

STUDENT SCHOLAR SYMPOSIUM

FALL SESSION

November 29, 2023

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Greetings and welcome to the Fall 2023 Chapman University Student Scholar Symposium!

Student Scholar Symposium which is held once each semester celebrates the remarkable scholarship and creativity conducted by Chapman undergraduate students. Our student presenters reflect the diversity of academic and creative disciplines thriving within the Chapman community. The Symposium allows them multiple ways to showcase their research and creative projects.

Please take some time to stop by and wander through the vast array of student poster presentations or attend the oral discussions to discover the kind of work our students are engaged in here at Chapman University. Student Scholar Symposium is education in action, a true example that Chapman students are pursuing anything imaginable.

Student Scholar Symposium is sponsored by the Center for Undergraduate Excellence, which is the first stop and the central hub for students to learn about and engage in undergraduate research and creativity activity; and to discover the wide range of prestigious external scholarships available.

Our symposium would not have been possible without the extraordinary effort by the CUE staff, Lisa Kendrick, Operations Manager, and Audrey Lin, Administrative Assistant, and Cole Clark, Graduate Assistant, who have designed, developed, and organized the event. A special thanks to all of them!

Thanks to all the student presenters, their faculty mentors, our faculty moderators, and staff volunteers.

Enjoy the Symposium!

Dr. Julye Bidmead
Director of the Center for Undergraduate Excellence at Chapman University

Acknowledgements and Schedule

The Center for Undergraduate Excellence gratefully acknowledge the following individuals and program for their support:

Student Scholar Ambassadors

Oral Presentation Moderators:

Dr. Joceyln Buckner

Dr. Kelli Fuery

Dr. Jan Osborn

Staff Volunteers:

Adena Hamilin

Erika Orejola

Kate Corcoran

Lonnise Magallanez

Ashley Whelpley

Hilary Anderson

Katy Gilbertson

Robyne Kelly

Dana Dacier

Jackie Coyne

Lisa Beesley

Samuel Lee

Presentation Schedule

Oral Session 1	AF209AC	9:00 – 10:00 AM
Poster Session 1	BK404	10:00 – 11:30 AM
Oral Session 2	AF209AC	11:30 - 12:30 PM
Poster Session 2	BK404	12:30 - 2:00 PM
Oral Session 3	AF209AC	2:00 - 3:00 PM
Poster Session 3	BK404	3:00 - 4:30 PM

Room 209A

Moderator: Dr. Jocelyn Buckner

Theatre

9:00 – 9:15 AM

Clare Barron’s Dance Nation Addresses the Growing Pains of Feminism Through Play of Adults Playing ‘Tweens’, for Adults”

Presenter(s): Alicia Alexander

Advisor(s): Dr. Jocelyn Buckner

In February 2021, I attended the University of Michigan’s production of Clare Barron’s 2018 play titled Dance Nation. In a dark black box theatre, I was taken aback by how a play could be so entertaining, comedic, vulgar, and honest, all at the same time. Based on the 2011 reality television show Dance Moms, the play showcases a group of middle school girls who battle the tensions of competing against each other in the stereotypical dance studio environment, all the while, experiencing new, intense instincts that come with puberty. Tensions of the show live at an all time high, as it divulges into the relationships between women and their surroundings, as these adolescent girls interact with their parents, teachers, and each other. The play leaves a lasting impression of comedy and realism that overall addresses the struggles of feminism in our world today. The play discusses relationships, body image, competition, love, while addresses how women interact with each other, and how they act towards other characters in the studio, based on their sex, gender, status, and the subconscious tensions between women. I present that Dance Nation addresses a realm of feminism through growing pains and humor of childhood, in an adult lens, utilizing the duality of play and consciousness; adults playing tweens, for adults. To prove this statement, I will conduct research of Barron’s work, specifically in her character relationships in the play. I will research Dance Moms and other inspirations of the show, as characters and situations in the play act as real life examples of how and why these young girls interact in the manners that they do. I will explore this and demonstrate all that I feel this play stands for in regards to feminism, and showcases why theatre needs female playwrights and works such as this.

9:15 – 9:30 AM

Theater as a Rehabilitation Tool: Inside The Actors’ Gang Prison Project

Presenter(s): Jose Briseno

Advisor(s): Dr. Jocelyn Buckner

The USA currently imprisons over 2.2 million people. Of those, about 70 % will be rearrested within 3 years of release. The reason for these high rates is due to the fact that the justice system focuses mainly on ways to punish people by incarcerating them rather than rehabilitating them.

Marginalized communities, specifically BIPOC communities disproportionately targeted by the justice system, do not have the necessary funds or resources to aid them in reintegration which creates a never-ending cycle of recidivism. A way to combat such high recidivism rates is to implement rehabilitation programs within the prison. In this study, I will examine the impacts of the Prison Theatre Program by focusing on The Actors Gang's Prison Project. Founded in 2006, the Actors Gangs Prison Project aids inmates in establishing a supportive community, offering tools for recognizing and managing their emotions, and creating systemic change by centering the voices of those who have been system-impacted.

By interviewing current staff members as well as alumni who went through their program, I will gain first-hand knowledge of what their process is like as well as their outcomes. This research also includes field studies of performances that the program puts on. Finally, I will be researching the type of theater they use as a foundation for their work, these types being Commedia Dell'arte, Improvisational theater, and theater of the oppressed. I aim to prove that theatre prison programs such as the Actors' Gang reduce recidivism rates and are an effective rehabilitation tool for those who have been incarcerated.

9:30 – 9:45 AM

The Need for Theater as a Political Tool in Argentina

Presenter(s): Emily Tolli

Advisor(s): Dr. Jocelyn Buckner

Invisible Theatre is a theatrical performance technique that occurs in a setting where it is typically unexpected. It involves actors performing rehearsed scenarios that reflect real life occurrences, in public spaces where the audience is unaware that a performance is taking place in front of them - and it is often not revealed to them afterwards. This practice began in Argentina in the 1970s as a method of commenting on the political and economic nature of the country while evading police violence. Theater of all kinds should be fortified in Argentina since the country sees such little influence or encouragement of the arts overall. However, the political climate at the moment - record highs of police abuse, poor prison conditions, extreme poverty, inflation, gendered violence against women, etc. - make it unsafe for citizens to comment freely on social justice needs. The comeback of invisible theater would allow Argentine citizens to force others to confront these issues and demand sustainable change. This specific form of theater is important currently because it offers anonymity, and therefore protection, for the performers. Furthermore, the fact that the performance is never revealed to be rehearsed makes the reflection process for the audience even more pressing - and begs individuals as well as social justice organizations to act quickly.

My thesis aims to furthers the push for human rights justice in Argentina by exploring the ways in which the return of Invisible Theatre effectively resists political injustice.

9:45 – 10:00 AM

Finding Voice After Silence: The Process of Creating Art Through Trauma and Loss

Presenter(s): Kaelin Tester

Advisor(s): Dr. Jocelyn Buckner

My project, Look Into My Eyes, is a play that was created during a year when I was both experiencing and healing from the pain of an abusive relationship. It was created when I felt like I was at my lowest, when I had no way to express the pain that I was feeling when I was dealing with complicated friendships and relationships. This play was a compass that I used to navigate both my complex emotional state and the cascading relationships around me. It was a safe space to explore the intricate feelings of loss, grief, and growth I was experiencing through the art of playwriting, with the intention of producing it into a finalized theatrical production.

The purpose of this project is to provide a space for people to share their experiences and the complexities of relationships and love through the collaborative art of theatre. This project is an exploration of the different ways people experience grief, heartbreak, love, and community.

