

# ILLINOIS COLLEGE CELEBRATION OF EXCELLENCE

## ABSTRACTS

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# CELEBRATION OF EXCELLENCE 2025

## Abstracts

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### DIVISION I :: ORAL PRESENTATIONS

#### **Mental Illness, Commodity Fetishism, and Cannibalistic Fanfiction: An English Senior Capstone Symposium**

**Olivia Joy, Reilly Nelson, Abby Cantrell**

*Faculty Sponsor: Beth Capo*

Mental health representation in fiction progresses when brave individuals are vocal about their experiences with stereotyping, acceptance, and treatment of a mental disorder. While society has made leaps in including protagonists with mental disorders, readers cannot understand mental disorders comprehensively unless they consider the character's environment. By evaluating character interaction in neurodivergent stories by John Green, Olivie Blake, and Tamara Ireland Stone, this paper argues that, to achieve comprehensive mental health representation in realistic fiction, readers and scholars must consider secondary characters' reactions to a protagonist's mental illness, and how those reactions impact the presentation and progression (or regression) of the mental illness.

Much of the popular research surrounding science fiction today analyzes posthumanism what-ifs: what if humanity meets alien lifeforms, what if humanity is in space wartime, what if humanity no longer exists? Before this, scholars often applied a socialist ideology to understand humanity's role in the globalized (or, in science fiction's case, universalized) economy and government. In Hannu Rajaniemi's *The Quantum Thief* (2010), readers experience the dangers of surveillance culture and oligarchy control in an economy where exchanging hours of one's life can provide anything. In discussing Philip K. Dick's *Do Androids Dream of Electric Sheep?* (1968), many scholars focus on the "human" and emotions yet ignore Dick's critique of capitalism and warning to a materialist society. In this timely presentation, a classic Marxist lens is used to analyze these texts for commodity fetishism and alienation, and the what-if of humanity growing apathetic in today's increasingly consumerist culture.

This presentation explores how fandom, more specifically fanfiction (creative work featuring elements from a pre-existing work of fiction), creates a sense of ontological security in its participants. There are over 10 million different fanfictions on sites such as Archive of our Own, but this presentation will be analyzing *Pork Belly Burnt Ends*, a fanfiction written by A\_Dude\_Named\_Mom and OctagonsRule in 2022, and the online community that has formed around the story. An existentialist lens will be applied to the story to analyze its warning against abandoning moral responsibility in order to achieve complete authenticity. Previous research agrees that people have found belonging and comfort in fandom spaces, but the focus on larger fandoms such as *Star Trek* creates the idea that a fandom has to be large and have existed for many years in order to have such an impact. The interviews conducted for this presentation show that a similar comfort can be found on smaller scales in lesser known fandoms as long as that passion for the source material and fanworks exists. During a time of great social instability, fandom may be a way for some people to find ontological security by bonding with others through shared interests, no matter how niche.

#### **Northern Ireland in Focus**

**Kayla Piper**

*Faculty Sponsor: Alex Moore*

IC Study Abroad provides students with the opportunity to learn and explore new cultures and perspectives. During my study abroad experience in Northern Ireland (NI) I explored the country through the lens of my camera. My camera captured landscapes, people, events, and daily life that tourists might not always see. From some of my first moments at Giants Causeway, the streets of Belfast and Derry, and to my final project capturing motorbikes in Coleraine, my camera allowed me to capture an inside glimpse of NI. This project is a photo gallery that showcases many of my moments while studying abroad through a visual narrative. My aim with this gallery is to highlight history, culture, and personal exploration while in NI. Visual arts can tell stories, create connections, and evoke emotion, making it an ideal medium for sharing the impact of studying abroad. By presenting this gallery to students at Illinois College, I hope to inspire them to consider studying abroad, to step out of their comfort zone, and experience diverse cultures outside of the US. This exhibit reflects on not only my experience, but also the role of photography and how it preserves moments in time. My ultimate goal is to create a deeper appreciation for studying abroad and artistic expression. My gallery includes 20-30 professional photographs as well as two high-quality videos from my library that highlight various aspects of NI. It also includes personal touches, such as polaroids and trinkets that I collected during my time abroad. Although this exhibit could stand alone and speak for itself, I elaborate on my experiences to give them further context in an accompanying presentation.



### **IC's Literary Journal, Forte, Presents Poetry Out Loud!**

**Serenity Vasquez, Olivia Joy, Zach Steinkamp, Reilly Nelson, Abby Cantrell, Kate Phillips, Asia Madkins, Thorne Morgan, Chuck Brink, Danielle Simpson**

*Faculty Sponsor: Kara Dorris*

Illinois College's literary journal, Forte, is run by IC students to showcase the creative writing of IC students and alumni. In this session, Dr. Kara Dorris will introduce the editors and selected student contributors. Then editors and contributors will read original poetry as well as sharing the inspiration, meanings, and stories behind their work.

### **Fall: An Original Composition for Flute and Piano by Danielle Simpson**

**Danielle Simpson**

*Faculty Sponsor: Christian Secrist*

In this presentation, I am excited to share two distinct instrumental pieces that showcase the versatility and richness of musical arrangements. The first piece, entitled "Fall," is an original composition for a flute and piano duet. This composition blends the tones of the flute with the resonant harmonies of the piano to create a dialogue that explores the fall season. The duet attempts to capture the essence of both instruments, highlighting their individual characteristics while creating a cohesive and captivating musical conversation.

The second piece is a Sea Shanty Medley arrangement, which combines four traditional maritime work songs. This arrangement tries to preserve the authentic spirit and historical significance of these songs while presenting them in a cohesive medley format. By carefully combining several well-known shanties, the arrangement maintains their rhythmic drive and melodic charm, allowing listeners to experience the timeless essence of these songs. This medley aims to celebrate the heritage and cultural importance of sea shanties, bringing their enduring legacy to the audience.

### **2+1: Musical Resourcefulness in Small Communities**

**Lillian Deter**

*Faculty Sponsor: Tyler Carpenter*

Most musicians are responsible for providing and transporting only one or two instruments. However, percussionists must have knowledge that extends to dozens of instruments. This provides a unique challenge and interesting opportunities for music education. However, percussion equipment can be prohibitively expensive. These constraints can be especially felt in small communities where access to music education is limited. To overcome these limitations, many percussion composers have composed pieces for unconventional instruments and/or playing techniques. I will discuss minimalism using Steve Reich's "Clapping Music," body percussion with William J. Shinstine's "Rock Trap," and unconventional techniques with Ivan Trevino's duet, "2+1." This presentation will culminate with a live performance of "2+1."

## DIVISION I :: POSTERS

### **Protest Poetics in Practice: A Poetry Workshop**

**Olivia Joy, Serenity Vasquez, Emily Vlach, Taylor Henry, Zach Steinkamp**

*Faculty Sponsor: Kara Dorris*

Ever wanted to know what goes on in a poetry workshop? EN 305: Advanced Poetry Workshop students have come together to share their poems and poetry chapbooks with the IC community beyond the classroom. These students will share original work and discuss writing poetry as well as what they've learned through studying poetry.

