

NORTH CENTRAL COLLEGE

# HONORS DAY 2025

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✕ Oral Presentations



NORTH CENTRAL  
COLLEGE 1861

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## Poster Session I: 8:30 - 9:20 a.m.

*Stevenson Hall*

### Gold, Glory, and Deception: Hitler's Olympic Propaganda

*Luciano Abish '28, Business Management*

*Advisor: Gregory H. Wolf*

The 1936 Berlin Olympics served as a powerful propaganda tool for the National Socialist Party, showcasing Germany's vision manipulated under Adolf Hitler's rule. My project analyzes how Nazi propaganda used the games to promote Aryan supremacy, national physical strength, and political dominance while masking the regime's oppressive policies. For instance, Nazi banners covered stadiums, and choreographed parades projected unity and power. My study examines how the National Socialist use of German athletes in propaganda posters, photographs, and cinematography shape national and international perception. The poster will include Riefenstahl's: Olympia – Festival of Nations (1936), images of Hitler and his athletes, and news excerpts on international reactions. By examining the fusion of sports and nationalism in Nazi propaganda, my project explores the dangers of political manipulation in global events and the media's role in shaping public perception and ideology.

### Defining the "New Woman": The Perception of Gender Roles and Sexuality in France during the Interwar Period

*Ayshe Ali '26, Social Science/History and Secondary Education*

*Advisor: Shereen Ilahi*

The term "New Woman" describes a modern idea of womanhood, with an emphasis on economic and sexual freedom. European women took a more public role in society as men went off to fight in World War 1. Returning soldiers were often taken aback by women resisting pre-war gender ideologies, especially in France. I examine primary sources written in French and translated into English such as women's suffrage pamphlets, newspaper articles, government policies, and French literature to argue that the idea of the "New Woman" was highly exaggerated by anti-feminists (both male and female) and far from the reality. Despite the effort some French feminists put towards social freedom, it would take decades after World War 1 until we see radical change for women in France.

## Design and Evaluation of a Computer-Controlled Spectrometer

*Nazifa Anis '26, Applied Mathematics and Physics*  
*Advisor: Orion Pearce*

In our research, we designed and evaluated a computer-controlled spectrometer to investigate the Raman spectra of compounds, a technique that analyzes inelastically scattered light to reveal molecular vibrations and chemical structures. Firstly, we successfully detected the Raman spectrum of toluene, identifying key vibrational peaks that validate the system's performance. Then, using a hydrogen deuterium lamp, we observed a doublet crucial for calculating neutron mass, further demonstrating the system's accuracy. Our methods involved calibrating the monochromator, optimizing light collection, and analyzing spectral data to achieve precise peak detection. These findings highlight both the capabilities and limitations of our setup, emphasizing the need for further refinements to improve sensitivity and resolution. Future work will focus on enhancing signal strength, refining optical alignment, and expanding compound analysis to advance the monochromator's application in Raman spectroscopy.

## Sleep and Memory for Emotional Experiences

*\*Stella Bank '26, Behavioral Neuroscience and Psychology*  
*\*Amelia Deliberto '27, Psychology and Behavioral Neuroscience*  
*\*Raven Range '27, Psychology*  
*Advisor: Alexis Chambers*

Emotions and sleep increase memory consolidation separately, but they also interact to improve memory for emotional events following sleep. Because previous work studied this phenomenon using contrived laboratory settings and stimuli (e.g., testing memory for words and pictures), the current study examined this effect on more realistic emotional events by asking participants to imagine themselves in sad or neutral scenarios while listening to sad or neutral music, respectively. Participants then went to sleep at home or continued their day and returned 12-hours later for a surprise memory test of the scenarios. Those in the sad condition remembered significantly more of the scenarios compared to the neutral condition. No significant differences were found between sleep or wake conditions, and there were no interactions. This data establishes a large role of emotions in memory, but the role of sleep and emotions working together need to be further investigated using this paradigm.

## Setting Europe Ablaze: The Unlikely Success of the Special Operations Executive Section F 1939-1945

*Emily Bartel '26, Social Science/History and Secondary Education*  
*Advisor: Shereen Ilahi*

During World War II, the Special Operations Executive was created by Winston Churchill. This research focuses primarily on France's Section F of the SOE which employed British and French women in various occupations such as couriers, typists, and radio operators. I argue that gender stereotypes played a key role in allowing these women to work undercover behind enemy lines. Utilizing primary sources such as memoirs and government reports, I found that many of the women involved endured harsh conditions such as being taken hostage, tortured, or put to death, and accomplished feats that aided in the war movement. For example, Noor Inayat Khan worked as a radio operator and was captured by Germans. She was starved, tortured, and eventually executed. My

thesis in this project is that women were able to utilize gender stereotypes to their benefit in order to work undercover in dangerous positions and aid the French Resistance.

## The Second Founding and Arendt's Revolutionary Spirit: The Experience and Legacy of the Exclusion of Slavery

*Abigail Black '25, Political Science and Sociology*  
*Advisor: Sean Butorac*

In theorizing revolution and America's lost treasure, our revolutionary spirit, Arendt struggled to grapple with our far darker inheritance: the experience and legacy of slavery. Considering Reconstruction Era, the "Second Founding" and an unfinished revolution, lays bare the uses and limits of Arendt's thought. This paper addresses these elements of Arendtian thought by reconciling her flawed understanding of slavery and racial tyranny with her thought on public freedom. This paper begins by juxtaposing slavery and enslaved peoples' experiences of violence and exclusion from the public sphere with their leveraging of Black power and influence during the Civil War to achieve liberation. The paper then contrasts the project of Reconstruction to actualize the recognition of Black peoples' freedom with the effects of the segregationism that consolidated powers into opposing and unequal White and Black communities.

## Comparing the Effects of Drawing, Coloring, and Writing on Mood and Self-Efficacy

*Casen Camarillo '25, Psychology*  
*Advisor: Marissa Bamberger*

This study compares the effect of different creative activities (drawing, coloring, and writing) on self-reported mood (positive and negative affect) and self-efficacy. Drawing was hypothesized to have a greater effect on improving mood and self-efficacy than coloring or writing. In this study, 65 undergraduates were randomly assigned to a 10-minute drawing, coloring, or writing activity. Before and after the activity, participants completed the Positive Affect Negative Affect Scale (PANAS) and General Self-Efficacy Scale (GSES) to assess mood and self-efficacy. Results indicate improvement in self-efficacy and positive affect and a reduction in negative affect from pretest to posttest across conditions. However, there was no statistically significant differences between the creative activities on improved self-efficacy and positive affect or reduced negative affect. Therefore, the study's findings suggest it is beneficial to engage in a creative activity to improve mood and self-efficacy, but the specific activity does not appear to matter.

## The Blueprint of Genocide; Aktion T4 and the Rise of Eugenics in Nazi Germany

*Anna Cameron '25, Social Science/History and Secondary Education*  
*Advisor: Shereen Ilahi*

My research examines Aktion T4, a Nazi euthanasia program designed to systemically sterilize and murder individuals deemed as "unworthy of life," according to the eugenics guidelines laid out by Francis Galton in his book, *Essays in Eugenics*. The analysis of figures such as Dr. Karl Brandt, Hermann Pfannmüller, and Phillip Bouhler illustrate how medical professionals became architects of



mass murder. Additionally, I studied public responses to Aktion T4, looking at the opposition from Cardinal Clemens von Galen through his sermons and personal statements from individuals working with the disabled, highlighting both their complicity and regret in Aktion T4. Ultimately, this research demonstrates that Aktion T4 not only laid the foundations for the Holocaust but also serves as a case study for examining the dangers of medical genocide, exposing how scientific rhetoric and systemic exclusion were weaponized to justify mass extermination.

## Protein Interaction of Myosin VIIA and Singed in *Drosophila Melanogaster*

*Charlotte Kumler '25, Biology*  
*Advisor: Jennifer Sallee*

*Drosophila melanogaster* is used as a model system to manipulate and study actin-based protrusions as they have many homologous genes to humans. Myosin VIIA is a actin-based motor protein with multiple C-terminal protein-protein binding domains that are suspected to carry other proteins along the actin cytoskeleton. Singed is an actin bundling protein that assists in bundling actin filaments. When either Myosin VIIA or Singed gene is mutated, actin-based protrusions are altered in shape and function. We wanted to test whether Myosin VIIA is binding to Singed. Adult fly's expressing a Histidine-tagged Myosin VIIA and a GFP-tagged Singed were lysed. Using an affinity pull-down assay for the His-tag on the Myosin VIIA, we aimed to isolate Myosin VIIA then test for Signed binding. Proteins were separated by SDS-page and detected by western blotting for the tag on Myosin VIIA. Myosin VIIA was not successfully isolated, so no protein-protein interactions were identified.

## Using Geographic Information Systems to Address Village Infrastructure Needs in Masumbi, Kenya

*Amelia Cook '26, Environmental Studies*  
*Advisor: Reed Perkins*

Siaya County in southwest Kenya (population approximately one million) has the country's highest rates of morbidity and mortality due to infectious diseases. This is likely related to a lack of access to hygienic toilets. This problem is disproportionately greater in rural areas, such as the village of Masumbi in Siaya County. The aim of this research project was to determine suitable places to situate new public toilet facilities in Masumbi, using search criteria provided by Masumbi resident (and former visiting North Central student, Mr. Ian Adipo): proximity to roads, schools, and houses, as well as separation from other possible toilet sites and rivers. We used the Geographic Information System software ArcGIS Pro to conduct a suitability assessment. Only two locations meet the original criteria, indicating a need for continued discussion and analysis.

## Does Game Attendance and Percentage of Top Ranked Players Increase an NFL Team's Winning Record?

*\*Lucy Culig '25, Accounting*  
*Jessica Pesavento '25, Finance*  
*Garrett Grastorf '25, Business Economics*  
*Advisor: Najrin Khanom*

This econometrics research paper is aimed at analyzing the relationship between NFL teams' wins per season based on their attendance, in combination with the Top 100 Players a team has on their roster. In addition, the analysis controls for team spending and the population of the home city of the team. This study is conducted using data from the 2023 NFL season, with the goal of utilizing timely and relevant data. The findings from the analysis indicate that there is a positive and significant relationship between team wins, each team's spending, and the percentage of top-ranked players on each team's roster, while there was an insignificant relationship with game attendance. Adversely, there was a negative relationship between city population and team wins.

## Redefining Gender and Sexuality: The Evolution of Women's Roles in New German Cinema

*Addison Daugherty '28, Graphic Design*  
*Advisor: Gregory H. Wolf*

The portrayal of women's sexuality and gender roles during the period of New German Cinema (1960s-1980s) reflects a societal shift from the patriarchal censorship of women towards a more fluid and sexual portrayal that confronted viewers with their own misogyny. As scholar Richard M. McCormick put it in his research, "Weimar cinema not only is often strikingly misogynistic, but many of its films openly call attention so phenomena such as...the objectification of the female, and the castration anxiety of the male." In this project, I examine female characters from *The Blue Angel*, *Wings of Desire*, and *Nosferatu* works from filmmakers Rainer Werner Fassbinder, Werner Herzog, and Wim Wenders. They challenged cultural expectations and bodily autonomy through characters such as Lola Lola and Lucy; I will discuss similarities such as their reliance on sexuality to achieve their goals, as well as the differences in the characters' ultimate goals (marriage versus independence).