This thesis will showcase how pain developed into a script into rehearsals and then finally a full length play that will be produced. In addition, it will explore the process in which artists take the pain and complexities of their lives and turn it into art. It seeks to explore how you can heal and grow through the act of creation.

Room 209C

Moderator: Dr. Kelli Fuery

Integrated Educational Studies

9:00 – 9:15 AM

Filipino/a/x Americans Navigating Predominantly Campus Climates

Presenter(s): Myra Dayrit

Advisor(s): Dr. Stephany Cuevas

This study argues that Filipino/a/x Americans at predominantly white campus climates share similar experiences to students of color at predominantly white institutions. To further our understanding of how Filipino/a/x American students navigate predominantly campus climates, this study applies the AsianCrit tenet of Asianization to focus on how these students experience perpetual otherness within their institution through the examination of 11 Filipino/a/x Americans perspectives. The study finds that the participants felt the culture of the university was predominantly white, cultivating a sense of otherness within their peers and their institution.

Music

9:15 – 9:30 AM

The Tragic Chorus: Representations of the Musical Culture of Ancient Athens

Presenter(s): Emma Brandel

Advisor(s): Dr. Jessica Sternfeld

While the Ancient Greeks had a profound impact on many aspects of the modern world, including music, their performance and composition of music are still very foreign to modern ears. One musical context that could give insight to the culture it comes from is that of Classical period Athenian tragedy. Performed at the Dionysian festival each year, the works of the tragedians Aeschylus, Sophocles, and Euripides make up all of the knowledge we now have of Ancient Athenian theatre, and the music that accompanied it. By examining texts from the scant 33 extant plays attributed to these authors, what can we learn about the music of the period, both inside and outside of a theatrical setting? Well, we can use the evidence of the tragic chorus to guide our investigation. The ancient chorus developed across the fifth century as the genre of tragedy did itself; this paper examines how the physical presentation as well as the narrative purpose developed across the three tragedians' lifetimes. Finally, by learning about the near-contemporary music theorists that arose in the following century and how they conceptualized musical modes and lyric meters, we are able to infer the intended moods and tones certain passages were intended to evoke.

Peace Studies

9:30 – 9:45 AM

Creating a New Family: An Analysis of the Korean Unwed Mothers' Families Association's Work to Aid Single Mothers in South Korea

Presenter(s): Emma Walker

Advisor(s): Dr. Minju Kwon

Feminism is popularly conceived as a Western movement; however, in an ever-globalizing world, such topics have become prominent in East Asia. In the case of South Korea, where patriarchal structures have influenced sectors of society such as politics, media, and healthcare, ever-increasing women's rights movements have taken the spotlight. Both radical and reformist feminist movements have spread in South Korea, promoting women's rights, yet both movements shy away from the topic of protecting single mothers. While the Korean Unwed Mothers' Families Association (KUMFA) works towards creating a world where unwed mothers can raise children without discrimination or stigma, many other feminist movements tend to overlook this topic. How does the Korean Unwed Mothers' Families Association (KUMFA) work to address the societal stigma surrounding single mothers in South Korea? Being a single parent in Korea is highly stigmatized due to a conflux of societal norms, Confucian culture, and lack of aid from

governmental organizations. KUMFA is the leading organization to address the stigmatization of single mothers in South Korea and actively works towards addressing the concerns of these women and combating the societal expectations of pushing out single mothers. Within South Korean legislation, single parents, especially single mothers, are often disregarded and not given institutional support to fight against stigma. Through a qualitative content analysis of the work of KUMFA, I will examine if organizations such as KUMFA have the potential to create change on the societal level for single mothers in South Korea. Results will be able to highlight what works in organizations for societal change and what can be improved to benefit single mothers' rights.

Public Relations and Advertising

9:45 – 10:00 AM

No One Really Knows, an Advertising Campaign for Indeed, 2023

Presenter(s): Tyler Weitzman, Kyndal Workman, Delaney Goodwin

Advisor(s): Kathryn Thibault

Chapman's National Student Advertising Competition team was challenged by the American Advertising Federation to create an omnichannel advertising campaign for Indeed, making it the go-to job site resource for 18-24-year-olds, whether they're actively applying, searching or just exploring. A key KPI set by the team was to increase Indeed's unaided consideration amongst 18 to 24-year-olds by 3% by the end of 2023. The team conducted comprehensive qualitative and quantitative research, which included focus groups, concept testing, over a hundred qualitative interviews, and a thousand projectible responses to the team's national survey. During a creative summit, it was discovered that Gen Z doesn't want to be told how to get a job, they want to know they're not alone. Additionally, it was discovered that most competing job sites push jobs for what they are, and not for how the target audience feels about them. By speaking directly with the target audience, an insight into a way to create a new tone surrounding the search through what would then become the foundational strategic idea: whether searching for your first position, or latest career move, Indeed allows you to search and apply for jobs comfortably, effectively, and on your own terms. Although the audience felt unseen by the job search process, it became an opportunity to reach them from an honest, empathetic, and reassuring perspective. All of these insights culminated in the team's big idea, No One Really Knows. The rationale: From the outside perspective, we all think everyone has it figured out. Why don't we break this misconception and approach the process with the walls down? No one really knows, but Indeed will help you find your answer.

Biochemistry and Molecular Biology

1. Bioprinting Novel Microgel-Based Pastes to Create a More Tunable Bioinks

Presenter(s): Hatte Hamilton, Anne Marie Santich

Advisor(s): Dr. Andrew Lyon

This project is focused on the development of optimized experimental parameters for the bioprinting of ultra-low crosslinked (ULC) pastes and ULC paste/GelMA composite inks. The aim of this experiment is to create a more tunable bioink with physical characteristics that can be altered through changing different parameters. ULC microgels, which is what ULC pastes are made from, have demonstrated tunable physical characteristics through variables such as temperature, making them a key interest of this project (Bachman et al., 2015). We proposed that by using these materials in the development of bioinks that the porosity and printing fidelity could be modulated; these are two significant areas of investigation in the larger field of bioprinting (Zhang et al., 2018). Creating a more tunable bioink would aid greatly in the field of regenerative medicine, for it would allow for more fine-tuned and controlled cell proliferation and tissue remodeling. Future directions will focus on using microgel composite bioinks for scaffold development.

2. Time Resolved Fluorescence of Dissolved Organic Matter and Oil Products in Natural Waters

Presenter(s): Christopher Sanchez

Advisor(s): Dr. Warren de Bruyn

The optical properties of chromophoric dissolved organic matter (CDOM), the UV and visible light-absorbing component of dissolved organic matter (DOM), have been used extensively to determine levels, distributions, identify sources, and track transformations of DOM in natural waters. Traditional optical techniques are primarily based on steady-state absorbance and steady-state fluorescence measurements. For example, three-dimensional excitation and emission matrix (EEMs) fluorescence spectra have been used extensively to characterize CDOM in these systems. One of the challenges in interpreting EEMS is that fluorescent material from different sources can fluoresce in the same region. For example, both terrestrial organics and oil products can fluoresce in the protein region of a typical EEM. Time resolved fluorescence spectroscopy has the potential to differentiate between these different fluorescent materials. Steady state and time resolved fluorescence measurements have been carried out on a range of natural dissolved organic water samples and a range of oil products to test the viability of using time resolved fluorescence spectroscopy to better characterize dissolved organic matter in natural waters.

Biological Sciences

3. Investigating The Morphology of Different Species of Hagfish Eggs

Presenter(s): Caroline Gallagher

Advisor(s): Dr. Douglas Fudge

Hagfish are benthic marine animals, in which reproductive behavior and methods are unknown. Females lay unique eggs with anchor filaments protruding from the two poles of the main egg capsule. These structures allow the eggs to attach themselves to each other. To further study the mechanics and morphology of hagfish egg structure and attachment, Micro-CT scans of several different species of unfertilized eggs were taken. These scans were analyzed using the software 3D Slicer to recreate the Micro-CT scan images and closely analyze the structures of hagfish eggs. These scans were also used to create various scales of 3D printed models to further examine attachment and the attachment structures. We reported observations of anchor filament diameter, filament stalk diameter, and patterns of attachment on both poles.