### **Diversity Audit: Reflections of Local Community in Library Collections**

**Claire Peters**

*Faculty Sponsor: McKenna Jacquement*

Since 2020, libraries have faced a growing number of challenges against books, which disproportionately target underrepresented populations, such as people of color and members of the LGBTQ community. Despite the challenges, libraries must maintain the responsibility of ensuring accessibility to diversity through the experience of reading. Auditing Schewe Library's collections allows us to analyze how diversity appears within its walls when compared to the populations of Illinois College, Morgan County, and Illinois. The audit collected data on authors regarding their race, ethnicity, gender, and sexuality, using author-reported data available in the book or through online research. The data showed an underrepresentation of all minority groups included in the study within Schewe Library's collection against the compared populations. Schewe's librarians will be able to use this data for future weeding and acquisition of books to better represent the diversity of the local populations. A focus on authors of racial minorities, the LGBTQ community, and Hispanic/Latinx authors should be considered during these processes to better align the library's collections with its patrons.

### **Ecuador's Heart is Bleeding: Chainsaws and Drills Rip Through Nature**

**MacKenzie Jones**

*Faculty Sponsor: Steven Gardner*

Over half of Ecuador's geography is flourishing in life and diverse organisms-or so it was. Human kind, for the past three decades, has been suffocating the wildlife of Ecuador with oil, toxic waste, chainsaws, and death pits. Ecuador has been turned into an ecological genocide at the hands of human desire. If keystone species in Ecuador, such as the Galapagos giant tortoise, Andean spectacled bear, or South American tapir continue to fall victim to the actions of humans-the whole ecosystem will collapse. Economic devastation will follow, as Ecuador's main source of income is its agriculture. Ecuador's unique and acidic soil makes the lands perfect for a vast amount of agriculture such as coffee, cacao, bananas, and more. These agricultural products are culturally significant to the people of Ecuador, and are a lifeline to the economy. If these soils are destroyed, the economic service value of Ecuador plummets, followed by the economy, along with the culture and connection between the people and the world. People will go hungry, animals will die, culture will be destroyed, and the economy will collapse. The problem lies in the economy and the government's drive for money and providing to the high supply demand. In order to save the wildlife and advocate for the people of Ecuador and their culture, humans must recognize the issue in destroying the rainforest before it is too late, as the drive for money is the deadliest weapon of all.

## DIVISION II :: ORAL PRESENTATIONS

### **Effectiveness of Dynamic and Static Stretching on Lower-Limb Range of Motion and Kinematic Performance During Squats: A Pilot Study**

**Kimberly (Kimmi) Maganda**

*Faculty Sponsor: Prasanna Acharya*

Previous studies have highlighted the benefits of stretching in sports performance and rehabilitation, yet its specific effects on joint function remain underexplored. This study examined the effect of static and dynamic stretching on the range of motion and kinematic parameters during a squat, hypothesizing that dynamic stretching enhances motion and efficiency, leading to smoother and faster squats.

Participants (18 and above years) without injury completed a preliminary questionnaire and provided informed consent. Ping-pong balls were used as markers and placed on the right and left shoulder, hip, knee, and ankle joints. Participants completed 10 squats, which were recorded using two iPhones positioned in the frontal and sagittal planes and analyzed with Kinovea software to assess lower limb range of motion. Each participant completed three squat conditions: (1) a baseline (no stretching) involved 10 squats only; (2) a static stretching involved a five-minute static stretching before performing ten squats; (3) a dynamic stretching involved a five-minute dynamic stretching before completing ten squats, with five-minute rest periods between trials.

Technical difficulties rendered the first trial unusable, but the following trials proceeded smoothly. Joint angles remained consistent across trials, while hip and knee displacement were greater in the static stretching trial. Joint velocity increased following dynamic stretching. There was no knee valgus or varus, though a hip drop occurred in the static stretching trial but not in the dynamic stretching trial. Based on one-person data suggesting dynamic stretching enhances hip and knee range of motion, potentially reducing hip drop. Further data collection is necessary to confirm these effects.

### **Challenging Cornea-Lens Regeneration In The Mature Frog Cornea**

**Ali Daoud**

*Faculty Sponsor: Paul Hamilton*

*Xenopus laevis* tadpoles have the ability to regenerate lenses through signals sent from the neural retina to the cornea epithelium, but this ability is lost post-metamorphosis. However, mature frog corneas still possess the ability to express some lens proteins when challenged to regenerate ex vivo. A leading hypothesis is that the physical presence of the stroma interferes with the ability to regenerate a lens in the mature frog eye, and enzymatic disruption of the stroma could help restore this ability. Previous work in our group suggested that collagenase and amylase can disrupt the stroma while preserving the corneal epithelium. This current study builds on that work by refining the enzymatic protocol. Frog eyes were surgically excised and corneas were treated with an enzyme solution of 15 mg/ml amylase and 1mg/ml collagenase.

Cornea histology was microscopically analyzed for stromal and corneal thickness. Additionally, mature corneas that had been enzymatically treated were challenged to regenerate through culture with tadpole neural retina. In the regeneration experiment, tadpole eyes underwent lentectomy, complete resection of corneal epithelium, and the remaining eyecup received either a piece of enzymatically treated mature cornea or a piece of untreated mature cornea. After 12 days of ex vivo culture, eye tissues were processed for histology, immunostained for lens protein, and analyzed with fluorescence microscopy. Results showed that enzymatic treatment of adult corneas significantly reduced stromal thickness compared with controls. Fluorescence analysis of regeneration experiments revealed some positive staining for lens protein expression in the experimental group and none in the control cornea group. However, morphology was not consistent with a fully regenerated lens and this work continues.

## **Numbers and Nations: A Comparative Look at Math Education in Cuba, Ecuador, and the United States**

**Katie Mae Milhiser**

*Faculty Sponsor: Todd Oberg*

Researching and exploring different perspectives of education offers valuable insight into the diverse teaching methods and philosophies that shape education in the western hemisphere. Each country has developed its own unique teaching approach to mathematics. This presentation is a comparative study of the math education system in three countries: Cuba, Ecuador, and the United States. Drawing from firsthand experiences based on spending a month in Ecuador and one intense week in Cuba, the study considers the similarities and differences relating to curriculum, teaching methods and policies, and the preparation of teachers. There are many differences between Cuba's structured education, Ecuador's emphasis on practical education, and the United States multi-faceted approach to a diverse population, but the drive for student success and engagement is present in all three countries.

## **Strength in Care: Exploring Athletic Training and Strength and Conditioning Internships as a Nursing Student**

**Anna Warner**

*Faculty Sponsors: Prasanna Acharya, Terry Geirnaeirt, Matthew Saey, Tracey Kreipe*

Athletic training and strength and conditioning play an important role in the life of an athlete. Athletic trainers work with athletes to prevent any further injuries, care for any sports-related injuries, and provide rehabilitative exercises to preserve the strength and mobility of the affected area. In contrast, in theory, strength training and conditioning help strengthen areas typically prone to injury in different sports. Together, athletic training and strength training and conditioning work to promote the health and strength of athletes.

As a nursing student minoring in kinesiology, my internship experiences have provided valuable insight into the intersection of healthcare, athletes and their sports performance. This presentation will highlight overlapping concepts and procedural differences between nursing and kinesiology, emphasizing how these experiences could be beneficial when working with athletes and in future healthcare careers. Key areas of comparison will include proper ergonomics and body mechanics, which serve distinct purposes in each field. Further, variations in taping methods and materials used in athletic training and nursing will be discussed. One last concept established in both fields is the motive for rehabilitation. Athletic trainers help athletes return to their competition, while nurses support patients in regaining independence in daily activities.