## The Experiences of Children During the Holocaust: Survival, Suffering, and Resilience in Concentration Camps

*Victoria Del Carmen '26, Social Science/History and Secondary Education*  
*Advisor: Shereen Ilahi*

My research investigates the experiences of young adolescents ranging from seven to fifteen years old, who were forcibly removed from their homes and deported to Nazi labor and death camps such as Auschwitz-Birkenau, Sachsenhausen, and Mauthausen. I also explore the emotional and physical trauma resulting from being experimented on, forced labor, exposure to disease, malnourishment, harsh conditions, dehumanizing treatment, and family separation. I use the historical method by analyzing primary sources such as survivor testimonies, diaries, and firsthand accounts by children in the camps about what they experienced. Grueling labor under extreme conditions often resulted in illness, injury, and

psychological damage. My findings reveal the long-lasting effects of these experiences emphasizing how they contributed to generational trauma.

## The Iconography of Indoctrination: The Hitler Youth and Organization of German Girls

*Danny DiMartino '28, Actuarial Science*  
*Advisor: Gregory H. Wolf*

After Adolf Hitler and the National Socialists came to power through legal maneuvering in Germany in 1933, they systematically dismantled democratic institutions. They created the Hitler Youth (HJ) and the Organization of German Girls (BdM) to indoctrinate the youth with Nazi ideology. My research examines the visual representations of these organizations. I argue that the iconography of the HJ and BdM promoted National Socialist ideology by fostering demagoguery, violence, and a militarized culture. These youth organizations' stress on the physical body, sport, and exercise promoted Nazi objectives by cultivating obedience and nationalism. The Hitler Youth shaped Germany's boys into future soldiers while the BdM molded girls into devoted Nazi loyalists and mothers. I analyze political, sport, and Hitler Youth art, propaganda photos from Anna Koppitz, and film. Furthermore, I explore the influence those items had on the creation of a Volksgemeinschaft, a society founded on Aryan racial theory.

## Competition Between Metal Ions for Adsorption Sites on Exhausted Coffee Grounds

*\*Allie Dockins '25, Biochemistry*  
*\*Brian Sorg '27, Environmental Science*  
*Advisor: Rebecca Sanders*

Water contamination from heavy metal ions is a global issue. Exhausted coffee grounds (ECGs), a porous and abundant waste material, offer a sustainable solution for absorbing metal ions in water. This study examined ECG's ability to remove copper(II), nickel(II), and zinc(II) ions in multicomponent solutions. Batch adsorption experiments at pH 5.5 showed ECGs had higher absorption capacity for Cu(II) (0.12 mmol/g) than Ni(II) and Zn(II) (0.07-0.08 mmol/g) in monocomponent systems. In multicomponent systems, Cu(II) absorption remained similar, but Ni(II) and Zn(II) capacities decreased by 67% and 75%, respectively, indicating Cu(II) outcompetes other ions for binding sites. Competitive experiments revealed ECG's affinity followed the order Cu(II) > Ni(II) > Zn(II). These findings highlight ECG's potential for water treatment but emphasize the need to consider preferential adsorption in multicomponent systems when addressing real-world water contamination.

## The Modern Colonization of Therapy

*Miranda Dominguez '27, Economics and French Horn Performance*  
*Advisor: John Stanley*

We have seen a rise in efforts to prioritize mental health. However, the practices within therapy as an institution largely exclude people of color. The majority of mental health professionals in the U.S. workforce are white, leading to instances of implicit bias for those seeking treatment. Through a literature review of scholarly journals, articles, and organizations within the psychology field, this presentation analyzes the causes of the modern colonization of therapy including barriers to entry in

the field and the cultural stigma within BIPOC communities, the resulting mental health crises that disproportionately impact minorities, and proposes solutions at an institutional and personal level. Increasing implicit bias training within the psychology field and offering mentorship programs can remove systemic barriers for minority students seeking to become professionals, which will allow the discussion of mental health to reach BIPOC communities and improve the accessibility of therapy.

## Engaging All Students: Supporting Anxious and Neurodiverse Learners in the Writing and Speaking Centers

*Rebecca Elsen '25, English Literature*  
*Advisor: Jennifer Smith*

Since the pandemic, the number of anxious and neurodiverse students utilizing peer tutoring services through the North Central College Writing and Speaking Centers is increasing. General tutor training programs, however, do not always accommodate neurodiversity. Hence, including training that attends to the specific needs of this student community is vital. This project aims to provide evidence-based techniques for Writing and Speaking Center tutors to implement during tutorials. Informed by current peer-tutoring pedagogy and praxis, as well as disability studies, the findings of this research support the use of both directive and nondirective tutoring approaches. Additionally, a flexible physical environment, tutors' use of open nonverbal communication, and the integration of both verbal and written feedback are particularly effective strategies. These research findings were presented to tutors at both Centers in a workshop format and will be used in new tutor training in the future.

## Invertebrate Host Species Shed Saprolegniaceae Zoospores into Aquatic Environments at Varying Rates

*Hannah Galletti '27, Biology*  
*Advisor: Gregory Ruthig*

Multihost pathogens are important in ecological communities. Using water molds as a model species, we measured the rate at which invertebrate hosts release infective propagules into bodies of water, or their shedding rate. We found that the mean shedding rate varies between species. Frequency distributions showed low shedding rates but high variance, and some individual hosts had a higher shedding rate than would be expected by random variability. Whether water molds act as a pathogen or saprobe may vary between host species. By exploring the relationship between shedding rate and invertebrate hosts, we can formulate an epidemiological model to predict ecosystem interactions involving water-borne pathogens.

## Doping NASICON with Yttrium for Samples with High Density and Ion Mobility, while Maintaining Low Levels of Impurities

*Drazen Gierman '26, Mechanical Engineering*  
*Advisor: Shan-Ju Chiang*

The development of solid-state batteries has garnered attention as a feasible energy storage solution for the next generation of battery powered devices. Solid state batteries, specifically solid electrolyte NASICON (Sodium Ion Super Conductors) have the potential for higher energy density, improved lifespan,

and higher structural stability under extreme conditions. However, achieving physically dense samples with Yttrium-doped NASICON has been challenging. This study investigates the effect of Yttrium doping and ball milling conditions on NASICON following the formula  $\text{Na}_3\text{Zr}_{1.8}\text{Y}_{0.1}\text{Si}_2\text{PO}_{12}$  and three milling times (3, 6, and 9 hours). After milling, the samples were pelletized, sintered, and their density was recorded. SEM and X-Ray spectrometry tests were used to determine which condition yielded the lowest percentage of impurities and highest Ion mobility. The study proved that the nine-hour milling condition yielded NASICON purities upwards of 97.5%, near 100% density, and the highest ion mobility, making it most suitable for real world applications.

## The Pathogenic and Saprobic Effects of Water Mold on Host Species

*\*Dallas Gillson '26, Biology: Biomedical Science*

*\*Evelyn Kandler '26, Biochemistry*

*Advisor: Gregory Ruthig*

Infectious pathogenic microorganisms called water molds are common inhabitants of aquatic ecosystems and infect native amphibians and other aquatic organisms. We performed a challenge experiment that exposed living and dead backswimmer insects to four different concentrations of water mold. After exposure, we measured the shedding rate of water mold zoospores of infected hosts. We found that living backswimmers shed fewer zoospores than dead backswimmers, suggesting that water molds prefer to colonize dead hosts in a saprobic relationship. Living specimens' shedding rate increased over time, however many individuals in this group died before the last collection interval. The concentration of zoospores that hosts were exposed to showed little effect on their subsequent shedding rate. Backswimmers are one of many potential host species for pathogenic water molds. Understanding the relationship between invertebrate hosts and water molds can help reveal the infectious disease dynamics of other water-borne microorganisms.

## Pamphlets of Faith and Defiance: The White Rose Nonviolent Resistance Against the Nazi Regime, 1942-1943

*Mia Giometti '26, Social Science/History and Secondary Education*

*Advisor: Shereen Ilahi*

My research discusses the nonviolent actions of the White Rose, a group of college-aged students and faculty unified by their shared Christian beliefs, to protest the Nazi Regime. The White Rose formed in 1942 at the University of Munich and carried out a sequence of pamphlet campaigns criticizing the Nazis. In 1943, a handful of members were discovered by the Gestapo and executed, ending the movement. The pamphlets urged Germans to passively resist the regime. In my original research, I analyze primary sources written in German and translated into English, such as the White Rose pamphlets, letters, newspaper articles, and diary entries, to argue that despite their short existence, the White Rose left a legacy of nonviolent resistance to fascism and reminds us that not every ordinary German supported the regime.



## Gender Differences in Support for Bathroom Bills

*\*Arron Hanson '25, Psychology*

*\*Kyla Smetana '25, Psychology*

*\*Emily Mostaccio '26, Psychology*

*Advisor: Claudia Peter-Hagene*

Legislative efforts to pass “bathroom bills” (laws prohibiting transgender individuals from using gender-congruent public bathrooms) are ostensibly motivated by concerns with women’s safety. In a correlational study, we investigated psychological predictors of bathroom-bill support for men and women. Women are more prone than men to experience disgust and threat, both predictors of anti-LGBTQ+ prejudice. But men espouse more negative feelings (i.e., prejudice) toward transgender individuals. Thus, bathroom-bill support might be predicted by anti-trans prejudice for men, but by threat and disgust for women. Participants completed measures of bathroom-bill support, disgust sensitivity, perceived societal threat, and prejudice. Results indicated that for men, bathroom-bill support is predicted by anti-transgender prejudice, while for women support is predicted by perceived societal threat. Understanding how different psychological mechanisms predict support for prohibitive legislation can help shape how policy makers communicate to the public to address the current trend of prohibitive legislation toward this group.

## Undernourished Male Cricket Mating Songs Fall Flat

*\*Cleo Hawthorne '25, Biology & Biological Sciences*

*Charlotte Kumler '25, Biology*

*Advisor: Chandreyee Mitra*

The developmental resources available to individuals throughout their lives affect their adult fitness. Males often only get to mate if they successfully attract a female. Females prefer certain male characteristics, which can be associated with better male condition. In crickets, females choose which males to mate with based partly on the song a male produces, and these songs can vary with diet and environmental conditions in many species. Nymphs of the tropical house cricket, *Gryllodes sigillatus*, were put on diets within a week after hatching, either ground cat food, or 50/50 ground cat food and cellulose. We tested how variation in diet throughout a cricket’s life changes how attractive their songs are to females. We found that diet did not affect any of the song characteristics tested. This species demonstrated resilience to song variation, unlike many closely related species, which may explain its success in being naturalized throughout the world.

## Project Purple: A New Take on an Ancient Pigment

*\*Holly Helmers '26, Biology: Biomedical Science*

*\*Mark Horton '26, Chemistry*

*Advisor: Nicholas Boaz*

Tyrian purple, 6, 6'-dibromoindigo, has been a symbol of wealth for centuries. Traditionally this dye was produced from a gland from murex snails, but this method required thousands of snails and intense labor. More recently, this molecule has been produced synthetically; however, the synthetic method is low yielding, contains multiple steps and requires toxic chromium-based reagents. In this work we report a novel synthetic pathway that is free of chromium oxidants, demonstrates improved yields, and only requires four steps. Additionally, we show that sulfonation of 6, 6'-dibromoindigo is possible, yielding a

water-soluble analogue, although the appearance of the dye shifts from purple to sky blue upon the addition of sulfonic acid groups.