4. Exploring the Impact of Assessment Question Framing on Undergraduate Biology Students' Affect, Identity, and Visualization

Presenter(s): Noelle Clark

Advisor(s): Dr. Jeremy Hsu

In college biology courses, exams and quizzes are often used to assess students' knowledge. Here, we explore how different wording of assessment questions (i.e., how experiments in the question are presented) impacts students' attitudes, STEM identity, and visualization of the question. Past work from our group has revealed that different framings of isomorphic questions may cause large differences in student affect. However, such work has been limited to surveys. To investigate further, we interviewed students in a molecular biology class. Participants were given three isomorphic questions that varied who conducted the experiment: one version used authentic scientist names, the second used classmate names, while the third used the self-referential 'you' to place the student in the experiment. After each question, we probed students' attitudes, visualization ability of the question, and ability to relate to the subject. We identified emergent themes with open and axial coding.

Most students indicated they preferred the self-referential version and did not like the authentic question. Students cited a range of affective impacts depending on version. For instance, the students who preferred the self-referential version noted that there was a decreased cognitive load, and it was easier to visualize the experiment. In contrast, others found that being the subject led to a higher pressure to get the answer correct, which caused stress. Additionally, students who did not prefer the authentic version cited that they felt that they were intimidated by the excess information. Overall, we found variation in the versions that students preferred, and they mentioned a range of other affective and cognitive impacts, demonstrating that the framing of assessment questions can have a substantial effect on students' thinking. Our work provides new

insight into how the wording of assessment questions can impact students' attitudes and STEM identity.

Chemistry

5. Ester Hydroboration using Carbodiphosphorane and Superbase Catalysts

Presenter(s): An Dang

Advisor(s): Dr. Allegra Liberman-Martin

Carbodiphosphoranes are exceptionally electron rich because their central carbon contains two lone pairs. This project explores carbodiphosphoranes, other carbon nucleophiles, and superbases as catalysts for ester reduction reactions. A range of carbodiphosphoranes, phosphorus ylides, and superbases were compared as catalysts for caprolactone hydroboration using pinacolborane. A cyclic six-membered ring carbodiphosphorane was the most active catalyst. The hydroboration of a range of cyclic and acyclic esters and substrates containing multiple functional groups by the cyclic carbodiphosphorane catalyst is currently being studied.

Communication Studies

6. Parasocial Relationships Effects on Social Relationships

Presenter(s): Juliette Marneau, Talya Malka, Amelia Nathanson, Etta Lauchland, Leean Suleminian

Advisor(s): Dr. Rebecca Forster

Our study tests how individuals' social relationships are influenced by their current or past parasocial relationships. A parasocial relationship is a relationship and connection you feel with someone on social media that you have not met in person and they do not know you. We will be testing two hypotheses, the first being that individuals who are prompted to think about their parasocial relationships are less lonely, than people who are prompted to think about their romantic social relationships. The second hypothesis posits the satisfaction level in romantic social relationships, when prompted to think and not to think about their celebrity crushes. Both of these statements are interrelated and demonstrate how parasocial relationships and celebrity crushes heavily influence satisfaction levels in romantic social relationships. We plan on testing our hypotheses through an experiment in which participants will be randomly divided into three groups. Each group is prompted to think about a different relationship: parasocial relationship, social relationship, and nothing. Everyone will be required to take the first scale of the UCLA Loneliness Scale (version 3), those prompted to think about their social (romantic) relationship will go on to take the second scale, the Hendricks Survey & Scale, and lastly those prompted to think about their parasocial crush will take the third scale, the Adolescent Romantic Parasocial Attachments scale.

7. Color-Blind vs. Conscious Casting in Film: How It Relates to Attitudes Towards Media Diversity

Presenter(s): Evelyn Sechrist, Alesia Orta, Peri Woolridge, Kari Lien, Malik Graham

Advisor(s): Dr. Rebecca Forster

Our study is about the importance of media diversity with the intention of how filmmakers create a story. The film industry is evolving and diversity is an important topic of how directors can become more conscious of the cast being presented to viewers. We analyzed two approaches to casting: color-conscious and color-blind casting. Color-blind casting is when an actor is chosen for the role without the consideration of their race or ethnicity. Whereas, color-conscious casting takes the actor's race into account and changes the dynamic of the role. The first hypothesis is viewers have a positive attitude toward media diversity when movie characters are color-consciously casted rather than color-blind casted. Our second hypothesis states, viewers have a greater intention of watching a film that color-consciously casts their characters than characters that are color-blind casted. Our rationale states that viewers may personally relate more to characters that are color-consciously casted because this type of casting is inclusive and provides authentic representation, resulting in a more positive attitude toward the specific media. To test the hypotheses, we plan on conducting an online experiment where participants are randomly assigned to read either the color-conscious or the color-blind questionnaire.

Computational Science

8. Alzheimer's Disease Detection based on Magnetic Resonance Imaging

Presenter(s): Dylan Inafuku, Rahul Sura

Advisor(s): Dr. Yuxin Wen

This research project aims to improve early detection of Alzheimer's disease using deep learning and magnetic resonance imaging (MRI). We investigate whether integrating numerical patient data with MRI images through early fusion can enhance Alzheimer's disease classification accuracy. Alzheimer's disease is a significant public health concern, and early detection is crucial for effective treatment and management. Prior research has shown the promise of deep learning models in Alzheimer's diagnosis, particularly with MRI data. This study builds on previous work by exploring the integration of numerical neuropsychological evaluation scores (e.g., ADAS11, ADAS13, ADASQ4) alongside MRI images for more accurate classification. We utilize a supervised transfer learning model (ResNet50) pre-trained on ImageNet and the Alzheimer's Disease Neuroimaging Initiative (ADNI) dataset, which contains both MRI images and numerical patient data. Early fusion combines these data modalities, allowing the deep learning model to jointly consider both image and numerical information. Initial results with the model based solely on MRI images yield a suboptimal 50% accuracy in Alzheimer's disease classification. However, integrating numerical data through early fusion results in a remarkable accuracy of 96%. This highlights the critical role of data fusion in enhancing the model's predictive capabilities. In conclusion, this research demonstrates that early fusion of numerical patient data and MRI

images significantly improves Alzheimer's disease classification accuracy, offering the potential for earlier and more precise diagnosis, leading to better treatment planning and improved outcomes for Alzheimer's disease patients.

Computer Science

9. Alzheimer's Disease Progression Prediction based on Magnetic Resonance Imaging

Presenter(s): Rahul Sura, Dylan Inafuku

Advisor(s): Dr. Yuxin Wen

This research project, conducted under the guidance of Dr. Yuxin Wen, aimed to develop a robust machine learning (ML) model for predicting the progression of Alzheimer's Disease (AD) utilizing multi-modal data encompassing numerical, image, and categorical inputs. The central research question addressed was whether integrating diverse data types could enhance the accuracy of AD progression prediction. Drawing upon an extensive preliminary analysis of prior initiatives in the field, this study built upon existing ML models targeting AD prediction. Leveraging the Alzheimer's Disease Neuroimaging Initiative (ADNI) dataset, comprising comprehensive information from over a thousand individuals, including multi-slice MRI scans and over 80 numerical/textual features per patient, formed the cornerstone of our methodology. The implementation strategy involved the creation of distinct models tailored for image and numerical data. Notably, we employed transfer learning for the image model, repurposing a pre-trained ML model trained on a large corpus of paintings for object classification and adapting it for MRI data analysis. A pivotal aspect of our approach was the utilization of "early fusion," a technique merging data at the outset of the model rather than integrating outputs from separate models. The expected outcomes of this research endeavor hold significant promise for advancing our understanding of AD progression prediction. By capitalizing on the synergistic benefits of multi-modal data integration, this study seeks to contribute to the refinement and enhancement of predictive models in the field of neurodegenerative diseases. Furthermore, the adoption of transfer learning for image data analysis represents a novel application with potentially broader implications in the domain of medical imaging and diagnostic methodologies.