## **Effects of Arm Length on Hand Placement During Push-Ups to Fatigue: An EMG Analysis of Muscle Activation**

**Jennifer Contreras**

*Faculty Sponsor: Prasanna Acharya*

Push-ups are fundamental upper-body exercises used to assess muscular endurance and strength. However, variations in hand placement and individual biomechanics, particularly arm length, may influence push-up efficiency. This study examined how arm length affects push-up efficiency and susceptibility to fatigue across three hand placements: Normal (NS), Narrow (NaS), and Wide (WS). It is hypothesized that participants with shorter arms will demonstrate greater push-up efficiency compared to those with longer arms. Additionally, narrow push-ups were expected to result in higher tricep and bicep activation due to the increased mechanical load compared to wide or normal push-ups.

Injury-free participants (18 years and above) completed a questionnaire and provided consent. Ping-pong balls were used as markers and placed on the key joints. Afterward, Push-ups were recorded from front and sagittal angles using handheld cameras for joint movement and speed analysis via Kinovea software. EMG sensors recorded biceps and triceps muscle mean activity during push-ups. Participants' shoulder width and arm length were used to determine "normal" hand placement. After a warm-up, participants completed randomized push-up trials in three conditions: NS, NaS, and WS, performing repetitions until failure, with rest periods between trials. Besides kinematics and EMG activity, push-up efficiency based on repetitions performed before fatigue while maintaining form were assessed.

One participant's data has helped refine the experimental setup, such as camera positions, particularly for the sagittal view and the placement of markers for the Kinovea software. A notable trend observed is asymmetry in the shoulders during push-ups, particularly during narrow hand placement conditions. Further data needs to be collected to determine how push-up mechanics interact with arm length.

## **Mass Scheduling: The Use and Application of Computing Power in Organizational Time Management**

**Luke Laurenzana**

*Faculty Sponsor: Takako Soma*

Mass Scheduling, or the scheduling of events to suit the varied needs of large numbers of people, has proven a challenge to any group or organization who has attempted to do so. With traditional approaches, mass scheduling involves the comparison of each schedule to another, with larger groups requiring hundreds of comparisons just to schedule a single event. What would take a human planner hours, however, could be done in seconds with computational power. This presentation will showcase a novel scheduling application, complete with a Web-based GUI, a backend for server-side processing, and a database for persistence across sessions. It will showcase the key features of the application, which include instant schedule comparisons, automated availability analysis, and multi-user schedule management.

## **The Status of Florida's Ghost Orchid (*Dendrophylax lindenii*) as of 2024**

**Toby McTamney**

*Faculty Sponsor: Lawrence Zettler*

Regarded as the most familiar and sought-after of all orchids in the Western Hemisphere, the Ghost Orchid, *Dendrophylax lindenii*, serves as an ecological flagship species for its unique wetland habitats in south Florida, where many other orchids reside. About one-quarter of all Ghost Orchids in the state are found in the Florida Panther National Wildlife Refuge. As of last year (2024), the numbers in the Panther Refuge and throughout Florida have dropped, raising conservation concerns. This talk will present an overview of ongoing efforts to survey populations of this enigmatic species within the Panther Refuge during the past decade. Data on demographics (seedlings, juveniles, mature plants) and fecundity (flowering, fruit set) will also be presented.

## **Viability Assessment of Orchid Seeds and their Mycorrhizal Fungi in Prolonged Cool Storage for Conservation**

**Jena Sellers, Ashley Cedeno, Toby McTamney**

*Faculty Sponsor: Lawrence Zettler*

Orchids need specific types of fungi to facilitate seed germination and seedling development in nature. To effectively conserve these remarkable plants in the wake of ongoing habitat destruction worldwide, seed and fungus banks have been established across the globe to serve a vital purpose for future restoration efforts. ]Since 1996, Illinois College has maintained a sizable orchid seed and fungus storage facility housed in the Parker Science building which contains hundreds of orchid seed and fungus samples. Some of the seeds in our collection are from orchid populations that no longer exist, and our fungus collection includes new species sought by researchers from around the world (e.g., The Smithsonian Environmental Research Center). The purpose of this study is to record (catalogue) all of the seed and fungus samples in cool storage and to assess the viability of these samples. Our ultimate goal is to provide other researchers with the knowledge of what we have, and to safeguard our samples in large international facilities to benefit future conservation efforts.



## DIVISION II :: POSTERS

### Using Machine Learning Algorithms for Modern Human Sex Estimation Based On Lateral Cephalograms

Ali Daoud

Faculty Sponsor: Miranda Karban

**Background:** Machine learning has been used to estimate sex from CT scans and 3D skull models. One study achieved 90% accuracy using convolutional neural networks (CNN) with lateral cephalograms, without measurements. This study compares XGBoost (XGB), Random Forest (RF), and Logistic Regression (LR) for modern human sex estimation using lateral cephalometric measurements from the American Association of Orthodontists Foundation Craniofacial Growth Legacy Collection.

**Methods:** A total of 289 subjects (48% female, 52% male, ages 14-23) were included. Significant measurements were identified through two-sample t-tests ( $p < 0.001$ ). These variables were used in machine learning models, with performance evaluated using curves, Precision-Recall curves (PRC), accuracy, F1-scores, and Matthews Correlation Coefficient (MCC).

**Results:** Significant variables included Sella-Nasion-Point B Angle (SNB), Sella-Nasion Distance (SNDST), SN to Frankfort Angle (SNFHA), Total Face Height (TFHNP), Lower Face Height (LFHNP), Condyle-Point A Distance (COPAD), Condyle-Pogonion Distance (COPOD), and Saddle Angle (SADLA). XGB performed best with 95% accuracy, followed by RF 91% and LR (78%). XGB had the highest AUCs for ROC (0.98) and PRC (0.99), with the highest F1 score (0.96) and MCC (0.90).

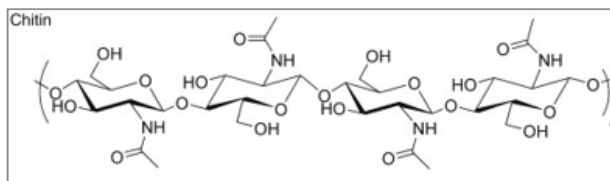
**Conclusion:** XGBoost outperformed RF and LR in sex estimation from lateral cephalograms with high accuracy and reliability. SNDST was the most impactful measurement in all three prediction models, showing Sella-Nasion Distance to be a valuable measurement for sex estimation. This study suggests that machine learning models, particularly XGB, can be valuable for sex estimation in forensic and clinical settings.