## Medusa's Many Faces: The Male Gaze, Perfect Victims, and a Symbol for Survivors

*Lucie Jumonville '27, Studio Art*

*Advisor: Mike de Brauw*

My piece, Monster. Victim. Protector. is a digital collage that explores changing representations of Medusa from classical antiquity to the modern ages. It is also a comment on Luciano Garbati's Medusa with the Head of Perseus (2007). Medusa's portrayals have ranged from monstrous to idealized beauty in response to artistic trends and shifts in cultural standing. Recently, due to the #MeToo movement, Medusa has come to be a symbol for survivors of sexual assault, which lead to Garbati's Medusa gaining new fame. Garbati's sculpture portrays Medusa in Heroic Nudity thereby partaking in a long artistic tradition, but by doing so he contradicts the feminist message of his work. Garbati's idealized Medusa perpetuates the idea of victims needing to be palatable to be supported and ignores a history of Medusa serving an apotropaic (protective) function. Additionally, the sculpture's idealized appearance fits into conventional beauty standards and appeals to the 'male gaze.'

## Oral Session: 9:35 – 10:55 a.m.

*Wentz Science Center Classrooms*

## Historical Perspectives

*Moderator: Shereen Ilahi*

*Location: WSC 354*

## Divorced, Beheaded, Died, Divorced...But Why?: German Painter Hans Holbein The Younger's Portrait of Anne of Cleves

*Marina Jòkanović '26, Art History and Acting*

*Advisor: Gregory H. Wolf*

Anne of Cleves' place in history was dictated by her brief marriage to Henry VIII, leaving her remembered simply as "Divorced." Some may say she was framed—this project explores how she, quite literally, was. Building on the scholarship of Stephanie Buck, Susan Foister, and Michael North, my research examines Hans Holbein the Younger, the medieval German painter known for his striking realism. As Henry VIII's court artist, Holbein was tasked with painting Anne's portrait, which allegedly misled the king, leading to a very famous "catfishing" scandal. Through visual analysis, contemporary descriptions, and comparisons with portraits of Henry's other wives, I explore Holbein's artistic choices, the balance between realism and flattery, and Tudor beauty standards. I argue that Anne's portrait was not inaccurate but that Henry's expectations, shaped by politics and ideals of beauty, fueled the legend of Anne as "The Flanders Mare."

## Out on Campus: Early LGBTQ+ Activism at North Central College

*Nicole Mendez-Villarrubia '25, Journalism and Media Communication*  
*Advisor: Steve Macek*

My research explores the origins of OUTreach, an LGBTQ+ and allied student organization at North Central College, situating it within the sociopolitical climate on campus and history of LGBTQ+ student activism in the United States. I utilized mixed methods including archival research, literature review, and interviews. Specifically, I examined past issues of The Chronicle, NCC's student newspaper, and collected oral histories from members and faculty advisors to create a timeline of their activism which centered their lived experiences. The result is a historical narrative that details how OUTreach and its predecessors facilitated LGBTQ+ inclusion on campus by creating networks of care, educating the broader community, and increasing queer visibility.

## Causes of the Salem Witch Trials

*Milam Phills '26, Secondary Education and Social Science/History*  
*Advisor: Bruce Janacek*

The Salem Witch Trials were a sequence of investigations and prosecutions for the crime of witchcraft that were held from 1692- 1693. The question I am asking is, what caused the 1692-1693 Salem Witch Trials? To answer this question I have been researching seventeenth-century diseases. In my research I learned that a woman named Tituba was accused of feeding a young girl a meal that included rye, a grain commonly consumed in the American colonies. After eating this meal the girl started experiencing convulsions. The significance of this was that in the seventeenth century, the fungus known as ergot was often found in rye. Convulsions and psychosis are symptoms of ergot poisoning. I am arguing that consumption of contaminated rye may have led to Tituba being accused of witchcraft and could have been one of the causes that sparked the craze of the Salem Witch Trials.

## The Use of Magic in Tudor England

*Courtney Czuprynski '25, History*  
*Advisor: Bruce Janacek*

Non-specialists may assume that occult beliefs were held solely by unlearned people. However, learned elites held occult beliefs too. Indeed, occult beliefs in general, astrology in particular, saturated individuals' lives. My research intends to demonstrate that during the Tudor monarchy in England (1485-1603), occult practices, particularly astrology, were accepted political implements in the Tudor court. For these reasons, court astrologers had to tread lightly, having to be careful with what information they provided to the monarchs. My research demonstrates how Tudor monarchs navigated these complicated waters to still take advantage of the occult practice of astrology to govern England successfully. My research also intends to highlight the ways the court astrologers worked to help Tudor monarchs, with a variety of difficult decisions they made during their reign. Choosing propitious dates for dynastic marriages and choosing Elizabeth I's coronation date are examples of the practical role astrologers played in the Tudor court.

## Emotions, Ethics, and Philosophy

Moderator: Quanisha Charles

Location: WSC 104

### “I Feel, Therefore I Can Be Free”: Audre Lorde and the Liberatory Power of Centering Emotions

Ashlyn Allemand '25, Sociology

Advisor: Jennifer Smith

René Descartes’s well-known claim “I think, therefore I am” distills a foundational truth with the Enlightenment. His statement argues that existence is solely based on the rational mind, failing to consider the value of emotions. As these ideals continue to be perpetuated, Eurocentric and racist tendencies continue to prioritize intellectual thinking over emotional intuitiveness. Conversely, Audre Lorde’s emotional epistemology counters this long-established form of knowledge. Drawing upon her work *Sister Outsider*, my project examines Lorde’s framing of emotional liberation, examining how her ideas resonate on both an individual and societal level. From this foundation, this thesis analyzes the repercussions of discrediting emotional vulnerability, specifically the resulting mind-body dualism that pervades our present-day political and social discourses. Lorde’s outlook envisions a world where rational and emotional dimensions coexist harmoniously, establishing stronger, more honest truths.

### The Function of Filial Piety in the Analects of Confucius

John Spatara '26, Shimer: Humanities and Environmental Studies

Advisor: Daniela Barberis

This paper examines the concept of filial piety (xiào) as it is found in the Analects of Confucius, arguing that its function extends beyond the nuclear family to serve as the foundation of the well-ordered state in Confucian thought. Through close analysis of key passages in the Analects, I will argue that filial piety operates as a microcosm of ideal state governance, with parent-child relationships reflecting the dynamics exhibited between ruler and subject. The investigation reveals that filial piety serves to promote the sacralization of family relationships while teaching children the core Confucian virtue of Humanity (rén). The paper will also address some shortcomings of filial piety, specifically concerns about its patriarchal undergirding and parental overreach. The study concludes that the object of filial piety is to promote widespread societal harmony and welfare, beginning with the family unit through the cultivation of reverent, ritualized relationships.

### Behind the Stripes: A Virtue Theory Analysis of NCC's Men's Cross Country Team

Kyle Mudler '25, Biochemistry

Advisor: Perry Hamalis

Participation in voluntary communities can contribute significantly to a person’s moral formation and development. North Central College’s Men’s Cross Country team is a voluntary community that has been celebrated both for its athletic success and for its formative effect upon its members. However, to date, the team’s culture of excellence has not been examined through the lens of moral theory.

This thesis studies NCC's Men's Cross Country team through the lens of Aristotelian virtue ethics. My analysis of the team's motto, values, and communal practices reveals their deeply "Aristotelian" character as well as the heuristic value of the Aristotelian concepts of moral virtue, friendship, and moral exemplars to understanding the team's success. By articulating these insights, I provide a theoretical structure that could help preserve the team's future success and that could be used by other voluntary communities that are striving for both athletic and moral excellence.

## Executive/Leading Women and Their Relationship to Apologies in the Workplace

*Olivia Rosenberg '25, Communication and Sociology*  
*Advisor: Mara Berkland*

This research is about the relationship between executive/leading women and apologies to better understand how these communication patterns function in relation to the often-marginalized positions that women hold in the workforce. Because the number of women in executive positions are small, their perspectives can not only act as a blueprint to those following in their footsteps, but they can also serve as a window into the oppression they have faced. The research methodology was qualitative, using focus groups and interviews to collect data. Two themes emerged: strategic outcome manipulation and hypercritical awareness of behavior. Participants demonstrated a range of mitigation strategies based on the desired outcome of their apologies, shaped by their perceived relationship with the recipient. Strategies included relationship maintenance, face-saving, conflict mitigation, power negotiation, and accountability. Participants exhibited heightened consciousness regarding their apology habits through questioning, rejection of norms, reflection on personal habits, and identification of group norms.

## Health and Fitness

*Moderator: Rachel Luehrs*  
*Location: WSC 010*

## Comparing Cardiorespiratory Fitness Levels Between First Generation and Continuing Generation College Students

*Francesca Whalen '25, Exercise Science*  
*Advisor: Rachel Luehrs*

In the United States, individuals of low socioeconomic status experience decreased resources and safety when it comes to physical activity. First-Generation (FG) college students are more likely to be of low socioeconomic status, and experience increased barriers to physical activity as compared to continuing-generation (CG) students. We hypothesized that FG students have lower cardiorespiratory fitness compared to CG students. Fifty-one students participated in this study which consisted of a health screening questionnaire, a one mile walk test, height and weight measurements, and a survey. An Independent Samples T-Test showed that FG students have lower cardiorespiratory fitness compared to CG students ( $t=-2.301$ ,  $p=0.026$ ). A one-way ANOVA with a post hoc analysis demonstrated that compared to CG athletes, FG non-athletes had lower cardiorespiratory fitness levels ( $F= 3.045$ ;  $p= 0.038$ ).



Further analyses should explore barriers that FG non-athletes face that cause them to have a lower level of cardiorespiratory fitness.

## Accessibility to Athletic Trainers and AEDs in Preventing Sudden Cardiac Death: A Critically Appraised Topic

*Corine Hamilton '26, Masters of Athletic Training*  
*Advisor: Taylor Arman*

While rare among athletes, sudden cardiac death (SCD) is a devastating medical event. Athletic venues lacking a well-developed emergency action plan (EAP), access to an automated external defibrillator (AED), or an athletic trainer (AT) have a higher incidence of SCD. This critically appraised topic seeks to answer the question: does enhancing access to an AED and athletic trainer at athletic and recreational venues decrease the risk of SCD in the active population? Three articles were selected according to the established inclusion and exclusion criteria. The articles received the following STROBE scores: 3a/20/22, 4B/18.5/22, and 2a/18/22. Based on this critical appraisal, the clinical bottom line is that having access to both an AT and an AED will improve the survival rate of individuals experiencing SCD at athletic and recreational venues. Understanding the necessity of AEDs and the role of ATs is crucial for the safety of physically active individuals.

## Exploring the Differences in Executive Functioning Between Athletes and Non-Athletes

*Amanda Melton '25, Psychology*  
*Advisor: Daniel VanHorn*

This study examines differences in executive functioning between athletes and non-athletes as well as how well self-reports of executive functioning match a validated test of executive functioning. Executive functioning is a set of cognitive skills and processes that help people manage their thinking and behavior including attentional control, emotion regulation, working memory, self-control, and mental flexibility. A quasi-experimental approach was used for this research. Athlete status (athlete and non-athlete) was used as our quasi-independent variable. The dependent variables included measures of executive functioning. Participants (n=66) began the study by completing a short demographics questionnaire and an executive functioning self-assessment. Next, they completed the Trails-X assessment (a validated test of executive functioning). Results suggest no significant executive functioning differences between athletes and non-athletes and a positive correlation between the Trails-X executive functioning assessment and self-reports of executive functioning.