Dance

10. The Dancer's Unspoken Superpower: Consciousness of Mind & Body

Presenter(s): Mandy Fang

Advisor(s): Julianne Pedersen

"Dancing is visceral, but it is more than just physical," my jazz professor Steven Sofia likes to say. Dancing is an art of multitasking; it's interdisciplinary in that it is physically, but also mentally overwhelming on a dancer's conscious mind. Psychologically, dancers can be more efficient in how they approach training, but there's a lack of prioritizing the conscious connection between

mind and body in the dance community. So, what mindfulness tactics can contemporary dancers utilize to most efficiently bridge their conscious mind with their physical body? Made possible with funding from the Center of Undergraduate Excellence, I attended Alonzo King Lines Ballet's 3-week pre-professional summer intensive program in San Francisco where I trained with top choreographers whilst researching non-physical exercises that dancers can incorporate in their rituals as concrete methods of shifting into a "dance mindfulness." The long 6-hour days going from rigorous technique classes to stressful rehearsals were the ideal playground to experiment with warm-up tactics. During this introspective process, I discovered a culmination of mindfulness practices including yoga flow, deep breathing, affirmations, and intentional rest were most effective. Prior to a physically-taxing rehearsal, my body didn't just need an elaborate physical warmup, but rather deep breaths partnered with affirmations like "I am strong, I am in control of my body" tremendously primed my body. The key to accessing my fullest physical potential was actually through prioritizing my mental wellbeing and building somatic awareness. As the mental mind is very rarely paid regards to within dance, this research has proven that dancers need to be prioritizing their mental body as much as their physical body.

English

11. Queering Fairytales: A Study in Transformative Retelling

Presenter(s): Jade McDonald

Advisor(s): Dr. Julye Bidmead, Dr. Jan Osborn

In this project I will analyze a number of traditional fairy tales including Sleeping Beauty and Beauty and the Beast through a radical queer theoretical lens, drawing from theories including Michel Foucault's panopticism, Adrienne Rich's compulsory heterosexuality, and Judith Butler's gender performativity. These ideas developed within the field of queer theory reveal a great deal about the social norms we live under and how oppressive they can be for everyone, not merely those who identify as queer or who live in opposition to these norms. The primary form of analysis will be retellings of these tales that utilize a self-aware meta narrative voice to criticize the problematic aspects of the original versions while also exploring new, transgressive ways of valuing the experiences of queer people.

12. Kālī the Monstrous Mother

Presenter(s): Arianna Tan

Advisor(s): Lauren Sieberg

Death and feminism—what do those two things have in common? In Hindu mythology, these concepts point back to the goddess of death and destruction, Kālī. Kālī first appeared in 6th-century CE Sanskrit texts and is studied today as a feminist influence. Originally, her existence was to rope in the human understanding of the universe during early times; her stories and nature reflect the idea of chaos and disorder, challenging the very existence of dharma. She appears in various tales that range from mythological epics to fables that preach peace over vengeance. She

is depicted as a blue-skinned warrior with bloodstained hands and a lolling tongue, yet she may also appear as a gentle, light, motherly figure. Some worshippers may participate in rituals to seek salvation, while others turn to her for comfort. Though monstrous, people still look up to her as a guiding light because of her power, her ferociousness means she can protect and discipline like a parent, and she breaks the stereotype of the self-sacrificing wife. Early poets and modern researchers have studied Kālī through various lenses and have drawn many different conclusions about her. Kālī can be summed up with the phrase “she is this, but she is also that,” which mirrors our understanding of life’s end. In short, Kālī is an extremely multifaceted individual. This presentation aims to delve into Kālī’s many appearances throughout scholarly literature and present it in a digestible format for all audiences. Ultimately, it will help answer the question: how does the worship of a feminist icon help us understand a fate beyond our comprehension?

Environmental Science and Policy

13. Relationship Between Arsenic Bioaccessibility and Particle Size Under Gastric Conditions

Presenter(s): Ratish Ragavendiran

Advisor(s): Dr. Christopher Kim

California has generated vast amounts of mine wastes due to its extensive mining history. Within these mine wastes are elevated levels of several trace elements, including arsenic (As). Although regulatory agencies use bulk As concentrations to determine exposure risk, simulated gastric fluid (SGF) extractions represent a more physiologically relevant metric by which to assess As bioaccessibility and potential exposure. Additionally, other crucial characteristics that control As bioaccessibility, like particle size, are not typically considered when assessing and estimating exposure risk. Understanding how particle size plays a role in bioaccessibility can help better understand what are potentially dangerous mine sites and how to better deal with them. Processed mine tailings and unprocessed waste rock from six former mine sites in the Mojave Desert region were physically sieved into 11 discrete size fractions, with each fraction then analyzed for initial As concentration before subsequent exposure in vitro SGF. Arsenic bioaccessibility at each site, expressed as the percentage of As released in SGF, was moderately correlated with particle size. When As bioaccessibility was expressed in terms of concentration of As released in SGF, there was a moderate to strong correlation with particle size. Additional factors can account for the variability in results including reactive surface area, initial As concentrations, and water solubility.

14. Ecological Factors that Affect Nudibranch Presence in Tidepools

Presenter(s): Micah Kim, Lorena Muñoz

Advisor(s): Dr. Richelle Tanner

Nudibranchs, a species of sea slugs belonging to the Mollusca phylum, can be found worldwide along the coast. Climate change has caused a rise in ocean surface temperatures globally, along

with an increase of extreme weather patterns, directly affecting many coastal animals including nudibranchs. These changes in temperature from climate change have led to nudibranch population booms along the coast of Southern California, which has increased the interest of many within the scientific and general community. Despite this renewed interest, very little is known about nudibranchs and their physiology and behavior, especially regarding their heat tolerance and thermoregulatory behavior. To address potential thermoregulatory behavior, we investigated ecological factors that affect the microhabitat selection of nudibranchs in tidepools across the coast of Southern California. We used ImageJ to calculate the circumference of 20 tidepool images from each of the ten locations. Depth and temperature were measured in the field. We also characterized microhabitats in the intertidal zones by measuring the presence of invertebrates and seaweeds to determine if they had any impact on the presence of nudibranchs. We found that tidepool depth and circumference was significantly correlated with nudibranch presence, but not temperature. We expect to see the presence of sea urchins and hermit crabs to negatively impact nudibranch presence, but the presence of seaweeds with higher thermal inertia to positively impact nudibranch presence. Altogether, we have produced data to eventually create the first predictive model for nudibranch presence in warming tidepools, which is both useful for fundamental science research and for hobbyists seeking these animals on our coasts.