### Extraction and Characterization of Chitin from Cicada Shells

Sam Hannig

Faculty Sponsor: Jocelyn Lanorio

This study investigates the extraction and characterization of chitin from the exuviae (molted shells) of periodical cicadas (*Magicicada* spp.) that emerged in Jacksonville, Illinois, in 2024. Chitin, a biopolymer with significant roles in biomedical, agricultural, and industrial applications, was extracted by cleaning, drying at 50°C, demineralizing with 1N HCl, deproteinizing with 1N NaOH and Na<sub>2</sub> CO<sub>3</sub>, and decolorizing with sodium hypochlorite. The isolated chitin was characterized using FTIR, UV-Vis spectroscopy, GC-MS, and <sup>1</sup>H NMR. FTIR analysis confirmed chitin through characteristic C=O stretching bands at 1739 cm<sup>-1</sup> and 1652 cm<sup>-1</sup> (amide C=O), and overlapping O-H and N-H stretching bands at 3463 cm<sup>-1</sup> and 3302 cm<sup>-1</sup>. UV-Vis spectroscopy showed maximum absorbances at 244 and 249 nm, indicative of the  $\pi \rightarrow \pi^*$  transition in chitin. The <sup>1</sup>H NMR spectrum revealed peaks consistent with chitin's theoretical structure, including signals around  $\delta$  1.4-3.9 ppm for glucosamine protons. GC-MS analysis identified compounds, such as acetamide and chitosan derivatives, further confirming the chitin structure. This study demonstrates that cicada exuviae, often left to decompose, represents a substantial and renewable source of chitin. Utilizing these shells for chitin extraction provides valuable educational resources for biopolymer extraction and characterization and promotes sustainable use of biological waste.



## **Impact of Physical Activity Intensity on Academic Achievement in Middle School Students in Illinois**

**Colin McLeod-Demers**

*Faculty Sponsor: Alex Wolfe*

This study examines the link between exercise intensity and academic achievement among middle school students. It explores how varying levels of physical activity—sedentary to vigorous—affect academic performance using accelerometers for precise measurement. Participants included 45 students from a rural public school and an urban laboratory school in central Illinois. After obtaining consent, 31 students met wear-time criteria for analysis. Physical activity was assessed with ActiGraph GT3X accelerometers, and GPA data were collected from school records. Covariates such as age, race, ethnicity, and socioeconomic status were controlled.

For boys, GPA was negatively associated with sedentary activity ( $r = -0.563$ ) and positively with light ( $r = 0.239$ ) and moderate ( $r = 0.237$ ) activities, though results were not statistically significant. For girls, moderate activity showed a positive correlation with GPA ( $r = 0.442$ ), while vigorous activity was negatively associated ( $r = -0.436$ ), both also non-significant. Findings suggest boys' academic achievement correlates with lower sedentary time and higher physical activity, whereas girls' achievement showed weaker associations with activity intensity.

The results indicate a slight relationship between exercise intensity and academic performance. Given these nuances, further research using objective activity measures and diverse academic indicators is needed to determine how different physical activities influence academic skills. Such insights could inform targeted interventions to improve both physical and academic outcomes in students.

## **Does Mandible Development Influence Wisdom Tooth Impaction?**

**Devin Boggs**

*Faculty Sponsor: Miranda Karban*

This study examines whether mandible development influences the impaction of mandibular wisdom teeth, with a focus on the mandible length to height ratio and gonial angles (GA). Utilizing digital X-ray images from the University of Toronto Burlington Growth Study, measurements were taken from 65 subjects (36 males, 29 females) over two age groups: 7.0-9.3 years (age 1) and 15.9-21.0 years (age 2). The results found no significant difference in the GA between males and females at age 1, but a significant difference was shown at age 2. Males showed changes in GA between the two age groups, while females did not. Between the age groups, both sexes exhibited significant differences in mandible length to height ratios. However, no significant differences were found in mandible length to height ratios or GA when individuals with impacted and non-impacted mandibular wisdom teeth were compared. The study also observed cranial length to mandible length ratios, which were found to be significantly different between ages 1 and 2 for both sexes. These findings suggest that while sexual dimorphism in mandible development becomes more distinct after puberty, it does not significantly influence the likelihood of mandibular wisdom tooth impaction. The results oppose previous assumptions that a larger gonial angle reduces the probability of wisdom tooth impaction, highlighting the complexity of factors involved in dental development.

## **Applying Computer Science Strategies to Investigate Math Anxiety's Effects on Cognitive Performance**

**Lucas Schultz**

*Faculty Sponsor: Alex Moore*

This poster presents my experience working on a psychology research project as a computer science student. This involved reading the literature related to the conceptual foundation of the project, learning and implementing new programming language to design the replication study, and building scripts in R to organize, summarize, and analyze data collected. Primary tasks involved coding and optimizing three experiments for replication (Shukla & Bapi, 2022) using the experiment creation software E-Prime 3.0. The tasks require participants to judge if a tone ranging from 100 to 900 ms in length is "shorter" or "longer" than a 500ms standard tone while a number (1 or 9) is also presented on the screen. Further, scripts were built using the statistical computing and data visualization program R to automate essential functions such as reading, organizing, and summarizing the data gathered from our experiments. The script also conducts analyses to create a comprehensive report from the data (ANOVA and t-test), including the creation of graphs illustrating the influence that the digit shown on screen has on the duration judgment of the auditory stimulus. Data collection for this project is ongoing, and preliminary data will be presented.

## Exploring the Relationship between Mathematics Anxiety and Time Perception

**Alicia Pitkin, Rylie Jones-Galvin**

*Faculty Sponsor: Alex Moore*

The present study investigates the effects of mathematics anxiety on the perception of magnitude. Many lines of evidence indicate that numerical, temporal, and other forms of magnitude sensitivities are dependent on overlapping neural networks (e.g., Dormal, Seron, & Pesenti, 2006; Walsh, 2003). Despite this accumulated evidence, there is not a consensus on whether the behaviors associated with these magnitudes are the direct result of this shared neural activity or if other cognitive factors are involved (Donaparti, Shukla, & Bapi, 2024; Shukla & Bapi, 2021; Shukla & Bapi, 2022). The goal of the project is to examine sensitivity to numerical and temporal magnitude and its relation to math anxiety. An individual with heightened mathematics anxiety exhibits activity in brain regions that are known to be correlated with threat detection and pain perception, suggesting that mathematics is a learned fear (Lyons & Beilock, 2012). This anxiety is thought to influence the function of cognitive mechanisms such as attention and working memory due to the overall reduction of mental resources available for task completion (Ramirez, Shaw, & Maloney, 2018). Participants from Illinois College completed the Abbreviated Math Anxiety Scale (AMAS) and a temporal judgment task in which the length of tones was estimated in the presence of numerical digits that were congruent or incongruent with the actual length of the tones. Participants were presented with the number one or nine on the screen and simultaneously a tone ranging in duration from 100 to 900 milliseconds and were asked to judge if the tone played was of a longer or shorter duration. Response biases and reaction times were recorded. This poster will present the preliminary findings from the first of three experiments to be completed for this study.

## Does Dual-Task Walking Affect Cognitive Performance in Individuals with/out Concussion, Negatively or Positively?

**Tsilate Tadesse**

*Faculty Sponsor: Prasanna Acharya*

Studies reported positive effects of priorly executed slight physical activity (SPA) on cognitive performance (CP) in various groups. Others showed CP declines in individuals' post-concussion in single-task conditions without SPA. This study examined the effects of concurrent cognitive and motor tasks (CCMT) with SPA, such as dual-task (DT) walking, on CP in young individuals with a history of concussion (CH) and those without (NoH).