## Aspects of the Justice System

Moderator: Raleigh Blasdel

Location: WSC 036

### Before the Badge: Hiring Practices of Midwestern Police Departments

Samantha Kaczmarek '25, Psychology, Criminology, and Sociology

Advisor: Raleigh Blasdel

For several years, police departments have been facing a crisis in recruitment and retention. This challenge has been exacerbated by public scrutiny of police hiring practices, especially following high-profile cases of police misconduct, such as the actions of Deputy Sean Grayson before his employment with the Sangamon County Sheriff's Office in Illinois. This project investigates the current practices of local departments by relying on interviews with police chiefs and comparing these practices with professional recommendations and best practices. Departments reported difficulties in recruiting and hiring new officers and heightened concerns about lateral transfers. These challenges have led to changes in applicant requirements, which vary depending on the department's size. The results also highlight connections between perceived community demographic representation and consideration of Diversity, Equity & Inclusion (DEI) in hiring practices, revealing contrasts in how departments perceive fairness in their recruitment and hiring processes. The implications of these patterns will be discussed.

### CIT Differences Between Municipal Police Departments

Ella Waughop '25, Psychology and Criminology

Advisor: Raleigh Blasdel

Crisis Intervention Training (CIT) was developed after the officer-involved death of Joseph Robinson, who had a history of mental illness and substance abuse, to improve police responses to people with mental illness (PMI). Research shows CIT training reduces police aggression and officer-involved fatalities towards PMI. However, many departments lack specialized CIT teams or training, and those with them have officers who have received varying training content, requirements, and teaching methods, which can lead to dangerous or deadly outcomes. This study examines the differences in CIT training within one medium-sized municipal department by surveying officers about training instructor qualifications, content, timing, format, and effectiveness. While all respondents recognized the importance of training for mental health crises, not all felt adequately equipped to handle situations involving PMI, and there were mixed opinions regarding the need for more training. These findings underscore the need for more standardized training and CIT programs.

### Factors Impacting Jury Decision-Making in Criminal Sentencing

Tiera Jimerson '25, Sociology and Criminology

Advisor: Raleigh Blasdel

Society plays a significant role in the justice system, with the critical task of serving on juries and using fair judgment for justice-involved persons. However, bias from stereotypes has corrupted court decisions, leading to unfair sentencing based on race. Little research exists on bias among the younger generation. This experiment utilizes college students as mock jurors to examine biases

regarding jury sentencing recommendations. Participants were randomly assigned three case files. Two served as the control in which case details remained consistent; researchers manipulated the offender and victim race in the third. While suggested sentences varied, the analyses indicated no statistically significant difference in the sentencing recommendations between the groups. Based on the review of case files alone, these results suggest that this population might exhibit less racial bias if brought in as a jury in court. This offers hope for a more just and fair justice system.

## Public Opinion on Correctional Education in U.S. Prisons

*Madeleine Hughes '25, Criminology and Sociology*  
*Advisor: Raleigh Blasdel*

This study examined public opinion of educational programs within United States prisons. While existing research demonstrates the benefits of correctional education programs to both offenders and their communities, access to these programs is not guaranteed, as fluctuating political positions surrounding crime and punishment lead to inconsistency of policy on correctional education programs. By exploring where support and opposition to these programs exist, the study can provide context for public ideologies on the subject. Data on participant demographics, preexisting knowledge, and personal beliefs regarding correctional education were collected through a self-administered digital survey. Results indicate that apart from post-secondary education, respondents were overwhelmingly supportive of prison education, and that participant knowledge of justice system realities did not produce a statistically significant impact on this support. The documentation of public support may be used in the future to advocate for greater universality of correctional education programs in the U.S.

## Correlations and Causation

*Moderator: Miranda Mendiola Valdez*  
*Location: WSC 040*

## The Impact of the 2007 Global Financial Crisis on Trade Balances Across Economies

*\*Jai Acharya '25, Accounting and Economics*  
*\*Sergio Bracco '25, Finance and Business Economics*  
*Advisor: Miranda Mendiola*

The 2007 financial crisis significantly impacted global trade balances, with varying effects across regions. This study employs a panel data approach to examine how trade balances—exports and imports—responded to key macroeconomic factors before, during, and after the crisis. Using a fixed-effects model, we analyze the impact of Exchange Rates, Gross Domestic Product (GDP) growth, Inflation, Real Interest Rates, and Population Growth across major economies, including the U.S., U.K., Germany, France, Spain, and India. A difference-in-differences (DiD) framework assesses whether these economies experienced distinct trade shocks compared to others with relatively stable trade balances. Our findings provide insights into the persistence of crisis-induced trade imbalances and the long-term effects of macroeconomic disruptions on global trade. Based on our results, we conclude that certain policy recommendations can be made to help mitigate the risks of future financial crises and their effects on global trade stability.

# Magnetic Fields' Influence on Stellar Activity: An Inquiry into the Relationship Between Stellar Class and Stellar Activity

*\*Samuel Salvador '26, Philosophy  
Brian Vargas (Lewis University)  
Advisor: Paul Bloom*

Our paper set out to investigate any potential correlational relationship between solar activity and a star's spectral class and age along the main sequence. It is well established that magnetic fields are the primary agent behind solar activity, but how does the spectral class and age of stars affect the strength of their magnetic field? This project discusses how a star's magnetic field is influenced by the star's age on the H-R Diagram and rotational period. We also briefly discuss how mass loss due to CMEs affects angular momentum and what consequences that has on stellar activity. We observed stars' average variability (flux in watts per square meter) in the OBAFGKM H-R Diagram spectral classes along with its rotation period and mass using NVKTL. Furthermore, we utilized the virial theorem to calculate the differences in gravitational potential energy. Findings: surprisingly, larger stars have less stellar activity.

# Altered Perception: The Effect of Resume Quality on Disabled Applicants in Online Interviews

*Allison Bobek '26, Molecular Neuroscience  
Advisor: Karl Kelley*

Existing research in Industrial-Organizational Psychology suggests that both resume quality and disability status impact hiring outcomes, yet the interaction between these factors remains underexplored. Studies indicate that higher resume quality typically leads to better evaluations, while disability status may introduce biases that affect interviewer decisions. However, little is known about how resume quality and disability status interact, or how interviewer biases influence these interactions. Additionally, research on perceived job performance has shown that both factors influence hiring decisions, but the underlying mechanisms are unclear. This study seeks to address the gap in the literature by investigating how resume quality, disability status, and interviewer biases interact to shape perceptions of an applicant's potential for job performance. The findings are expected to provide new insights into the challenges disabled applicants face in the hiring process and contribute to disability studies within the workplace.

## Our Home as a Lab

*Moderator: Joanna Weremijewicz  
Location: WSC 013*

# Where Are the Women? Analyzing the Inclusion of Women-Identifying Authors in North Central College Syllabi

*Elisabeth Gardner '25, Political Science  
Advisor: Suzanne Chod*

This thesis examines the representation of female-identifying authors in syllabi in the College of Arts and Sciences at North Central College in Fall 2024. Based on reading lists from professors willing to share

their syllabi, it compares the inclusion of male-identifying authors versus female-identifying authors. By conducting content analysis and statistical evaluation in the frameworks offered by an extensive literature review, this study identifies patterns in gender representation and explores their implications for academic discourse. The key finding that women are underrepresented in these courses contributes to broader discussions of gender in higher education. Ultimately, this project provides recommendations for increasing the visibility of female-identifying authors in college courses, which would enrich students' intellectual development.

## Arbuscular Mycorrhizal Fungi Abundance Differs Based on Inoculation in a Post-Agricultural Restoration

*Ian Rosales '25, Biology: Biological Science*  
*Advisor: Joanna Weremijewicz*

Arbuscular mycorrhizal (AM) fungi form symbiotic relationships with vascular plants around the world, receiving carbon from their hosts and providing mineral nutrients. The benefits of the AM symbiosis make it a useful tool in post-agricultural prairie restorations. In our experiment, AM fungus inoculum was added to a post-agricultural prairie restoration at two concentrations. We then used an AM-specific lipid biomarker (C16:1 $\omega$ 5) to examine how successful they were in establishing post-inoculation. We found that high and low inoculation treatments differed from each other but did not differ from a control. Additionally, C16:1 $\omega$ 5 quantities were positively correlated with plant biodiversity, suggesting that AM fungus inoculation as a restoration effort is beneficial for plant species recovery. However, competition among the added and existing AM fungus species may affect AM fungus establishment. We suggest inoculating with greater inoculum amounts than the amounts used in our study for future post-agricultural prairie restoration attempts.

## Using Geographic Information Systems to Document Healthcare Equity in Chicago

*Elizabeth Watts '27, Environmental Business*  
*Advisor: Reed Perkins*

The prosperity of a city is reflected not only in its financial success but in the health of its citizens. The Chicago Department of Public Health has divided the city into six Healthy Chicago Equity Zones (HCEZ) in an effort to close Chicago's racial life expectancy gap. A separate research project examined the spatial correlation across these HCEZ between the Center for Disease Control's Social Vulnerability Index (SVI) and rates of cancer. SVI integrates socioeconomic status, minority status, household composition, disability, housing type, and transportation access. Our results reveal a highly variable correlation between SVI level and cancer rate across Chicago. Armed with this knowledge, further geospatial analysis can be done to connect Chicagoans facing cancer to the resources needed to improve the city's healthcare equity. "Six Regions. One Chicago."



# Beyond Barriers: Understanding and Improving Diabetes Care for Undocumented Migrants in Illinois

*Jasmine Tixta '25, Health Science*  
*Advisor: Nicole Rivera*

As the migrant population continues to increase in Illinois, it is more important than ever to understand the health outcomes of undocumented migrants and to take action to better their healthcare; especially when it involves a life-long disease like diabetes mellitus. Much research exists on barriers and utilization rates, yet the rates of migrants not getting care continue to rise. This project sets out to highlight the urgency and need to educate future health professionals. Through an extensive review of literature I find that the best approach to tackling healthcare inequities in migrant diabetes care begins at the forefront by providing future healthcare providers with tools, resources, and strategies, as well as educating on the importance and impact of reinforced education. Therefore, I argue that there is an important gap to be filled that provides a comprehensive list of tools, resources, and strategies focused on the Latinx undocumented immigrant population.

## Cinema and Music

*Moderator: Jonathon Kirk*  
*Location: WSC 356*

# The Excruciating Importance of Pretension: Thomas Vinterberg and the Dubious Path Toward Moderation

*Dominick Gramarosso '25, English Writing*  
*Advisor: Saul Kutnicki*

The 1990's Danish film movement, 'Dogma 95,' was a failed experiment attempting to combat Hollywood's conventional genre-filmmaking. Led by four filmmakers, including Thomas Vinterberg, their intention was to strip down the production process (e.g. limiting lighting, sound, and cinematography techniques) to achieve a higher level of cinematic truth, as outlined in the movement's strict manifesto. However, years after the toxic disbandment of 'Dogma 95,' Vinterberg's Oscar winning feature, 'Another Round' (2020), tells a parable which critiques the excessive constraints that he and his peers were committed to. While not a 'Dogma 95' film, 'Another Round' was heavily influenced by the intentions of the movement, executing its vision without being burdened by its limitations. Drawing upon Aristotelian Ethics, my project uses the concept of moderation to define 'Another Round' as a work where Vinterberg remains effectively balanced between an excess of pretension and a deficiency of effort.