15. Behavioral Thermoregulation Under Chronic and Acute Heat Stress in Intertidal Nudibranchs

Presenter(s): Lorena Munoz

Advisor(s): Dr. Richelle Tanner

Scientists and amateur tidepoolers alike have noticed an anecdotal increase in nudibranch abundance and an expansion of their geographic distribution in California in recent warm years, but little is known about why and how nudibranchs are thriving in present conditions. Our previous work has shown that there is a physiological trade-off between heat tolerance and the ability to rapidly increase heat tolerance through acclimation. These species coexist in the same tidepools, which led us to ask: are there behavioral mechanisms at play in microhabitat use that distinguish nudibranch species' thermal tolerance (i.e., do some nudibranchs seek thermal refuge and other use biochemical strategies to mitigate heat stress)? We collected intertidal nudibranchs from sites across Southern California to characterize their thermoregulatory behavior in the context of climate change-induced warming and extreme heat days. Nudibranchs were acclimated to cool and warm temperatures for two weeks and subsequently placed in simulated hot and cold tidepools for two days, representing chronic and acute heat stress. Nudibranchs in the warmer chronic acclimation temperatures were more likely to engage in escape behaviors (i.e., floating on surface tension) but nudibranchs in the acutely hot tidepools were less active and less likely to float than in cool tidepools. Because nudibranchs are more abundant during warm periods, understanding the interplay between physiology and behavior for nudibranch species may serve as an indicator of intertidal community health under climate change scenarios.

16. Projecting California Water Supply and Demand Under Different Scenarios

Presenter(s): Citlalli Madrigal

Advisor(s): Dr. Thomas Piechota

California's water system comprises multiple units that make up supply and demand from the 10 individual hydrologic basins that form the water budget for the entire state. Water budgets are an accounting of the flow of water in and out of a water system that balances out, which when compared through time can be used to evaluate change in use and supply as a total. Our goal in this research is to make this information comprehensible or accessible to all those wanting to understand changes in the water cycle of California. This is performed by evaluating different scenarios and various components which make up the state's water budget, such as urban uses, and supply from Federal projects, to create potential scenarios that California water may face in the future.

The different hydrologic units are subject to changes through time and due to events such as climate change and population growth. Though future water situations can not be fully determined, historical data can give insight into future scenarios that can be expected through an interactive tool that makes it easy to interpret and use. To generate information on the effects of different scenarios that could affect supply or use, ten-year historical data is made into a baseline that is used to calculate change over time based on a percentage that corresponds to a category of either in supply or use to create a visual representation of the change over 20-year time increments. The generated visuals give a perspective of how impactful changes in the different categories can have on California water as a whole. Applying projections from different climate scenarios and expectations made by state and federal reports gives a better perspective of our water systems and the expectations from a water supply standpoint. Creating this tool explores the components of the California water budget that can benefit those wanting to further educate themselves on the moving factors and a perspective of how water will be affected by concerning events.

History

17. Dixieland in Brazil: Confederate Descendants in the American Diaspora

Presenter(s): Jordan Robbins

Advisor(s): Dr. Jeffrey Koerber

My senior thesis "Dixieland in Brazil: Confederate Descendants in the American Diaspora," canvasses the cultural exchange that took place between Brazilian natives and Confederate immigrants in the years following the American Civil War. Roughly 20,000 Confederates fled to Brazil with reasons ranging from their anger and frustration after losing the war to reports of high soil fertility and cheap acreage in South America offering the hope of economic success. Still others responded to advertisements taken out in Southern papers by Brazilian Emperor Dom Pedro II enticing Confederate immigration to a country that continued to uphold slavery. Although their motives varied, Southern immigrants, or Confederados as they became known as in the

Portuguese-speaking nation, arrived in record numbers. Once in Brazil, they created a distinct culture merging Brazilian and American values that has maintained a measure of its independence from the greater Brazilian culture to this day. This paper will focus on the cultural exchange that took place between 1865 and 1900 in Brazil between the Confederados and Brazilian natives. What circumstances allowed for Confederados to not only maintain a culture rooted in the American South, but to also inspire change within Brazilian culture at large? What role did religion play, given that Confederados were Protestants in a historically Catholic country? My thesis is based on research conducted at Auburn University through their Confederados special collection, specifically correspondence between the Hall, Norris, Steagall, and Taylor families who created and settled in various colonies throughout Brazil.

Interdisciplinary

18. Analysis of Lattice Structures through Fused Deposition Modeling Manufacturing of Thermoplastic Polyurethane

Presenter(s): Matthew Shugarte

Advisor(s): Dr. Nicole Wagner

After rapid advancements, 3D printing technology has caught the eyes of biomedical experts. 3D printers can precisely and quickly manufacture specimens capable of aiding the biomedical field through many applications. The focal point of recent biomedical related 3D printing research is the study of unit cell based structures, lattice structures, and their behavior under varying types and levels of stress, done through a 3400 series Instron Tensile Tester. This work focuses on three ASTM-standard lattice structures modeled with calculus-based mathematical methods and Fusion360 and manufactured with a flexible and versatile material, Thermoplastic Polyurethane, TPU, and through a reliable and accessible method, Fused Deposition Modeling, FDM, via a Prusa i3 MK3S printer. The cyclical tensile tests display nonauxetic based lattice structures exhibiting a higher elastic modulus than the auxetic based structure, therefore tolerating higher levels of force and stress than auxetic based specimens. However, the auxetic specimens demonstrate higher ultimate strength. Hence, these studied auxetic structures degrade at a slower rate than the nonauxetic specimens. The three point bend tests and cyclical compression tests convey similar results. However, these tests also share the observation that the auxetic specimens displace more from their initial positions when compared to the nonauxetic specimens. This data and these observations suggest that auxetic based lattice structures perform best in low stress and high endurance applications due to their elastic modulus and ultimate strength. The nonauxetic specimens are ideal for high stress and low endurance applications. These conclusions convey the potential for each of these specimens within the needs of any 3D printing application in the biomedical field.

Mathematics

19. An Evaluation of California's Newly Proposed K-12 Mathematics Curriculum

Presenter(s): Erin Babbitt

Advisor(s): Dr. Mihaela Vajiac

Due to California's poor mathematical performance, the CA Department of Education released an over a thousand-page document outlining shifts in curriculum and pathways, which we have examined in this project. The standards have been highly criticized as they fail to realize the repercussions the proposed pathways will have on students, particularly those who want to go into STEM fields. The California Department of Education set about this project to both increase California's performance in mathematics and to attempt to close the achievement gap in math. In this project, we will show how their dependence on pre-college students' knowledge of their future careers is incredibly misguided. We will also show how their new pathways will be a further gatekeeper to minorities in advanced mathematics and how these will leave the truly gifted mathematicians bored in courses far below their abilities. Moreover, we will show how a previous attempt at some of these proposed changes in San Francisco found it had no statistical effect on raising minority enrollment in advanced mathematics. Based on our examination of the documents and research into curriculum models of other states and countries, we will propose improvements to the CA Mathematical Framework that will allow it to achieve its goals without adversely affecting our students.

Music

20. The Truth in Beauty: An Introduction to the History and Contemporary Writings on Music Philosophy and Aesthetics

Presenter(s): Alana McKinnon

Advisor(s): Dr. Jessica Sternfeld

Music philosophy is a branch of Western philosophy that discusses and analyzes the purpose of music; music aesthetics is a sub-topic within this that regards the nature and beauty within music. It is a topic that has been seldom discussed, but what has been written is dense and meaningful. As the 20th century progressed, music philosophy and aesthetics became more prevalent. First tracing a brief history into this realm of philosophy, this essay explores ideas on what music is, its significance, and its influence on people, spanning from Antiquity to the late-Romantic period. Upon reflection, we delve into the heart of this topic, which is what some of the most well-known scholars in music philosophy and aesthetics have written and discussed. Such scholars are Roger Scruton, Jerrold Levinson, Peter Kivy, and Stephen Davies. Through investigation into these writings, we discover the importance of music: how it is possible to reflect one's emotions and his or her innermost being and how this crucial aspect indicates a necessity for goodness and

beauty within it. The result is a reflection and an insight into the culture of that time: what are that culture's values, and do they reflect an objectionably good society?