Thirty-five college students (M=20 yrs., 68-inch, 180 lbs.), including 18 CH (8 females; 45 months post-injury) and 17 NoH students (11 females) performed Stroop and D2 sustained attention tests while either standing or walking on a treadmill. The laptop was placed at eye level on top of the treadmill such that they were randomly assigned to standing or walking on a treadmill. Comfortable walking speed (CWS, M=1.7 mph) was determined before the test.

2x2 ANOVAs (standing, walking; CH, NoH) were used to analyze response time (RT; milliseconds) and error rate (ER; %) in both Stroop test conditions, as well as RT, ER and Sustained Attention Score (CS) of the D2 test. For the D2 test, ANOVA revealed a significant effect of body position on ER ( $p < 0.05$ ), suggesting a higher error rate in walking than standing, independent of groups. For the Stroop test, no significant effects nor interactions were found, suggesting Stroop performance was not negatively affected during DT walking compared to standing.

Our results suggest CP declines during DT walking only for sustained attention levels but not for Stroop performance, and no extra CP declines in individuals with CH compared to NoH. The latter outcome contrasts previous work in a similar CH cohort without concurrent SPA such as DT walking. Thus, concurrent SPA may have been a factor in masking potential CP declines in the CH group in the present study.

## Antimicrobial Screening of Orchid Mycorrhizal Fungi as a Potential Source of New Antibiotics

**Beamlak Hiltework**

*Faculty Sponsor: Gwendowlyn Knapp*

Antibiotic resistance is a global crisis driven by antibiotic misuse, the evolution of resistant genes, and environmental factors. The rise of multidrug-resistant bacteria, including ESKAPE pathogens (*Enterococcus faecium*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa*, and *Enterobacter* spp.) poses a severe threat to public health, highlighting the urgent need for novel antimicrobial compounds. This study explores fungi from orchids as a potential source of new antimicrobial compounds. Isolated mycorrhizal fungal strains were tested against various bacterial pathogens to identify new antimicrobial agents. Bioactive strains demonstrating inhibitory effects were extracted, purified, and analyzed to determine their therapeutic potential. In total, nine strains of mycorrhizal fungi demonstrate reactivity. The findings underscore the promise of mycorrhizal fungi as a valuable reservoir for potent antibiotics, offering a potential avenue for combating antibiotic resistance.

## Reusability of $\text{RuCl}_2(\text{PTA})_4$ Catalyst in Biphasic Hydration of Benzonitrile to Benzamide

Paola Gonzalez

Faculty Sponsor: Jocelyn Lanorio

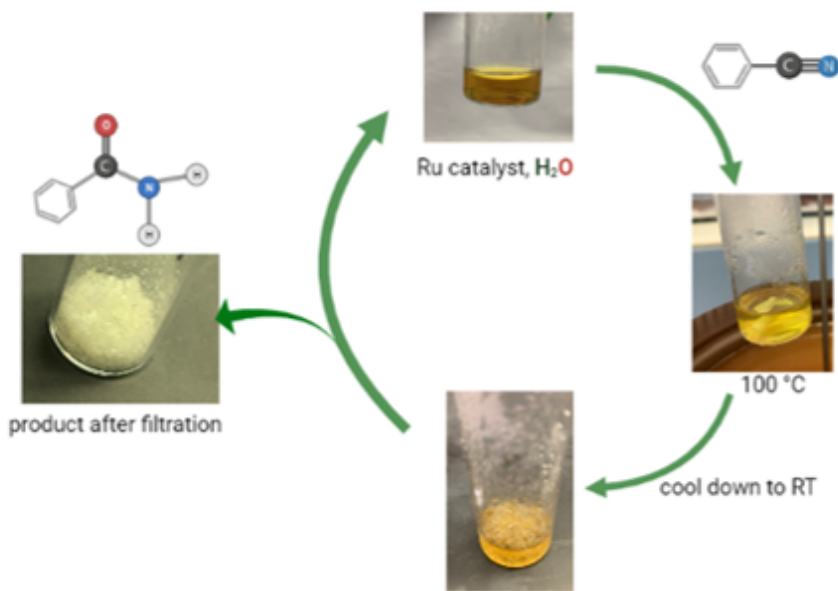
This study investigates the catalytic performance and reusability of the water-soluble  $\text{RuCl}_2(\text{PTA})_4$  catalyst in the biphasic hydration of benzonitrile to benzamide, with water serving

as both the solvent and reagent. The reaction takes advantage of the immiscibility of benzonitrile in water, where the catalyst resides in the aqueous phase, and benzonitrile remains in the organic layer. The system was heated to  $100^\circ\text{C}$  for 24 hours, after which the product, benzamide, precipitated, enabling straightforward catalyst recovery and reuse for subsequent cycles.

The catalyst was reused effectively for up to seven reaction cycles, with isolated yields averaging 43.7%, 29.3%, 33.5%, 31.8%, 22.3%, and approximately 20% across cycles 1 to 7, respectively. Even in the eighth cycle, a significant 92% conversion of benzonitrile to benzamide was observed despite the presence of a small amount of unreacted benzonitrile. This demonstrates the catalyst's strong reusability and stability over multiple cycles.

Characterization of the product through melting point, TLC, IR, GC-MS, and NMR confirmed the successful formation of benzamide. TLC analysis showed  $R_f$  values of 0.8 for benzonitrile and 0.3 for benzamide, while GC analysis indicated retention times of 5.9 minutes for benzonitrile and 7.6 minutes for benzamide. IR spectra revealed the loss of nitrile stretches at  $2290\text{ cm}^{-1}$  and the appearance of NH stretches at  $3364\text{ cm}^{-1}$  and  $3167\text{ cm}^{-1}$ , alongside a  $\text{C}=\text{O}$  stretch at  $1655\text{ cm}^{-1}$  for the benzamide product.

This work demonstrates the efficiency of  $\text{RuCl}_2(\text{PTA})_4$  in biphasic systems, offering a sustainable approach to catalysis with minimal waste and successful catalyst recycling. Future studies will aim to optimize reaction conditions to improve yields in extended cycles.



## Playing in Dirt: The Search for New Antibiotics

Ashley Olson

Faculty Sponsor: Gwendolyn Knapp

Bacterial resistance to antibiotics has emerged as a global public health threat. The overuse of antibiotics in both clinical and agricultural settings has contributed to the spread of multidrug-resistant (MDR) bacterial pathogens. New antibiotics are needed to combat this growing problem. To identify new sources of antibiotics, environmental soil samples were collected and the bacteria tested for their ability to inhibit growth against potential pathogens. Several antimicrobial-producing bacterial strains were isolated and underwent characterization through biochemical testing and 16s rRNA sequencing. Ongoing research will characterize the chemical compounds causing the antimicrobial activity.

## **Substance and Smartphone addiction amongst Illinois College Students**

**Raymundo Martinez Jr.**

*Faculty Sponsor: Yu-Hua Yeh*

Substance use and smartphone addiction have been widely studied and recognized as significant problems in the US. However, little is known about how these issues affect Illinois College (IC) students. In this study, fifty-three IC students responded to an anonymous online survey examining their substance use and smartphone addiction. The data showed a wide range of substance use across the participants, with an average of 26.4% reporting past use. Regarding smartphone addiction, 55.6% of participants were classified as highly addicted. The findings provide the first glimpse of substance and smartphone use on the IC campus, which appears to be a prevalent issue to be addressed.

