: Brian Albright

Mathematical modeling in Excel lends itself to countless applications, including mathematical simulations. This project demonstrates a Microsoft Excel simulation of the popular casino card game "Blackjack." A simple Blackjack model can be constructed by eliminating elements of a "player's decision". In simulating thousands of hands of Blackjack, one can approximate the probability of a given player beating the dealer.