21. Silence Overwhelmed: Investigating the Award-Winning Sound Design of Outer Wilds

Presenter(s): AnneMarie Okuhara

Advisor(s): Dr. Jessica Sternfeld

Why do video games feel so hollow when we mute the TV while the rest of the house is asleep? How can this lack of game audio be minimally yet strikingly noticeable at the same time? This work is a body of research surrounding the crucial sound design of Outer Wilds, the 2019 multi-platform video game created by Alex Beachum. It presents the argument that the sound design is an integral factor to the game's reception of the renowned 'Game of the Year' Award in 2021, more specifically that Mobius Entertainment would not have earned this award if not for its captivating audio space. To supplement the research and provide accessibility, this work also gives a brief technical overview of sound design for video games and some key titles that pioneered virtual audio spaces and inspired the developers of Outer Wilds. As a body of research centered around one specific artwork, this paper will also detail the gameplay aspect of Outer Wilds in heavy relation to its object-based spatial audio environment, organized chronologically by the approximate predetermined path of the average player. This portion of the research is purely interpretive and subjective, but is still supported by a large community of players. While no two gameplay experiences are the same, these conclusions are supported by large consumer audiences, interviews with the developers, and academic research works of other media that are strongly connected to Outer Wilds.

22. Musical Medicine: How Music is Used for Healing

Presenter(s): Crimson Bray

Advisor(s): Dr. Jessica Sternfeld

Music has been used for healing purposes and valued for its healing properties all across the world in a variety of contexts. Back in the days of ancient Greece, philosophers and doctors were able to recognize the benefits of music in the mind and soul; Pythagoras was a professor and polymath who prescribed musical modes and scales to treat specific mental and physical ailments. Our brain processes music in many intricate ways that add to our cognitive abilities and emotional wellbeing. Music can even aid in the development and maintenance of brain health, such as by preserving memories associated with music in those with Alzheimer's disease, reducing depression and anxiety in those with mental illness, and increasing emotional regulation skills. Music therapy is a rapidly growing field that uses music in a clinical setting in order to reach specific physical or mental health goals. But even outside of the medical field, music has a plethora of benefits that we utilize all the time. In everyday life, we may turn to music when we need to process emotions, whether they be positive or negative. If we are in a relationship, we might make a love playlist to make our partner smile. If we've been broken up with, we might

turn on some sad Taylor Swift songs to cry to. Music is often used in a variety of social settings, from elevators to restaurants, to foster certain environments and provide people with certain effects. For many people, music is not just a casual affair; many religions, such as Hinduism and Buddhism, as well as modern-day Western spirituality, incorporate musical instruments and pitches/frequencies into their practices and are believed to heal the mind and soul. This project displays the variety of ways music serves positive effects in regards to healing and rejuvenation.

23. Analysis of Iron Gall Inks as a Technique to Investigate pre-20th Century Musical Works

Presenter(s): Dhivya Manickam

Advisor(s): Dr. Jessica Sternfeld

During the 15-19th centuries, one medium of inscribing prevailed as the top contender for artists of all types: Iron Gall Ink. Musical composers, who continue to be frequently listened to and performed today, used Iron Gall Ink to sketch their original manuscripts because of its permanence once exposed to air. Unfortunately, this type of ink rapidly deteriorates despite conservation efforts. Further analysis is warranted to prevent the loss of these precious artifacts and the information they can provide, without permitting damage. Non-invasive chemical analysis of Iron Gall Inks is a promising field that can reveal information about compositional processes and other debates surrounding musical works. The merits of two such techniques, micro-X Ray Fluorescence and Raman Spectroscopy, are established in determining the composition chronology of works by Mozart and Chopin. Ongoing authorship debates in musicology, such as those concerning Mozart's posthumous works and a Tempest opera, are highlighted for their potential to be resolved with ink analysis. Until recently, authorship and authenticity debates have been discussed primarily using historical knowledge and visual analysis. Rather than speculating on controversies with disputable information, chemical analysis should be considered a principle quantitative method. In addition to settling discourse, ink analysis can also aid in the documentation of the current state of manuscripts before further deterioration, contributing to the conservation of all written arts.

24. What's Your Hip-Hop Story?: How Authenticity has Simultaneously Fought and Imposed the Commercialization of Rap

Presenter(s): Heather Ulwick

Advisor(s): Dr. Jessica Sternfeld

How did rap go from one of the most historically scrutinized genres of music, to being the most highly consumed in the United States and UK? Simply put, over the past two decades the world of rap has evolved into a space that nurtures and rewards true creative self-expression. This expression allows wider audiences to resonate with the music because the authentic narratives presented are diverse enough for the masses to consume. The research presented will focus on four artists who have expanded this genre with their original perspectives: Kanye West, Kendrick Lamar, Drake, and Nicki Minaj. By highlighting how their dedication to "keeping it real" translates

to their commercial success even when this means going against the mainstream, and analyzing their discographies in relation to their self-portrayal in the media, this research will prove that the most well received rap music is born from truly authentic storytelling.

25. Miming Music: The Issue with Today's Live Performers

Presenter(s): Nathan Acupan

Advisor(s): Dr. Jessica Sternfeld

Audiences pay hundreds of dollars to encounter this sensation, finally singing the tune they have replayed countless times on their phone with their favorite artist. The conversational quality live performances embody between the performer and the listener can be a euphoric experience. However, the song you have been dying to hear live is not as authentic as you would think. With technology being more prominent in music production and the accessibility of creating music through online tutorials, the state of live performance is straying away from acoustic instruments and conventional presentation. The audience's preference has also evolved in correlation to the change in live performances. More concertgoers prefer a visually spectacular concert, with the musical production equivalent to the complexity of the record. Pop artists conform to the trends of the production value of performances, sacrificing the use of live instruments and live performers with prerecorded tracks. This paper will discuss the meaning of performing live in the pop style of music, as well as its evolution from its earliest occurrence of technology in live music to today's techniques, such as the utilization of click tracks, instrumental tracks, triggers, and auto-tune.

26. Music During Social, Civil, and Political Unrest: A Look Into the Protest Music of Northern Ireland

Presenter(s): Lauren Blue

Advisor(s): Dr. Jessica Sternfeld

Some of the most influential music and art have emerged during civil, social, and political unrest. Music, in particular, is a critical aspect of almost every culture, and protest music is even more influential because it can unify causes. The Troubles brought global attention to Ireland, and thus, many well-known artists released commercially successful songs on the topic. Musicians worldwide, including Paul McCartney, John Lennon, Elton John, The Cranberries, U2, and more, used music to react against the social injustice and violence in Northern Ireland. Other songs, like Tina Turner's "Simply the Best," became the anthem song for the Ulster Volunteer Force, and NWA's "Fuck the Police" for Irish Republican prisoners. While certain music is written for specific political purposes, most research shows that how music is interpreted or perceived is often out of the artist's control; a lot of music we view as "protest music" was not written with the intent of being a protest song. This research analyzes how and why music serves as a creative outlet for social protest, focusing specifically on the music that emerged from The Troubles in Northern Ireland from the 1960s to the 1990s and the global musical reaction to this civil unrest.