## **Surveying the Environment for Antimicrobial Resistance**

**Princess Akyea-Obesbea**

*Faculty Sponsor: Gwendolyn Knapp*

Antimicrobial resistance (AMR) is a growing global health problem. Understanding the prevalence of AMR in the environment is important to combating the problem. Therefore, environmental soil samples from various locations in Morgan County, Illinois, were collected, and the resistance levels to different antibiotics were determined. Additional testing using Kirby-Bauer tests were carried out to confirm the observed resistance. PCR analysis was attempted to detect known genes involved in resistance mechanisms.

## **Inhibition of Tyrosinase by Indole Derivatives**

**Isabelle Norris, Michelle Maag**

*Faculty Sponsor: Zvi Pasman*

Tyrosinase is a metalloenzyme that contributes to the biosynthesis of melanin, a pigment responsible for the coloration of eyes, skin, and hair and is responsible for the enzymatic browning reactions in fruits and vegetables. Excessive tyrosinase production can lead to hyperpigmentation and increased food spoiling. Therefore, it is desirable to identify effective tyrosinase inhibitors. We measured the steady-state kinetics of tyrosinase by monitoring the absorbance of dopachrome at 475 nm. 5-hydroxyindole proved an effective inhibitor at 1-25  $\mu$ M. We continue to define the type of inhibition exhibited by 5-hydroxyindole. We confirmed that kojic acid was a competitive inhibitor. In contrast, N'-Hydroxy-4-methoxy-1H-indole-3-carboximidamide and 4-indolyl acetate were not inhibitors of tyrosinase. Their lack of inhibition may be explained by their bulky structures in comparison to 5-hydroxyindole. Future work will aim to identify additional compounds that can inhibit tyrosinase. Steady-state kinetics will be used at different inhibitor concentrations to define the effectiveness of the inhibition.

## **A State-of-the-Art Neurofeedback Framework: Integrating Wireless EEG, Virtual Reality, and Eye-Tracking Technology**

**Juliana Rensing**

*Faculty Sponsor: Yu-Hua Yeh*

Neurofeedback uses electroencephalography (EEG) to provide subjects with real-time information about their brain activity, enabling them to gain control over or become aware of their brain functions. This technique has been effective in improving conditions such as anxiety, ADHD, and substance addiction, as well as advancing neuroscience research. With the development of virtual reality (VR) headsets, efforts to implement neurofeedback through VR have emerged, marking the state-of-the-art of this technique. In this project, we utilized the equipment available on campus to create a neurofeedback framework that integrates VR. This framework involves recording brain signals through wireless EEG, transmitting the data to a VR headset via BIOPAC, and representing these signals in the VR environment. Additionally, the subjects' gaze was simultaneously recorded and analyzed using eye-tracking technology enabled by the VR headset. The integration of wireless EEG, VR, and eye-tracking opens new possibilities for more immersive neurofeedback intervention and for answering research questions that were not possible without this framework.



## **Reviving the Flame: Defeating Burnout in Healthcare Workers**

**Alexis Blackley, Justine Agsalda**

*Faculty Sponsor: Elizabeth Rellinger-Zettler*

Healthcare workers have long shifts that are often highly intensive and occur in environments that are frequently low in support and encouragement. In addition, healthcare workers frequently need to care for patients with negative outcomes. Thus, it's not surprising that a high percentage of healthcare workers experience burnout (Ilhan et. al, 2007). However, healthcare providers who work in environments with opportunities for positive reinforcement and who have strong social support systems are less likely to experience burnout. In this study of 153 healthcare workers, we assessed factors such as coworker relationships, the challenges that healthcare workers face, and how they cope both inside and outside of the workplace. Participants completed self-report surveys including the Copenhagen Burnout Inventory, Moral Distress Scale for Healthcare Professionals, and the Professional Quality of Life Scale for Health Workers. We also asked healthcare workers how often they engage in hobbies or pastimes as a way of coping with stress. It was hypothesized that implementing safe and supportive environments can create less burnout for our healthcare workers. Interactions between these variables and other results will be discussed.

## **Healthcare in Human Perspective: The Impact of Spirituality, Support System, and Resilience on Moral Distress**

**Justine Agsalda, Alexis Blackley**

*Faculty Sponsor: Elizabeth Rellinger-Zettler*

On a daily basis, many healthcare workers are asked to work with individuals who are experiencing pain and fear. In some cases, they may also be dealing with a number of crises at the same time (Fischer-Grönlund et. al, 2023). One way to capture these stressors is to consider the moral distress (Fischer-Grönlund et. al, 2023) witnessed by healthcare professionals. Furthermore, healthcare professionals are also humans with varying levels of support and resilience which may impact their ability to cope with moral distress. In this study, we explored the role of spirituality, support systems, and personal beliefs on resilience in the face of moral distress. 153 healthcare workers completed self-report surveys including the professional quality of life scale for health workers and the Measure of Moral Distress for Healthcare Professionals. It was hypothesized that healthcare workers with higher levels of social support and a clear sense of their spiritual values will be better able to manage the moral distress they experience when working with patients and be more resilient, with further results to be discussed in our presentation.

## **Gene Expression of Wnt/ $\beta$ -catenin Inhibitors during *Xenopus laevis* Cornea-Lens Regeneration**

**Avery Westlake**

*Faculty Sponsor: Paul Hamilton*

Lens regeneration from the cornea has been observed in *Xenopus laevis* tadpoles, however, the molecular mechanisms behind this process are not yet fully known. The involvement of Wnt/ $\beta$ -catenin signaling has proven to be an important part of this process. This project focused heavily on understanding inhibitors of this pathway and their role in the process of regeneration. To begin, lensectomies were performed on stage 48-54 tadpoles who were then allowed a period to recover. Regenerating cornea epithelium and neural retina tissue were collected from the eyes of the tadpoles after 0, 24, 48, 72 or 96 hours. RNA was extracted from the tissue in order to generate cDNA using a kit specially designed to amplify genes expressed from single cells or low quantities of tissue. cDNA was used for qPCR analysis using custom primers designed to detect the expression of secreted frizzled-related proteins (sfrp 1-5) and dickkopf proteins (dkk 1-3), known inhibitors of Wnt/ $\beta$ -catenin signaling. The single-cell/low-quantity kit did not substantially increase the amount of cDNA generated compared to other methods used in the past. This project remains ongoing to improve the CT values of the qPCR in order to achieve statistically meaningful results.

## **An Investigation of Nectar Composition in *Platanthera ciliaris* and *Platanthera integrilabia*: Insights into Pollinator Specificity and Conservation**

**Sydni Maggart**

*Faculty Sponsors: Brent Chandler, Lawrence Zettler*

The orange fringed bog orchid (*Platanthera ciliaris*) is distributed throughout eastern and central North America. It is commonly found in wetland habitats including bogs, marshes, meadows, and open woodlands. While globally secure, its populations are often sparse along the western limits of its range. In contrast, the white fringeless orchid (*Platanthera integrilabia*), native to the southeastern United States, is federally listed as endangered due to its restricted distribution and small, declining populations. This study examines the nectar composition of *P. ciliaris* and *P. integrilabia* to better understand their pollinator interactions. In 2024, nectar samples were collected from both species in naturally propagating populations that included densely forested areas with filtered light to open environments with full sun exposure. Samples were analyzed for primary carbohydrates—sucrose, glucose, and fructose—as well as secondary compounds and amino acids. Results show an average total sugar concentration of 12% and 19% respectively for *P. ciliaris* and *P. integrilabia*. Both species had consistently high levels of sucrose consistent with lepidoptera feeding. Additionally, both species had a high fructose-to-glucose ratio. These nectar composition findings are consistent with attracting specialized pollinators and have implications for understanding orchid reproductive ecology and conservation strategies.