# The Cinematic Code of Silence: Omertà, Mafia Myths, and Italian Identity

*Paytyn Bavaro '25, Anthropology*  
*Advisor: Matthew Krystal*

The phrase "we don't talk about it" has transcended its criminal origins to become a defining characteristic of Italian identity in the public imagination, distorting the diverse realities of Italian and Italian-American life. This study examines how omertà and Mafia culture are constructed in film,

reinforcing the perception of the Mafia as an inescapable part of Italian-American identity. Through anthropological approaches to film analysis, this research critically engages with dialogue, setting, and shot composition to explore how media perpetuates these associations. By coding cinematic portrayals of omertà, I analyze how silence, secrecy, and loyalty shape not only on-screen narratives but also broader perceptions of Italian communities. Preliminary findings reveal that media portrayals of Italians, like those of any ethnic group, require critical scrutiny rather than passive consumption. In a cultural moment where diversity efforts face political backlash, this study highlights how reductive stereotypes define ethnic groups and reinforce exclusionary narratives.

## A Theoretical Analysis of Neil Young as a Singer-Songwriter

*Rowan Brandou '26, Music Performance and Theatre*  
*Advisor: Jonathan Kirk*

Neo-Riemannian analysis departs from traditional formalist analysis in favor of examining the relationship between chords through voice leading, which can be applied to the music of singer-songwriter Neil Young to decode the specific transformations between his chord progressions that may remain obscured in traditional roman numeral analysis. The six Neo-Riemmanian transformations (P, L, R, N, S, H) foster understanding of the relationship of chords outside of their relation to the tonic. Identifying these transformations in the harmonic and modal schemas Young uses reveal where his music deviates from the pop theoretical norms. Songs such as Old Man from Harvest (1972) and Don't Let it Bring You Down from After the Gold Rush (1970), demonstrate unique harmonic schemas and pedal point in the context of 1970s folk rock. By applying this analytical framework, one can gain unique insight into the structure of Young's unexpected harmonic schemas.

## Music: The Soundtrack (And Product) of Our Lives

*Zachary Scalafini '26, Music Composition*  
*Advisor: Yu Zheng*

"Your attention and time are finite. What makes you want to listen to one type of music as opposed to another? The answer, you don't; Corporate influences change how we spend our time and money on certain genres of music, controlling music and our music culture. My project explores the worth of music, both sociopolitical and socioeconomic. Using written sources such as Noise: The Political Economy Of Music, Free Culture: How Big Media Uses Technology And The Law To Lock Down Culture And Control Creativity, and All You Need To Know About The Music Business, these secondary sources set the stage in explaining how coordinated music, state power, and capitalism are concerted together. This idea is supported by interviews with those, "in the Industry." I present how legal power and money are the main factors that work in tandem with each other."

## Politics, Doctrine, and Influence

*Moderator: William Muck*

*Location: WSC 034*

### The "Yon-Fluenza" Outbreak in Japan: A Crucial Display of South Korean Soft Power Through One K-Drama

*Maxine Ocampo '25, Global Studies*

*Advisor: William Muck*

The most active users of soft power is South Korea, the focal point of the Korean Wave. Scholarship regarding this phenomenon mainly focuses on K-pop, but a significant aspect that has not been explored as in depth as K-pop is K-dramas. This lack of scholarship regarding K-dramas inhibits our capability to fully understand the effect of South Korea's soft power hold in the international system. The following research attempts to highlight how K dramas created opportunities of soft power for South Korea by breaking down Japan's "Winter Sonata" case study where this K-drama influenced the relations between South Korea and Japan. Literature such as newspapers and articles, as well as data from previously conducted interviews and surveys are being used to display South Korea's capacity of soft power. The results indicate that soft power from Korean dramas has had a meaningful impact in altering foreign policy dynamics for South Korea.

### A (MAD)der World: Practiced Nuclear Doctrine or Lip Service?

*Ethan Garard '25, Political Science*

*Advisor: Suzanne Chod*

To determine the applicability of Mutually Assured Destruction (M.A.D.) in today's geopolitical landscape, this study analyzed the evolution of rhetorical nuclear doctrines across the Cold War administrations (1945-1991) of the United States. This study catalogued nuclear doctrines throughout the Cold War to determine whether M.A.D. was adhered to in rhetorical foreign policy, as well as highlight the similarities and differences of doctrines across administrations. I reviewed national speeches of United States presidents to determine the operationalization of M.A.D. as spoken foreign policy. Examining speeches uncovered the methods in which Cold War presidents adhered to the tenets of M.A.D. and helped identify a new tenet of M.A.D. adherence – desire for/engagement in diplomacy. These methods of adhering to mutually assured destruction - along with acknowledging the importance of engaging in diplomacy - within nuclear foreign policy speeches can help identify the spoken policies and desired outcomes of current world leaders' foreign policies.

### Navigating the Nexus of Knowledge, Polarization, and Legitimacy: A Survey Experiment on the American Public's Perception of the U.S. Supreme Court

*Victoria Leonard '25, Global Studies and Chinese*

*Advisor: Suzanne Chod*

This study examines how public knowledge, polarization, and ideology influence perceptions of the U.S. Supreme Court's legitimacy. As the Court becomes more politicized, public trust in its neutrality has

declined. Using a survey experiment with priming, this research explores how exposure to information about the Court's ideological leanings affects views on its legitimacy and trustworthiness. The study hypothesizes that awareness of the Court's polarization will lower perceptions of legitimacy, particularly among those whose political views differ from its decisions. The findings support this: respondents exposed to the primed survey reported lower trust and legitimacy than those who were not. Additionally, individuals whose political beliefs aligned with the Court's ideological direction expressed higher trust and confidence. These results highlight how public opinion, shaped by political context and knowledge, influences perceptions of the Court. Motivated reasoning further explains these findings, as individuals interpret information in ways that reinforce their preexisting beliefs.

## Unveiling Sino-Kenyan Relations and the Paradox of Foreign Influence

*Elie Imani '25, Political Science*

*Advisor: William Muck*

This research examines the changing geopolitical and economic dynamics of Sino-Kenyan relations, thereby questioning the dominant Western narratives of Chinese neo-colonialism. This research, which was conducted at the University of Nairobi during the Maandamano protests, investigates reasons why public opinion in Kenya predominantly critiques Western financial institutions such as the International Monetary Fund, while Chinese influence remains generally unchallenged. Through qualitative interviews with business leaders and academics, the research uncovers a paradox: while China's infrastructure investments under the Belt and Road Initiative have transformed Kenya's urban landscape, their long-term consequences—rising debt, foreign labor dominance, and economic dependency—remain underexplored. The findings suggest that China's unique strategy of economic entrenchment, coupled with Kenya's historical distrust of Western financial institutions, has reshaped public perceptions of sovereignty and external influence. This study contributes to broader discussions on African agency in global geopolitics, emphasizing the necessity of regional economic strategies to counter external dependencies.

## Creative Endeavors

*Moderator: Rebecca Strang*

*Location: WSC 015*

## The Cards You Are Dealt

*Austin Scott '25, Graphic Design*

*Advisor: David Cordero*

The project aims to design a complete deck of cards, including packaging, inspired by my designer's family heritage. Each suit will represent a different branch of their family tree, blending Photoshop and Illustrator to create a cohesive yet distinct design. The project offers an opportunity to explore typography, color theory, and branding, crucial skills for creating both digital and print materials. I will investigate the challenges of translating digital designs into print, addressing issues like color distortion and typography changes that arise in physical production. By using ancestry DNA results as inspiration, I aim to weave personal heritage into the design while still appealing to a broader audience. This project allows for a professional, full-scale branding experience, from concept to production, creating a design-conscious product that balances personal meaning with mass appeal. It's an exploration of how to evoke emotion through visual elements and establish a cohesive brand identity.

## Giants of Another Size

*Richard Lahm '25, English Writing and English Literature*  
*Advisor: Jennifer Jackson*

Throughout the 2010s and mid-2020s, the United States has incubated and subsequently nurtured a uniquely contemporary iteration of apathy, greed, and ontological violence best underscored by the term “corporate fascism”. This neologism not only outlines the current trajectory of a now-readily embraced Western psychology, but also implies the presence of a systemic evil—one which has evolved in parallel beside modern modes of communication, consumption, and authoritarianism to make further apparent the corruption and inversion of present-day morals, ethics, and culture. The first four chapters of a larger novel, this work will explore this post-postmodern human condition through a philosophical consideration of such metaphysical elements as moments and places alongside the introduction of another—“the infinite homogeny”. Through a satirical dissection of four perspectives at varying levels of the same corporate hierarchy, the novel serves as a treatise on “corporate fascism” and the post-2010s society that has allowed it to flourish.

## Subgenres and Cohesive Fragmentation: The Lyric Essay as a Tool to Reclaim Agency after Trauma

*Rebecca Elsen '25, English Literature*  
*Advisor: Rebecca Stafford*

The lyric essay is a subgenre of creative nonfiction known for its experimental style, often featuring fragmented prose, temporal dislocation, and surreality. Because of this, the reader works to weave individual moments together into a broader narrative of interconnected themes. This form is especially useful for writing about trauma, offering a home to stories restricted by conventional rules of style. In my piece, “this home I call my own and other bodily meditations [an assembly in parts],” I explore the complexities of rediscovering oneself after trauma through poetic sequences, etymological and critical theory, and meditations on the body. By integrating a collection of diverse pieces, I illustrate how the lyric essay’s cohesive fragmentation acts as a tool for the writer to reclaim agency and find their voice through writing.

## Our Lives Through Objects: Reclaiming Agency While Honoring Women Who Came Before

*Hannah Pruett '25, English Writing and Organizational Communication*  
*Advisor: Jennifer Jackson*

I research how we use objects to weave family history into our identities and then apply this by writing a creative nonfiction piece titled “The Purse Cycle.” In this work, I challenge the notion that woman must sacrifice their identities for their families. During my transition to adulthood, I encounter reminders of my family’s history through the jewelry, clothes, and purses I wear. As I don objects that my mother and grandmother passed down to me, I experience a mix of empowerment and guilt. I fight to honor my family’s sacrifices, fueled by remorse that I am pursuing a life drastically different from theirs. Through this, I explore how to honor the experiences of women who came before me while preserving agency.



## Marketing, Brand, and Promotion

*Moderator: Jeffrey Anstine*

*Location: WSC 101*

### Student Athlete Advocacy Social Media Accounts: What are They Promoting?

*Hailey Poe '25, Sport Management and Ethical Leadership*

*Advisor: Krystina Sarff*

Social media has developed into an integral marketing tool for sports teams, leagues, coaches, and athletes. While much of the current literature on social media and sports focuses on fan engagement, performance statistics, and using social media to deliver sport news, athlete advocacy has not been as widely explored. This study aims to identify the most prevalent themes student athlete-centered mental health advocacy groups promote on their Instagram accounts. Our study includes a content analysis of five social media accounts in which we have randomly selected eight posts per month from July to October 2024. Our findings suggest that student athlete mental health awareness accounts prioritize content about mental health literacy and athletic performance, amongst other topics, each through their own unique approach. This study has the potential to assist researchers in understanding more about which topics are prevalent in student athlete mental health content.

### From Grrreat to Green: A Comparison of U.S. and Latin American Approaches to the Regulation of Convenience Food Ads Targeting Children

*Jose Gomez Briceno '28, Management and Entrepreneurship*

*Advisor: Casey Gough*

The nourishment we consume as children, before we can distinguish between fiction and reality, can affect our intake as adults. This research investigates how major convenience- food brands target children in an effort to secure a loyal, lifelong customer base. The study examines how branded breakfast cereal, in particular, uses mascots, colors, and strategic advertising to attract young consumers by comparing U.S. regulations with those in Latin America, where some countries face similar health issues. Using a comparative hemispheric framework, I summarize and assess current research on the topic with the intention of evaluating the potential of adapting these marketing strategies to promote healthier food alternatives. My findings demonstrate the consequences of corporate advertising on the young market while also suggesting possible solutions including parental support, consumer awareness, and the promotion of healthier eating habits. Limitations and suggestions for future research are discussed.