Pharmacy

27. Studying Astrogliosis in a Mouse Model of Tauopathy using NIH ImageJ

Presenter(s): Emi Iwasaki

Advisor(s): Dr. Rachita Sumbria Nataraj Jagadeesan Chuli Roules

Astrocytes are the main homeostatic regulators of the central nervous system (CNS) and perform crucial functions such as the modulation of synaptic activity and intrinsic neuroprotection to neurons. Astrocyte activation and reactive gliosis are associated with the progression of nearly all human neurodegenerative diseases. Astrogliosis appears to precede neuronal loss, suggesting an important causative role of astrocytes in the development of disease. The aim of the study was to investigate astrogliosis in a mouse model of tauopathy (PS19 mice) using NIH ImageJ. The brains of male and female wild-type (WT) mice (n=12) and PS19 mice (n=11), mice with the P301S mutation, were sectioned and stained for the glial-fibrillary acidic protein (GFAP), a protein marker for astrocytes, using an anti-GFAP antibody. Brain sections were imaged using a fluorescent microscope and NIH Image J software was used to quantify the percent positive area of GFAP in digitized images. Renyi Entropy was used as the thresholding method while using NIH Image J as it most accurately selected the stained GFAP across images. The quantification was performed over four weeks. Four sections from each mouse with five different regions of interest including the amygdala (AG), cortex, cornu Ammonis (CA) 1, CA3, dentate gyrus (DG), and the entire hippocampus per section were quantified. Mean GFAP percent positive area in the WT and PS19 mice were analyzed using GraphPad PRISM, and sex differences were also analyzed. Two readers blinded to the study analyzed the data. Our analysis revealed that GFAP percent positive area from the two readers yielded a high R-squared value of 97%, indicating a strong correlation between the readers. Statistical analyses revealed that the astrocyte burden in the brains of PS19 mice was significantly higher than in WT-control mice. This difference may be due to higher levels of hyper-phosphorylated tau in the brains of PS19 mice. In summary, the present investigation demonstrated the utility of NIH ImageJ in quantifying GFAP in mouse brain sections to assess astrogliosis.

Physical Therapy

28. Identifying the Effects of Function-based Exercise on Postural Stability and Gait in Patients with Parkinson's Disease

Presenter(s): Kasey Markell

Advisor(s): Dr. Rahul Soangra

This project seeks to identify a correlation between consistent, functional exercise and posture, balance, stability and gait in patients with Parkinson's Disease (PD). PD is a neurodegenerative disease that decreases levels of dopamine in the Basal Ganglia of the brain, resulting in symptoms such as excessive freezing or erratic, involuntary movements, ultimately affecting a person's

ability to ambulate safely and independently. This study consisted of three main approaches to build a firm base of knowledge for this field of research. The first component was to test the limits of stability in healthy individuals for a baseline comparison to people with PD. Next, a function-based exercise routine (the Functional Exercises for Balance and Step, also known as the FEBS routine) was developed specifically to reflect functional movements people with PD typically lose over time (based on literature and expert opinion). Finally, the utilization of motion capture technology was used to analyze gait, posture, and stability in both healthy and PD-diagnosed individuals to analyze differences in posture, gait, balance, and stability. The culmination of these foundational components were brought together in this study to first identify a significant disparity in healthy individuals and people with PD in terms of gait, postural stability, and balance. A secondary aim of this study is to use this data in future studies, for identification of how consistent functional exercises over a longer period of time can affect the posture, gait, balance, and stability of people diagnosed with Parkinson's Disease.

Political Science

29. The Pride Pipeline: Violent Nationalism in the United States

Presenter(s): Emily Veloz

Advisor(s): Dr. Ann Gordon

A striking rise in American Nationalism has emerged due to varying factors; however, a particular selection of identities have acted as primary contributors to this phenomenon. This piece navigates the increasing application of violence in the political arena in tandem with the impacts of racial, socioeconomic, and social factors that have fueled this collective aggression. Previous research points toward the hyperpolarization that has been perpetuated by political figures and media outlets, the augmentation of a psychological us-vs.-them mentality, and the perceived threat to American hegemony across the globe. Through an analysis of data provided by the 9th edition of the Chapman University Survey on American Fears in addition to a selection of the 6th edition, this phenomenon is dissected further. Extracting the responses to a given respondent's partisan affiliation and their individual consensus regarding the use of force to restore political power, this piece amplifies the present beliefs of scholars, adding the significance of recent resurgences in violent movements and extremist political groups. Upon examination of current data, it is proposed that while religious and social factors intersect uniquely to contribute toward the presence of violent patriotism, the most prominent factor is the growing belief of white supremacy and the perceived threat that marginalized groups pose to a white, Christian America.

30. Perception vs. Reality: The Influence of Lived Experience, Partisanship, and Media on Assessing National Security Threats in the United States

Presenter(s): Kimberly Gomez

Advisor(s): Dr. Ann Gordon

In this paper, I will explore the extent to which an individual's perception of national security is influenced by factors that derive from their lived experience. Utilizing the Chapman Survey of American Fears, a representative sample of U.S. adults, I found that partisanship, media, gender, and ethnicity affect how individuals perceive certain political and ideological groups as a threat to national security. Factors such as media and partisanship also affect why individuals classify certain political and ideological groups as extremists in comparison to others. I find this outcome is due to the increasing social and political divide in America which has caused a rise in political polarization. Moreover, there is a disconnect as to groups that the public perceives to be committing crimes as opposed to the groups who are actually committing crimes according to FBI statistics. Given that political partisanship is influenced by media and lived experience, these factors will determine an individual's perception of how right-wing extremist groups impact of national security. The disconnect between who the media perceives to be committing crimes versus the reality of which groups are committing the crimes reveals the broader implications of how American society views certain political and ideological groups negatively and further the political and social divide in the United States.

31. America's Fear of Civil Unrest Through the Lens of 2020 BLM Protests and January 6th

Presenter(s): Morgan Romine

Advisor(s): Dr. Ann Gordon

Over the past five years, the United States of America (US) has experienced events which highlight societal weakness and faults in the foundations of the US system. This research paper focuses on the level of fear a participant has of civil unrest in the US, how that fear has evolved following the events of 2020, including the January 6th Insurrection and 2020's summer of Black Lives Matter (BLM) protests. Factoring the age, political affiliation, and socio-economic status of the study's participants into the findings, is a way to understand where the participant's fear may be stemming from. My research uses the 2018, 2019, 2021, 2022, and 2023 American Fear Surveys conducted by Chapman University's Henley Lab. My analysis of the data from the American Fear Surveys indicate that younger individuals, Democrats, and those with lower socio-economic status tend to have greater levels of fear concerning civil unrest in the US. Moreover, analyzing the data from the American Fear Surveys and comparing it throughout the past 5 years, shows evidence of increased levels of fear following the events that transpired between the 2019 and 2021 American Fear Surveys, with my research focusing on the January 6, 2021 insurrection and the BLM protests in 2020. There is potential that a certain level of fear regarding potential civil unrest is expected in American society, due to America's democratic system and the accompanying civic duty of political and social activism. The findings of heightened fear following

the January 6th insurrection and the summer 2020 BLM protests might serve as a cautionary signal to America, suggesting that the current system may be faltering and require change. Additionally, the fact that younger and less socio-economically stable citizens are expressing this fear implies that systemic changes within our society may be on the horizon.

32. Implications of Corruption on Democratic Involvement in America

Presenter(s): Nikolas Janke

Advisor(s): Dr. Ann Gordon

In a democratic society, those who hold office often seek to maintain a positive public image in order to rally voter support, advocate for their political agenda, and maintain power over those within their nation; however, paradoxically, in American tradition, there has always been an implicit distrust for those with power. In this paper, I examine the factors that cause Americans to be fearful of corruption in and among government officials, and reveal the implications those fears have on American democratic involvement. Utilizing the Chapman Survey of American Fears—a representative national sample of U.S. adults—I discovered firm relationships between respondents' fear of corrupt government officials and their overall level of education, their level of income, and their voting tendencies. I then further my investigation by examining the historical origins of Americans' fears of corruption in governmental systems and analyzing their evolutions. By developing my findings, I am able to explore the real-world implications that the historical and present perceptions have on the overall behaviors of American citizens in the democratic process. The United States is frequently touted as the "land of the free," however it is crucial to understand why a significant portion of its citizens hold wary reservations concerning those put in charge of advocating for that freedom so that we may achieve a truly virtuous system. Through the insightful critiques offered and embellished in my work, I emphasize the importance of dissecting Americans' fears of political corruption—from past and present—and recognize the barriers that we as a nation must overcome in order to fulfill the democratic obligations of the future.