## **Design of Micro-Supercapacitors Through Graphene-Oxide Synthesization**

**Hannah Lueke**

*Faculty Sponsor: Josiah Kunz*

The synthesis of graphene oxide (GO) and its subsequent application in composite electrodes involve a meticulous series of chemical and mechanical processes to ensure high performance and structural integrity. This study outlines a systematic approach to GO fabrication, emphasizing design and procedural methodologies crucial for reproducibility and efficiency.

Graphene oxide is synthesized using a modified Hummers' method, where graphite powder is oxidized through a controlled reaction with sulfuric acid, phosphoric acid, and potassium permanganate. The reaction mixture is stirred at precise intervals to achieve a uniform oxidation state, verified through colorimetric changes. Excess reagents are removed through successive washing with hydrogen peroxide, hydrochloric acid, and deionized (DI) water, followed by centrifugation to isolate purified GO. The resulting product is filtered and vacuum-dried to obtain a yellowish GO powder, essential for further analysis and application.

The GO is then subjected to Fourier-transform infrared spectroscopy to confirm the presence of characteristic functional groups. Once validated, GO is dispersed in ethanol to form a solution for electrode synthesis. A composite electrode is fabricated by mixing GO with MXene at a predetermined 1:10 volume ratio, ensuring optimal electrochemical performance. This solution is deposited onto a PET substrate and cured into a film, which undergoes laser patterning for enhanced conductivity and structural precision.

A gel electrolyte is prepared by dissolving polyvinyl alcohol in DI water at elevated temperatures, followed by the incorporation of phosphoric acid to create a conductive matrix. The assembly phase involves the uniform coating of the patterned electrode with the gel electrolyte, attachment of copper wires for electrical connectivity, and encapsulation using ultra-thin polyimide tape to enhance durability and prevent degradation.

This process underscores the critical importance of precision in reagent ratios, mixing conditions, and processing techniques. The integration of laser patterning further enhances electrode performance, demonstrating a scalable and efficient approach for high-performance energy storage applications.

## **In Silico Study of Tyrosinase and Its Inhibition via Docking and Molecular Dynamics (MD) Simulations**

**Katherine Gilbert**

*Faculty Sponsor: Clayton Spencer*

Tyrosinase is an enzyme found in fruits, vegetables, mushrooms and human skin. It's responsible for the browning of produce and hyperpigmentation in skin. Using various computer-based simulations allows for visualization of the mechanisms behind this enzyme's inhibition. Using VMD, Autodock Vina, Pymol, and NAMD 3.0 to examine the structure of Tyrosinase when bound to its substrate L-Dopa or selected inhibitors allows for comparison of potential active sites and calculation of binding free energies and inhibition constants ( $K_i$ 's).

## **Examining the Response of Bats to the Playback of Conspecific and Heterospecific Distress Calls - FOMA**

**Ysabella Adubato, Abigail Beddingfield, Amelia Eldridge-White**

*Faculty Sponsor: Bryan Arnold*

Distress calls are vocalizations produced by many vertebrates in response to a perceived threat. For some species, these calls have been shown to elicit assistance from a social groupmate, to startle or confuse the predator, increasing the likelihood of escape, or possibly warn others of the threat. In some cases, the calls attract the attention of both heterospecifics and conspecifics, but the reasons why are often unclear. Playback experiments are a powerful method that can be used to explore the function of vocalizations like distress calls. While this method is deployed often in bird studies, it is less common for bats. In this study, we utilized field recorded distress calls of evening bats and big brown bats as playback stimuli, in addition to white noise control, in a field playback experiment. We measured the responses of bats using automated recorders arranged in an array with an ultrasound amplifier and speaker in the middle playing back the sounds and the recorders 4 meters to either side. Our response variable was scored as the difference between activity during a 5-minute silent period prior to the sound playback and the 5-minutes of sound playback. We also monitored activity during a 5 minute period after the playback. We used Kaleidoscope to score bat passes, analyze recordings, and identify bats to species based on their species specific echolocation calls when possible. While this is a preliminary study, thus far we have found reduced activity during the playback compared to the silent period. This effect was somewhat stronger for distress calls versus the control. Big brown bats also showed the highest level of response compared to other species. Further work will continue to explore species specific responses to examine conspecific and heterospecific activity in relation to the presence of distress calls.

## **DIVISION III :: ORAL PRESENTATIONS**

### **College Student Identity and Educational Attainment in the United States**

**Abigail Buchanan-Kenzinger**

*Faculty Sponsor: Marilyn Markel*

My research explores the dynamic nature of modern language surrounding sexual orientation and gender identity (SOGI) from nationally representative surveys in the United States. The foundation of the project began with a literature review of historical progressions on the language used for SOGI questions on these surveys, including the U.S. Census and longitudinal health surveys. From this work, we will later use the applications for survey methodology to produce a survey of college students' educational attainment and career aspirations. The product will also encapsulate modern identity language and terminology to better represent students, but more broadly population, demographics. The aim is to address longstanding shortcomings in economic literature and survey design on SOGI identity as it applies to outcomes in education and earnings. Accurately understanding these findings is only possible with a mode of data collection representative of how agents identify themselves. Any shortcomings in categorizations of identity due to political fallacies currently result in misrepresentations that make it difficult to realistically model economic behavior and trends. Discrepancies across labor outcomes by either gender or sexual identity are also relevant. Exploration of these themes amongst student identities is a novel approach that will greatly aid in addressing gaps in the literature. With the implementation of this survey, information can be acquired on ways university students describe their sexual orientation and gender identity; consequently, expanding informative guidelines for inclusive survey design.

### **The Art of Gift Giving: How to Pass on Your Wealth Without the Taxman Tagging Along**

**Camille Lyons**

*Faculty Sponsor: Emily Wright*

Tax season- it is a time dreaded by many individuals who have to pay additional taxes where others will receive a refund from federal or state governments. Some of this discomfort comes from the lack of knowledge about taxes, leading most to hire a tax professional. These professionals, usually with Certified Public Accountant (CPA) designation, have a high level knowledge of deductions and credits to help reduce one's tax liability. Oftentimes, the tax field becomes unclear when discussing the differences between estate and gift taxes. Depending on which of these two categories the assets fall into, they will be taxed differently. To get the best deal, meaning the most money back into the taxpayer's pocket, certain assets can avoid higher taxes or even taxes altogether. To do this legally, research has been done using the United States Internal Revenue Code enacted by Congress to understand the limitations of estate and gift taxes. In addition to a CPA, tax attorneys and wealth advisors can offer further assistance with the use of various trusts such as a Grantor Retained Annuity Trust or Crummey Trust. Combining the skills of several financial professionals, estate and gift taxes have been successfully avoided with reclassification, trusts, thresholds, splitting, and more.