### The 2LOVE Brand

*Kathryn Wagner '25, Philosophy and Graphic Design*

*Advisor: Hale Ekinci*

2LOVE is a brand I created through an independent study with Prof. Hale Ekinci. Our goal was to address loneliness in the digital age, particularly among college students. We examined the impact of social media and comparison on mental health and developed a brand specifically tackling these issues. 2LOVE

stands for "to love and to be loved"—a solution rooted in the idea that if we approach each other with love first, the need for social media diminishes. I explored graffiti practices and reactionary art to develop a cohesive visual style, ultimately creating three designs that promote genuine connection. These three designs offer commentary on these topics rooted in research, coupled with my own personal experiences. Being hand screen-printed on thrifted t-shirts, my brand seeks to “tag” those open to conversation while supporting sustainability. Since launching in November, the response has been overwhelmingly positive.

## American Marketing Association Competition

*\*Claira Panos '25, Marketing and Entrepreneurship*

*\*Dylan Becker '25, Business Management*

*\*Vianni Duarte '26, Organizational Communication*

*\*Aiden Healy '26, Marketing and Business Management*

*\*Jadyn Smith '26, Marketing*

*Advisor: Donnavieve Smith*

This research aimed to develop an integrated marketing plan for Adobe Express, a user-friendly design tool catering to college students seeking professional content creation. The study explores market trends, competitive positioning, demographics, psychographics, and consumer perception to examine opportunity for growth. A combination of primary and secondary research was conducted through surveys, focus groups, and competitor analysis to develop a comprehensive understanding of the market. In depth data analysis led to the identification of three key target markets and specific marketing tactics to meet the needs of those segments. The “Express It” campaign consists of event and cause marketing tactics, partnerships, and digital marketing strategies, curated to the needs of individual consumers. Ultimately, the team's recommendations will enhance brand awareness and increase user adoptions amongst the targeted populations, Gen Z and Gen Y. The "Express It" campaign will position Adobe Express as a leading design tool in a dynamic market.

## Transformative Storytelling: Student Roundtable

*Moderator: Sophie Hand*

*Location: WSC 256*

## Transformative Storytelling: Student Roundtable

*\*Elmeka Elme '26, Theatre: Acting*

*\*Mitchell Corbett '28, Crimonology*

*\*Andres Perez Delgadillo '27, Secondary Education and Social Science/History*

*\*Jessica Ramirez '25, Environmental Studies*

*\*Abigaile Phanor '25, Marketing*

*\*Daphne Younge '27, Computer Science*

*\*Juan Espinoza '27, Special Education*

*Advisor: Sophie Hand*

This session marks the second year of the Transformative Storytelling Project at the Rall Symposium. The Project aims to promote inclusivity, a stronger sense of belonging among diverse students, and greater curiosity, understanding, and empathy among the broader college community. During this proposed session, students from diverse backgrounds will share stories about unique experiences that transformed their sense of self, of purpose, of belonging. In doing so, these students demonstrate the courage to be

vulnerable and trust their listeners, while inviting their listeners to trust them. This Project represents a departure from conventional notions of “research,” and acknowledges the many pathways to acquiring and disseminating knowledge. In an era where diversity is becoming a crime, we insist on raising voices that demonstrate our collective humanity. Our student participants have worked with faculty to research and workshop storytelling skills, meeting weekly to hone those skills in preparation for the roundtable.

## Our Immigration Stories: Student Roundtable

*Moderator: Jelena Sánchez*

*Location: WSC 254*

### Our Immigration Stories: Student Roundtable

*\*Amanda Azpeitia '28, Biology*

*\*Juan Espinoza '27, Special Education*

*\*Caroline Huerta '28, Diagnostic Medical Sonography*

*\*Olivia Mattison '28, Exercise Science*

*\*Ashley Quinones '28, Diagnostic Medical Sonography*

*\*Brian Salmeron '25, Health Science*

*\*Jade Serrato '27, Psychology*

*\*Heiry Sierra '28, Criminology*

*Advisor: Jelena Sánchez*

Despite the fundamental role that immigrants play in shaping the United States through their contributions to economic growth, the workforce, and society, immigrants, including those with lawful status, fear arrest, deportation, and anti-immigrant hostility. Many North Central students, children of immigrants, experience lasting effects of their family’s challenging and dangerous journeys oftentimes hidden due to the fear of passing on psychological stress and a negative self-perception. Students’ research in this project aims to recognize their immigration narratives and the transformative impact on their personal identity, values, and perseverance. Through the power of video and oral storytelling of the underrepresented, students find their own voice, opportunity, and sense of belonging. Furthermore, students demonstrate how their family’s journeys connect to broader narratives of immigration, resilience, and heritage preservation. This storytelling collection seeks to foster a deep understanding, connection, and solidarity in our intertwined immigration histories.

## Center for Social Impact: Fellows Roundtable

*Moderators: Suzanne Chod and Eric Shuman*

*Location: WSC 042*

### Creating a Safe-Space: Theatre as an Act of Inclusion for Elementary Students

*Jake Keller '26, Musical Theatre and Theatre: Directing and Dramaturgy*

*Advisors: Suzanne Chod and Eric Shuman*

In any learning environment, a sense of inclusion and belonging is vital to ensuring a prosperous future; primary education is a catalyst for modeling these values for students. That said, those in underserved elementary communities are not set up for success. Students of lower socioeconomic status are

disproportionately likely to have a lower sense of belonging in the classroom than their higher-status counterparts. This is especially relevant within public schools of the Chicagoland area. The arts have always given a unique means of expression that other academic forms fail to provide. Moreover, observing and partaking in theatrical arts is inarguably the strongest form of communication towards building community. These underserved communities, however, often lack means to provide comprehensive arts education. Through examining local contexts towards bringing theatre to underserved students, this research seeks to reveal the immense importance of elementary theatrical education and provide suggestions of supportive resource initiatives.

## Growing Our Community: How a Community Garden Can Serve as a Third Place for North Central College and Naperville

*Margaret Sizemore '25, Mathematics*

*Advisors: Suzanne Chod and Eric Shuman*

North Central College lacks third places on its campus, especially those that foster connections between students and members of the local community. The College may explore the establishment of an additional dining/activities center, the construction of a makerspace, the development of more outdoor gathering areas, or the renovation of current spaces to convert them into third places. While these are all viable options, based on the research completed through a literature analysis and community listening sessions, the solution that best addresses the College's needs would be the construction of a new campus garden. The former campus garden was converted into a tree nursery, but it was the only space on campus that actively and continuously invited community members to utilize the space alongside the College's students. This would ideally be constructed on the College's Riverfront Property with plots for campus, student, and community use, along with ample seating.

## Pandemic Fallout: Student and Community Belonging at NCC in the Shadow of Covid-19

*Abigail Black '25, Political Science and Sociology*

*Advisors: Suzanne Chod and Eric Shuman*

The Covid-19 pandemic upended the academic experience of students of all ages, from elementary school to post-graduate. Now, students who spent most of their high school years under the shadow of Covid are entering college. While media and similar organizations have discussed the impact of Covid on schooling and learning, the long-term effects of Covid on college and on the transition from high school to college has been under-explored in the United States as compared to countries such as Germany, Canada, and Indonesia. Using data on event attendance and club participation, and by providing spaces for listening sessions, the consequences of the pandemic and struggles with campus student engagement and motivation are probed. The results are then used to suggest a transformation of physical space to ensure a welcoming environment to foster connection and discussion, as well as additional support structures to enhance access to the community.

## Reading Country: Supporting Access to Public Libraries in Rural Communities

*Aaliyah McCormick '26, Political Science*  
*Advisors: Suzanne Chod and Eric Shuman*

Rural libraries across the country are pillars of their communities, offering vital informational services to those with limited access to books and online resources. These libraries subsist on significantly less funding than their suburban counterparts and rely far more on grants from state and federal governments, making them more vulnerable to changes in the political climate that reduce library funding. Lower funding results in fewer staff members with less advanced training, as well as reduced access to library services for those who are unable to visit the library in person—an issue more problematic in these rural areas that lack public transportation. I propose a partnership program between Mount Carroll District Library in Mount Carroll, IL and North Central College's Oesterle Library with the goal of improving training for staff and creating greater access to library resources for the community.

## Bridging the Gap: The Path Toward Naperville's Climate Action Plan

*Roselynn Orrala '28, Environmental Business and Economics*  
*Advisors: Suzanne Chod and Eric Shuman*

In 2021, the City of Naperville adopted its Sustainability Work Plan, a collaborative effort between city staff and the Naperville Environment and Sustainability Task Force (NEST), designed for later use to formulate a Climate Action Plan (CAP). Despite the communities' continued desire to prioritize renewable energy sources (RES), Naperville has yet to implement a CAP. In my research, I explore the barriers between NEST and the local government by analyzing both parties' hesitations to collaborate and move forward with the development of a CAP. I then examine suburbs similar to Naperville in population size and age that were successful in collaborating between community partners and the government in the development of their CAP. I find that through continuous collaboration, the local government and NEST can reach an agreement to create and adopt a CAP, bringing the two parties back into alignment.

## Poster Session II: 11:10 a.m. – 12 p.m.

*Stevenson Hall*

## Two-Faced: Mental Health Reflected, A Visual Representation of Anxiety Through Technology

*Andjela Kesar '25, Interactive Media Studies: Technology*  
*Advisor: David Cordero*

Art can be defined in countless ways, and I believe art is a powerful form of creativity that communicates meaning or expression, whether direct or subtle. My thesis project merges art and technology to raise mental health awareness. As research into mental health issues grows and garners more attention, it's clear that these challenges affect tens of millions of people worldwide. My focus is on 18 to 25-year-olds,

the demographic most impacted by severe mental health conditions. In this project, video serves as a medium that fosters social connection, creating a shared space for understanding. The video acts as a public service announcement about mental health. The two-way mirror reflects the viewer, allowing them to engage with the video's message while also seeing themselves in it. The immersive environment invites the viewer to explore the complexities of mental health, its emotional toll, and potential solutions for support and healing.

## Cardinal Lens: Raising Environmental Awareness Through Photography

*Kristina Kesar '25, Environmental Studies*  
*Advisor: Christine Rabenold*

Environmental awareness can be raised through photography, a leading communication tool used to highly contemplate humanity's environmental impact and evoke emotional responses. Early efforts to photograph the environment and natural world inadvertently sparked activism, such as Charleton Watkins' everyday photos of Yosemite, which played a key role in establishing Yosemite Valley as the first federally protected wilderness area. Environmental photo contests held globally allow people to showcase their talent and promote environmental consciousness. Due to North Central College's lack of such programs, my project aimed to create the first annual environmental photography contest at the institution, officially titled Cardinal Lens. I developed a website, social media presence, submission form, and evaluation rubric, ultimately gathering thirty-one submissions and awarding three prizes. These were then showcased in a photography exhibition that captured the campus community's reactions and thoughts.