### **Every Clue Counts- How Evidence Catches a Killer**

**Chiara Paltretti, Sara McAuliffe, Abigail Zdenek**

*Faculty Sponsor: Angela Gonzales Balfe*

This presentation will discuss how our laws and legal system go into effect when investigating crimes. It is based on the Criminal Investigation class, and it will focus on the importance of evidence as proof that a crime has been committed and that a person committed it. We will go through the mock murder we worked on for an entire semester and the proper way to see, collect, use and present evidence to catch a criminal. We conducted the criminal investigation using grounded principles and practices found in Criminal Investigation 11th Edition (Orthmann & Hess, 2017). In addition, we utilized information from the US Constitution and US Supreme Court Decisions. At the end, the audience will decide if there is sufficient probable cause. But remember: there has to be evidence that a crime has been committed by that particular person, for them to be indicted.

### **Film analysis of Pocahontas**

**Kaylah Villalobos**

*Faculty Sponsor: Jaclyn Tabor*

When Disney's Pocahontas was released in 1995, it was held up as a progressive depiction of an indigenous story. However, over time, this movie has been viewed through a less favorable lens. This presentation highlights the controversies and historical inaccuracies associated with Disney's Pocahontas and reflects on the importance of indigenous representation both on and behind the screen.

## **Are We Passing Yet? Transgender Portrayals in Film and Video Games**

**Christopher Jones**

*Faculty Sponsor: Jaclyn Tabor*

As transgender identities and stories have proliferated in the media, questions remain about the nature of this representation. Is all representation “good” representation? We address this question by modifying three “tests” (Bechtel, Vito Russo, and May Tests) to understand transgender representation. Creating a comprehensive dataset of 186 films and video games with transgender characters, we evaluated whether each passed the three tests. Findings identify that increased transgender representation in films has not coincided with “test” passing – depictions of transgender people largely remain stereotypical and superficial. However, video games are a different story, with a high incidence of test-passing among games with transgender characters. We reflect on the implications of our findings for representation across media types and for transgender representation more broadly.



## DIVISION III :: POSTERS

### **Beyond Borders: HR's Evolving Role in the Global Value Chain**

**Matea Aleksandrovska**

*Faculty Advisor: Michael Harden*

Since its inception in the early 20<sup>th</sup> century, Human Resources (HR) has played a vital role in organizational stability and success throughout the value chain. Regional differences in hiring practices, retirement funds, Paid Time Off (PTO), workplace laws and regulations, require HR's swift and efficient adaptation to retain a competitive and motivated staff. Furthermore, HR plays a critical role in value chain optimization by ensuring that a well-structured labor management strategy supports and maintains every company function. Through the Business Simulation Game (BSG) in BU 491, we have been managing a fictional shoe company, navigating business decisions and challenges in diverse markets across North America, Asia-Pacific, Europe-Africa, and Latin America. This project explores how fundamental HR functions, like compensation, talent acquisition, and compliance differ across the regions due to economic, cultural, and legal differences. This project illustrates the wider ramifications for internationally operated businesses by exploring these dynamics through the prism of our BSG. Developing successful workforce strategies that strengthen corporate performance requires an understanding of HR's ever-evolving nature among different parts of our world. This project clarifies HR's role in managing value chain challenges and opportunities while comparing the function's observed practices across different global regions and how they shape business operations.

### **Illinois College Students' Most Used Media Sources and Their Opinions on the Conflict Between Israel and Palestine**

**Kalli Avera**

*Faculty Sponsor: Yu-Hua Yeh*

The relationship between media consumption and individual ideology has been widely recognized. However, the specific media sources commonly used by IC students and how these sources influence their ideology remain unclear. This study aims to assess the most used media sources on campus and examine how media consumption has influenced students' opinions on the conflict between Israel and Palestine in the last year. A structured, in-person interview was conducted with the recruited participants to gather their responses to the research questions. The Political Typology Quiz by Pew Research was utilized to explore the potential influence of political alignment on the discussed topics. The collected data were analyzed both qualitatively and quantitatively to identify general patterns. This study allows us to better understand where IC students receive information and to what extent biases from these sources influence individuals' opinions on different topics by using the conflict between Israel and Palestine as an example.

### **Survey Design: LGBTQIA+ and Union Membership Studies**

**Imasuen Odosamamwen**

*Faculty Sponsor: Marilyn Markel*

This research is part of a broader project exploring the evolution of SOGI (sexual orientation and gender identity) language on nationally representative surveys in the United States. The project seeks to answer key questions: What is the relationship between job turnover or job satisfaction and sexual and gender minority (SGM) protections? Do SGM employees join unions at a higher rate? Are those employees joining unions for more protection (or any protection if company/state policy does not apply)? This research aims to (1) aid in the creation and implementation of a survey on educational attainment, career and earnings expectations, and SOGI language for college students, (2) begin work on data collection and analysis from this survey, and (3) further existing work on SOGI and economics literature.

## **Cultural Insights of Spain to American Culture**

**Samantha Godlewski**

*Faculty Sponsor: Jenny Barker-Devine*

In March of 2023, I was granted the opportunity to immerse myself in the diverse culture and history of Spain. During my time, I was able to explore the two distinct cities of Madrid, the vibrant capital, and Pamplona, famous for its historical significance and cultural heritage. My experience in these cities offered valuable insights into Spain's cultural, political, and historical events, each providing a unique perspective on the country's identity.

In Madrid, I was able to see how the dynamic of the city and modern life thrived in comparison to the historical bones. As the capital, Madrid is a hub of cultural and political influence and I was in awe by the contrast of its majestic historical sites, such as the Royal Palace and Prado Museum, and its lively, contemporary atmosphere. I watched how the city's art, architecture, and lifestyle reflect Spain's diverse cultural heritage, while also maintaining global trends. In contrast, Pamplona provided a more intimate and traditional experience. Most known for its Running of the Bulls, Pamplona's historical roots offer a deep connection to Spain's past. I explored the city's medieval architecture, such as the Pamplona Cathedral, and reflected on the traditions that continue to shape the identity of its residents.

With this poster, I aim to share the reflection of my journey through these two cities, emphasizing the diverse ways Spain's history, culture, and modernity are intertwined. I hope to offer a window into the lives of those who call these cities home, showcasing the balance between tradition and progress in contemporary Spain in hopes to influence other students in the interest in exploring these beautiful cities on their own.

## **Examining Diversity Initiatives in Organizations**

**Rahim Bolden**

*Faculty Sponsor: Allison Burrus*

The purpose of this poster is to provide a deeper understanding of how diversity initiatives affect the business world. Over the past few years, there has been a significant increase in efforts across the United States to promote diversity in various sectors, including education, neighborhoods, workplaces, sports, and entertainment (McKinsey & Company Report 2015). The research presented in this poster focuses specifically on the business world, examining how companies have implemented diversity and inclusion initiatives, the historical context behind these efforts, and their effectiveness (Hunt et al 2018). I collected data on the top 25 Fortune 500 Companies and read through their respective Diversity Equity and Inclusion reports and gathered information on their retention rates, diversity inclusion procedures, hiring outcomes, employee satisfaction, workers retention, diversity in the higher ups of the company, profit, and diversity bias cases. Through this analysis, I aim to demonstrate that companies prioritizing employee well-being and genuine inclusivity achieve greater success than those merely seeking to boost diversity numbers for appearance's sake.



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