## Why Do People Consume Cannabis?

*Daphne Kolody '25, Psychology*  
*Advisor: Mary Jean Lynch*

Cannabis is slowly gaining notoriety for its therapeutic applications regarding mental health symptoms (such as anxiety, insomnia, depression, mania, episodic PTSD) and physical health conditions (such as insomnia, chronic pain, neuropathy). Prior research suggests that cannabis consumption may be a valuable tool for those who do not respond well to traditional therapeutic modalities. This mixed-methods study explored the reasons why cannabis agents ("budtenders") and customers of a cannabis dispensary company use cannabis and prescription medications. A QR code linked to a Qualtrics questionnaire was sent to the company's internal email list of budtenders and posted to the company's social media page and in-store community bulletin boards. Preliminary results (n=42) suggest that both budtenders and customers use cannabis for insomnia and anxiety relief, and prefer its usage over certain prescription drugs, but not as a replacement. There were no differences between their reports.

## Further Understanding the Role of Bzz1 during Clathrin-Mediated Endocytosis

*Abby MacKenzie '25, Biology*  
*Advisor: Steve Johnston*

In clathrin-mediated endocytosis, actin polymerization is an important step for invagination. In yeast, many different proteins play a role in actin polymerization. Las17 is a nucleating promoting factor that



activates Arp 2/3 through its actin-binding sites. Another protein, Sla1, binds to the Las17 actin-binding site and prevents actin polymerization. In previous experiments, the Di Pietro Lab has found that the protein, Bzz1, is releasing Sla1 from the actin-binding site of Las17. Through fluorescence microscopy, we investigated how mutating the actin and Bzz1 binding sites of Las17 affect endocytosis in yeast. Fluorescence microscopy demonstrated that mutating the Bzz1 and actin-binding site of Las17 leads to fewer endocytic sites per cell and a lower intensity at those sites. Further investigation, such as in vitro assays, must be done to establish a clear hypothesis on how Bzz1 affects actin polymerization.

## Effects of Temperature in *Gryllodes sigillatus* Mating Behavior

*\*Maisha Marzan '25, Biology and Applied Mathematics*

*Anthony Flores '25, Biology*

*Rebecca Grecco '25, Biology*

*Advisor: Chandreyee Mitra*

Temperature fluctuations greatly affect the physiological and behavioral responses of ectothermic organisms, especially in insects. With climate change becoming a pressing issue, understanding how temperature changes affect these organisms and how they adapt to them is crucial. For this study we use *Gryllodes sigillatus* as a model organism to study the effect of temperature. Our objective was to understand how varying levels of temperature (30°C and 35°C) on adult male and female crickets can affect their mating behavior. We compared the time taken to start mating to determine responsiveness, spermatophore size, and spermatophylax size in the crickets reared in both temperatures. Our results suggest that after accounting for the female cricket's age, rearing temperature significantly influences the time taken to start mating, that is responsiveness. The rearing temperatures for the male and female crickets and their interaction did not have significant effect on the spermatophore or spermatophylax sizes.

## Using FRET Microscopy to Compare the Binding Affinity of Various PLM Mutants to the NKA Pump

*\*Alexis Mazzenga '25, Exercise Science*

*Seth Robia (Loyola University Chicago)*

*Advisor: Marilyn Skarbek*

Dilated cardiomyopathy causes decreases in contractility from thinned ventricular walls. This project prevents calcium, an ion involved in muscle contraction, from moving out of the cell to increase contractility. Investigation of the sodium-potassium (NKA) pump, a protein that moves ions across cell membranes, was done to analyze its effect on calcium movement. As ions move, electrical charges change, influencing calcium to exit the cell. Inhibiting the pump prevents the movement of calcium, allowing it to aid in contraction. Phospholemman (PLM) has previously been shown to inhibit NKA function and was utilized in the samples. Assessment of the tightness of PLM-NKA binding allows inferences of NKA inhibition to be made. The binding affinity is assessed by fluorescently tagging proteins to quantify binding using fluorescence resonance energy transfer (FRET) microscopy. Two of nine mutations of PLM significantly inhibited NKA, which may be used to increase contractility of dilated cardiomyopathic hearts.

## Neurocognitive Deficits and the Risk for ACL Injury

*Luis Moreno '26, Masters of Athletic Training  
Advisor: Kendall Selsky*

Anterior cruciate ligament (ACL) injuries extend beyond musculoskeletal trauma. Viewing ACL injuries as neural lesions that result in neurocognitive and neurophysiological impairments can improve patient outcomes. Integrating neurocognitive training into rehabilitation may help reduce ACL injury in athletes with neurocognitive deficits. To explore this topic further, a critical review of two cross-sectional studies and a case series (n= 113 participants) was conducted. Findings reveal that participants with ACL reconstruction (ACL-R) exhibited significantly lower reaction time ( $p = .02$ ) and processing speed ( $p = .01$ ) compared to controls. Unfavorable knee biomechanics correlated with cognitive function deficits in the ACLR group ( $p < .05$ ). Dual-task assessments indicated decreased visuomotor reaction time in the ACLR limb ( $P = 0.10$ ;  $n2 = 0.250$ ). Results of this critical appraisal imply that perception-action coupling may be impaired following ACL-R due to neuroplasticity alterations, increasing ACL injury risk, and should be addressed through neurocognitive training during rehabilitation.

## Developing Intermuscular Coherence and Clustering Index as Features for Machine Learning Models of ALS

*Avinash Moses '24, Molecular Neuroscience  
Advisor: Naoum Issa (University of Chicago)*

Amyotrophic Lateral Sclerosis (ALS) is a debilitating and life-threatening neuromuscular disease for which early diagnosis is crucial to improve prognosis. However, the heterogeneity of ALS symptoms makes this difficult. Machine learning has emerged as a promising tool for development of diagnostic tools using surface electromyography (sEMG), a non-invasive measure of muscle activity. We developed and validated scalable Python software for feature extraction, computing clinically validated sEMG-based biomarkers – intermuscular coherence (IMC) and clustering index (CI) – alongside other statistical features associated with neuromuscular abnormalities. IMC alone achieved an area under the receiver operating characteristic (ROC) curve of 0.70-0.75, indicating fair ability to distinguish patients with various neuromuscular abnormalities (including ALS) from neurotypical subjects. We will next use all extracted features in combination to train, test, and compare different ALS diagnostic models using ensemble machine learning algorithms as well as deep learning for feature-agnostic modeling.

## Effects of Diet Quality and Quantity on Mating Behaviors in Male *G. sigillatus* Crickets

*\*Zach Mottlow '25, Biology  
Bailey Lomahan '25, Environmental Science  
Advisor: Chandreyee Mitra*

Given the worldwide decrease in insect populations as a result of changing environmental conditions, such as nutrient availability, we investigated the effects of altering male diet quantity and quality on various traits and mating behaviors using *Gryllodes sigillatus*, also known as the tropical house cricket. More specifically, we measured the average time taken to initially mate, the time the female left the ampulla remaining attached to her, as well as the time the female spent eating the nuptial gift and the

estimated proportion of the nuptial gift eaten. We found that with our quality trials, diet quantity had a significant effect on time to mate, however, diet quality and quantity did not significantly affect any of our other variables, which indicates that *G. sigillatus* may be capable of acclimating effectively to changes in nutrient availability.

## Observing Dose-Dependent Attenuation of Oxytocin in the Cocaine-Seeking Behavior of Differentially Reared Rats

*\*Trinity Murray '26, Molecular Neuroscience*

*\*Stephanie Sherrod '24, Psychology and Molecular Neuroscience*

*\*Elizabeth Norman '25, Psychology and Behavioral Neuroscience*

*Holly Helmers '26, Biomedical Sciences*

*Miranda "Lily" Baker '26, Molecular Neuroscience*

*Advisor: Margaret Gill*

Various environmental and genetic factors during childhood can impact susceptibility to drug dependence later in life. Altering environmental rearing conditions early on in rodent neurodevelopment alters future susceptibility, as rearing rats in enriched conditions attenuates drug-seeking behavior compared to impoverished rearing. The current study investigated whether this enrichment-induced protective effect is modulated by oxytocin administration. Male Sprague-Dawley rats were reared into enriched (EC), social (SC), or impoverished (IC) conditions. Rodents underwent the cocaine-self administration paradigm, which was split into three phases: cocaine self-administration, extinction, and cue-induced reinstatement paired with oxytocin or saline injections. A dose-dependent effect of rearing was observed during cue-induced reinstatement, in which oxytocin attenuated cocaine-seeking in SC rats at low (0.3 mg/kg) doses, and IC rats at moderate (1.0 mg/kg) doses. These findings suggest that oxytocin could serve as a pharmacological therapy to alleviate socioeconomic-induced vulnerabilities to drug dependence.

## In Physically Active Individuals that Have Sustained a Concussion, Does Vestibular Rehabilitation Therapy Improve Recovery Time?

*Kellyann O'Neil '26, Masters of Athletic Training*

*Advisor: Taeopae Wetterman*

Vestibular therapy has been shown to improve the return to play time in athletes diagnosed with a concussion. Vestibular therapy focuses on balance and coordination, which are common vestibular dysfunctions following a sports-related concussions. Research has shown that early intervention with vestibular therapy reduces symptoms allowing for a quicker recovery time and reduction of self-reported symptoms. These studies show that athletes who were treated with vestibular therapy had a reduced recovery timeframe. When cervical therapy was used in combination with vestibular therapy, athletes saw a decreased recovery timeframe compared to vestibular therapy alone. Appraising one systematic review using the PRIMSA was 22/27 deeming is a high level of evidence. Appraising two retrospective cohort studies received a 16/22 and 18/22 using the STROBE scale for moderate evidence. Adding vestibular therapy into sports-related concussion treatment results in a quicker resolution self-reported symptoms and recovery timeframe that is important in athlete concussion management.

## Effects of Static Stretching and Dynamic Stretching Relating to Muscle Stiffness

*Harsh Patel '26, Masters of Athletic Training*  
*Advisor: Scott Ellis*

Stretching is commonly practiced within active individuals for reducing muscle stiffness at many levels of athletics. This critically appraised topic (CAT) aims to answer the question of whether stretching decreases stiffness. 3 randomized controlled trials were selected based on the established inclusion and exclusion criteria. The articles received a CEBM of 2 and 6/10 PEDro, 2 and 5/10 PEDro, and 8/10 PEDro. Based on this CAT, the clinical bottom line is that there is evidence suggesting that stretching decreases stiffness. 2 studies have shown decrease in muscle stiffness. One study has shown a decrease in muscle stiffness by 18%-33% (in millimeters), and the other study showed a decrease in muscle stiffness by 10%-13% (newton meter per degree). It is important to know if an active individual can benefit from stretching before participating in physical activity, there are few complications to stretching, and can help reduce muscle stiffness.

## Fruits of My Labor: Writing, Illustrating, and Designing a Picture Book About Creativity and Burnout

*Andrea Peguero Gonzalez '25, Studio Art*  
*Advisor: Hale Ekinci*

At a time where breaking into the creative industry seems like a daunting task, a picture book serving as a reminder to believe in one's artistic voice can offer a feeling of comfort to a young maker. Expressing the bumpy yet exhilarating experience of creative work through whimsical allegory, *Ada and the Lemon Tree* follows the struggles of Ada, a mythical being born of a lemon seed with a single task: to care for the growth of her lemon tree. Through expressive lines and layered mark-making coupled with digital editing and formatting tools, the book contrasts traditional Western fairytale imagery with contemporary color and design. Using both visual and verbal storytelling techniques, the product portrays the ups and downs of creative work in a world of spectators and makers alike, and seeks to encourage young adult artists to have faith in who they are and what they can create.

## From Marriage to Motherhood: Nazi Policies on Women, 1938-1945

*Victoria Robinson '26, Social Science/History and Secondary Education*  
*Advisor: Shereen Ilahi*

My research focuses on women in Nazi Germany and how the regime tried to control their lives. The Nazi's attempted to control German women's bodies by regulating who they could marry and by using propaganda to stigmatize women who resisted their control. I analyze the "Marriage with Foreigner's Act" passed in 1941, which stated that German women could strictly marry German men, however there were no such regulations against German men. I also examine loans given to "pure" German families for having multiple "Aryan" children to help with additional costs such as housing, food, and school. I analyze primary sources, written in German but translated into English, such as newspapers and art exhibitions from the 1930s and 1940s. My findings show that German women were the only people charged with the burden of keeping the race "pure," and they were only considered "useful" to society if they had multiple "Aryan" children.

## The Role of Religious Leaders in Navigating Trauma

*Mia Rogers '25, Psychology and Shimer: Humanities*  
*Advisor: Nicole Rivera*

Posttraumatic Growth (PTG), the process of experiencing positive outcomes after trauma, is significantly associated with religious faith. Given trauma's prevalence, understanding how to promote the occurrence of PTG after an aversive event is crucial. In times of crisis, members of a religion are likely to turn to their faith leader(s) as the first person they seek for guidance. The present study explored how leaders of various faiths help their community members navigate traumatic events. Hour-long interviews were conducted with religious leaders, exploring how they helped community members navigate hardship through the lens of faith. Data were coded and analyzed for emergent themes. Analysis revealed three key ways these leaders assist during trauma: help reframe the experience through the lens of faith, provide a safe space and emotional support, and suggest faith-based coping mechanisms. These findings suggest religious leaders' guidance may promote PTG following significant hardship.

## Interpretations of "Sin" and How It Is Used to Control Female Bodies

*Megan Sinnaeve '26, Sociology*  
*Advisor: Raleigh Blasdel*

The institutionalization of Christianity has shaped patriarchal views of women, particularly through figures like Eve and Mary Magdalene—cast as either morally righteous or corrupt. After reviewing key secondary scholarship on Biblical interpretations of women, it was concluded that these interpretations have had a significant influence on societal control over female bodies. Eve and Magdalene have come to symbolize inherent womanhood, forcing women to prove their moral goodness. Thus, many women are socialized to equate moral purity with body aesthetics, adhering to ideals of restraint to avoid social ostracism. This cultural dualism reduces human complexity, as fear of moral judgment pushes women toward conformity and internalized oppression. This research revealed how deeply embedded ethical codes operate subconsciously, making them challenging to escape. Understanding these systems is crucial and requires analyzing the historical forces that have shaped collective and individual moral frameworks over time.

## Biochemical Identification of MyosinVIIA Binding Partners

*Kate Taylor '26, Biology*  
*Advisor: Jennifer Sallee*

ck/MyosinVIIA is a motor protein that is necessary for the formation of actin-based protrusions such as wing hairs, bristles, and denticles in *Drosophila melanogaster*. ck/MyosinVIIA is believed to carry proteins within these structures, however the identities of its cargo proteins are currently unknown. A potential protein binding partner is shavenoid, a protein that interacts with the actin cytoskeleton in bristles and hairs. We generated a transgenic fly containing both an affinity-tagged ck/MyosinVIIA tail and GFP-shavenoid construct. To test for protein interactions between the two, we lysed the flies and performed an affinity-tag protein pulldown for the ck/MyosinVIIA tail and blotted for GFP-shavenoid. Current buffer conditions limited the solubility of the ck-tail construct and we were not able to isolate it. This prevented us from being able to determine if GFP-shavenoid binds to ck/MyosinVIIA. Future directions aim to improve solubility of ck/MyosinVIIA and repeat the pulldown assay for protein interactions.

## Ketamine's Effects on the Dentate Gyrus and Ventral Subiculum C-Fos Activity during Oxycodone Incubation of Drug Seeking

*\*Lukasz Teper '26, Behavioral Neuroscience*  
*Stephanie Sherrod '24, Molecular Neuroscience and Psychology*  
*Marjia Angelovska '24, Molecular Neuroscience*  
*Ari Watts '26, Molecular Neuroscience*  
*Natalie Falco '26, Molecular Neuroscience*  
*Advisor: Micheal T. Stefanik*

The opioid epidemic highlights the need for effective addiction treatments. Many drugs show a time-dependent increase in cue-driven drug seeking during following abstinence ("incubation"). Hippocampal subregions like the dentate gyrus and ventral subiculum are key players in learning and contribute to drug seeking via connections to the reward circuits. We hypothesized that increased activity in these regions (measured by the presence of the neuronal activity marker C-Fos) contributes to incubated oxycodone seeking, similar to other drugs. To test this, rats self-administered oxycodone (0.15mg/kg/infusion/10 days), followed by forced abstinence. Results showed increased lever pressing in oxycodone rats during drug seeking WD15. Next, we administered daily ketamine, an NMDA-receptor antagonist used in the treatment of in substance use disorders, daily during withdrawal (0.6mg/kg; i.p.) and tested its effects on drug seeking and hippocampal activity. We hypothesized ketamine would decrease oxycodone seeking and C-Fos after incubation. Surprisingly, no differences were observed.

## Children's Museums and Communities

*\*Teresa Chew '26, Psychology and Philosophy*  
*\*Adeline Salgado '25, Psychology*  
*Deisy Perez '26, Behavioral Neuroscience*  
*Courtney Ryan '26, Psychology*  
*Advisor: Nicole Rivera*

Children's museums help to facilitate high quality learning experiences for young children and their families. Through on-site and community programming, children's museums help children build resilience and well-being. Children's museums provide programs such as after school education, arts and STEM based learning, caregiver support, health and wellness activities. The present study investigates the role children's museums obtain within their communities. To explore this, researchers completed interviews with staff members involved with community programming at ten museums in the United States and a review of the organization's websites. Data was coded for descriptive data about the work that museums are doing within their communities. Findings indicate that children's museums work with multiple community partners to address education, health, and social needs in their communities. This is important because children's museums play a significant role in the ecosystem of care for both young children and their families.



## Mythbusting: Journaling to Debunk Psychology Misconceptions and Explore Social Circles' Beliefs

*\*Colette Tozier '26, Psychology*

*Mia Rogers '25, Psychology and Shimer: Humanities*

*Natalie Peters '24, Psychology*

*Advisor: Marissa Bamberger*

Introductory psychology students (N=83) participated in a quasi-experiment in which they completed journals examining psychological misconceptions in their lives (experimental condition) or applying psychology concepts to their lives (control condition). This study examined the journals' effect on students' conceptual change and the relationship between students' conceptual change and their social circles' misconception endorsement. The results suggest, overall, that the journal intervention elicited marginal conceptual change of students' misconception beliefs. Specifically examining the five most frequently debunked categories of misconceptions, students experienced conceptual change for brain-and-behavior and memory misconceptions but not for consciousness, emotion-and-motivation, and social-psychology misconceptions. Also, overall (and for the emotion-and-motivation misconceptions specifically), as students' social circles endorsed misconceptions less, students' experienced greater improved change in their own misconception endorsement. Therefore, debunking misconceptions via journal assignments may elicit conceptual change for some misconceptions more than others. However, students' social circles' misconception endorsement might relate to this effect.

## Refuse to Lose: The Legacy of John Thorne

*Eduardo Valdes '27, Social Science/History and Secondary Education*

*Advisor: Shereen Ilahi*

North Central College's football program lacked sustained success before John Thorne took over as head coach in 2002. My research examines how Thorne's leadership transformed the program into a national championship contender. While previous historical records document the team's struggles, little research has analyzed the cultural and structural changes that led to its turnaround. This study fills that gap by applying primary source analysis and archival research, including interviews with current head coach Brad Spencer, North Central Chronicle articles reviews, institutional records from the North Central Athletics website, and insights from the 150 Years book. My findings reveal that Thorne's "Refuse to Lose" philosophy instilled accountability, discipline, and a winning mindset, laying the foundation for long-term success. This research highlights the significance of leadership in athletic programs, demonstrating how Thorne's approach revitalized North Central football and established a legacy that continues today.

## Three COX10 Point Mutations, Potentially Associated with Leigh Syndrome in Humans, Are Partially Functional at Low Expression Levels in *Saccharomyces Cerevisiae*

*\*Amber Vande Hei '25, Biomedical Science*

*\*Kyla Border '25, Biomedical Science*

*Advisor: Steve Johnston*

Mitochondria malfunction leads to a variety of detrimental or severe symptoms that have been later characterized as mitochondrial dysfunction diseases. Of these diseases, Leigh syndrome is a rare

neuromuscular disease sometimes attributed to mutations in COX10, hindering the oxidative phosphorylation process. Previous research has identified COX10 mutations potentially associated with Leigh syndrome, showing proper cytochrome C oxidase (COX) function at high expression levels. This research investigates whether three of these mutations, V356M, D142Y, and F209L, are functional at low expression levels in a *Saccharomyces cerevisiae* model system. We find that these COX10 variants fail to grow on nonfermentable media and demonstrate low levels of COX enzyme activity, suggesting that these variants are largely nonfunctional at low expression levels. Further research is necessary to address the discrepancies in COX10 function at high and low expression levels. Such information could lead to translation and implications of Leigh syndrome in humans.

## Decolonizing the Arab Revolt: Arab Agency in a British-Dominated Narrative

*Cristian Walsh '26, History*  
*Advisor: Shereen Ilahi*

My research on the Arab Revolt (1916–1918) challenges the notion that British support was crucial to Arab successes. Arab leadership, including Sherif Hussein of Mecca and his sons Faisal and Ali, led key victories independently, both before and during British involvement. I use the historical method, analyzing Primary sources from T.E Lawrence and Arab leadership. I argue that while British resources aided the revolt, the majority of fighters were Arab, following Arab command. The revolt began planning as early as 1914, as Hussain worked on garnering support. Although the British began sending officers in June 1916, Hashemite forces and leadership controlled many of their battles. Popular narratives, like Lawrence of Arabia, depict the revolt as British-led, but my findings reveal that Arab leaders played the decisive role.

## Dark Matter Detection Simulation for MAGIS-100

*Nicholas White '26, Mathematics and Physics*  
*Advisor: Mandy Kiburg*

MAGIS-100 is a current experiment being constructed at the Fermilab National Laboratory in hopes to study dark matter effects on particles. Our research goal was to construct a system to simulate how dark matter effects would take place within the experiment. Using a Python package, SymPy, we constructed a differential equation solver that takes an input equation and gives the equations of motion that can be solved to predict future paths of the particles under dark matter effects. More work on this project is being done, but early tests of simple, already solved, physical systems, have achieved the proper behavior one would expect, e.g., a pendulum or block sliding down a ramp.

## Case Study: The Coffee Lab Sustainability Report

*Abigail Black '25, Political Science and Sociology*  
*Advisor: Esen Andiç-Mortan*

Utilizing a semi-hierarchical model, this project conceptualized and created an evaluation study of the Coffee Lab's sustainability processes. Sustainability performance measurement in the non-profit sector is under-researched and exploring the sector through an organization such as the Coffee Lab provides valuable insight into non-profit sustainability practices. This case study also provides a pilot and blueprint for future regular evaluations of the program while also creating a benchmark to inform

operational development. Metrics of evaluation were tailored to ensure their practicality and application to Coffee Lab operations and mission. These metrics were added to a survey that was used to create a weighted value for each metric and metric grouping. The sustainability performance measurement framework that is being built holds the potential to set an example for other organizations that have a social mission, especially those involved in the intersecting sustainable elements of the coffee supply chain.