33. Media's Influence on the Public's Perception of Safety in America

Presenter(s): Roxanne Aguilera

Advisor(s): Dr. Ann Gordon

Power and fear are destructively powerful tools mass media utilize to influence news-consuming public perceptions of safety. Through agenda setting, framing events, sensationalism, and oversaturation, the media constructs an understanding of social problems to prioritize, misconstruing the reality of dangers. This paper examines the gravity of news and media outlets' influence on public perception of safety via news coverage of violent crimes and terrorism compared to the realities of these threats. This study draws from a nationally representative sample of the Chapman University Survey on American Fear to analyze the correlation between media mediums/consumption and fear of terrorism and violent crimes. My findings show similar results between studying 'the fear of terrorist attacks,' 'the fear of being a victim of terrorism,' and a constructed index on 'fear of violent crimes' among gender, education level, and race.

Females, less educated, and Hispanics were more likely to be afraid of both compared to any other. I found a stronger relationship between media mediums being the source of fear of terrorism. When factoring media mediums, daily social media usage was the strongest indicator of fear of being a victim. I found greater fear in younger generations when exposure to television increases. Ultimately, mass media can dictate the public's priorities and concerns, actively constructing enemies and shaping beliefs, attitudes, and general behaviors. Often, excessive exposure to a few specific threats to safety, specifically terrorism and violent crime mixed with political/elite agendas, limits the public awareness of actual immediate and impending problems, restricting the ability to respond and resolve – which is a danger in and of itself.

34. Party Identification and the Fear of Immigrants

Presenter(s): Tala Eisouh

Advisor(s): Dr. Ann Gordon

Immigration is a key part of American history and we have seen an increase over the past few years. With that, Americans fear the possible dangers that come with immigrants entering the U.S. The question I'll be answering is where this fear stems from. In this paper, I find a correlation between the fear of immigrants and party identification bias. Using the Chapman University on American Fear Survey, which surveys a thousand U.S adults nationally, has furthered my findings. The data shows the correlation between partisanship and anti-immigrant beliefs, along with their news sources which depict immigrants in a negative light, therefore influencing Americans to think the same and feel negatively towards them. I also examine that with the fears of economic collapse, people are more likely to fear immigrants. Along with that, people who are unemployed or financially unstable are also more likely to fear immigrants because they are worried about them taking their jobs. Because the U.S. prides itself as a great and free country, people are led to believe that welcoming immigrants isn't a problem, however it seems as though it is.

35. The Beast in the East: The Root of the American Fear of China

Presenter(s): Tyler Coker

Advisor(s): Dr. Ann Gordon

China is one of the world's most powerful nations, which is well-demonstrated by their explosion in economic activity and development. In this paper, I study the extent to which college education, media usage, and party identity impacts one's fear over China's economy surpassing the United States'. Using Chapman University's Wave 9 report from 2023, I found a link between individuals with no college education harboring more fear over the growing Chinese economy rolling past the American economy. Existing literature has looked into the causes of the fear of China, especially the impact of the media in growing fear of China. Education and party identity, however, are not looked into, and this paper will help explore what the root cause for Americans' fear of China is. My own approach, looking at polling results of Americans, tests the impact of education, party identity, and media consumption, as well as the relationships between the factors, in order to track down the root of Americans' fear. In my research, I also found that

Republicans harbor significantly more fear than any other political identity over China's growth. There is also a significant relationship between the consumption of FOX News and fear of China. The relationships found in this paper are significant in seeing how external factors can influence public opinion on China, which can have a consequential impact on American foreign policy. With economic strength having a relationship with foreign power, the growth of China's economy can create fear of growing Chinese influence abroad, which can continue to be escalated by educational factors, political parties, and mainstream media.

36. Fear of being Kidnapped/Abducted

Presenter(s): Dioska Miranda

Advisor(s): Dr. Ann Gordon

Fear of having a violent crime committed against us has made most individuals more cautious of their surroundings due to the unknown. This paper aims to determine whether there is a correlation between the amount of time an individual spends on the internet and the amount of fear an individual has of having a violent crime done to them. In this paper, I will answer the following research questions: Does gender play a role in who is most likely to have a greater fear of being kidnapped/abducted and committed against them based on the amount of time spent online? What is the role of social media platforms in new media, and whether the type of news consumption increases fear of violent crime? The data presented in this paper is gathered from The Chapman University Survey on American Fears (CSAF); I assume that the data set will show that women will be more fearful than men of having violent crimes committed like being Abducted/ Kidnapped, based on the amount of time they spend on the internet. The role of the internet plays a massive role in today's day; knowing the impact of the internet can help understand why more individuals are fearing being kidnapped/abducted.

37. Mass Media's Role in Priming American Fears of China

Presenter(s): Cole Cooper

Advisor(s): Dr. Ann Gordon

American citizens, whether they like it or not, are being primed and trained to think in specific ways about political issues mainly due to how frequently, where, and who they receive their daily news from. In this research, I have evaluated individuals' political party preferences and where they receive their daily news to help understand why certain Americans are fearful of China's influence abroad, China reducing United States power in the world, as well as how fearful they are of the Chinese economy taking over the United States economy. Using the Chapman Survey of American Fears, a nationally representative sample, I have observed a strong correlation between American citizens who receive political news from conservative news outlets and politicians who are generally more afraid of China's economy taking over the United States economy. Nearly 70% of Americans who watch Fox News daily are likely to fear China's economy compared to 26% of Americans who watch CNN nightly. Furthermore, my findings also showed that nearly 90% of individuals who identify as Republicans fear China's influence abroad

compared to 67% of individuals who identify as Democrats. By analyzing and understanding how different news sources and political party preference affects and prime Americans' fears, such as fears derived from China, we can better predict, analyze, and understand future American fears.

38. Relationship between US Immigrants and Party Lean

Presenter(s): Isabella Botero Cely

Advisor(s): Dr. Ann Gordon

The US is known for being a diverse mix of different cultures, ethnicities, and races, which is why immigration is such a crucial part of its success, dating back to the 1800s when the Irish arrived, to present day, where Asians, Latinos, Europeans, and more ethnicities live among each other. This paper will examine the relationship and correlation between persons who are Democratically leaning, and how likely this group is to fear immigrants. Using a data set that surveyed Americans on what they fear, or the Chapman University Survey on American Fears (CSAF), between 2014 and 2023, I will be using the wave 9 of this data set (2023) to prove or disprove my hypotheses through my paper. I found that the party identification does not always determine the same result when R is asked how afraid they are of immigrants. The relationship between the two variables is conservative, because the difference in percentage of fear level of immigrants between Democrats and Republicans is very slight. This paper will also dive into the other dimensions of the fear of immigrants and how they relate to other social and economic variables. Immigration is a healthy part of US society and economy, and therefore we should question the fear that certain groups of people feel towards immigrants, and how this is manifested into everyday actions on both the immigrant's side and the citizen's side.

39. American Democracy at Risk: An Analysis of Social Media Usage, Political Knowledge, and Hyperpolarization in Recent National Elections

Presenter(s): Elyse Crimmins

Advisor(s): Dr. John Compton

Research in recent years vaguely uncovers the implications of social media as news platforms and the relevant spread of disinformation on national politics. Literature has yet to be able to thoroughly quantify the scope of media influence on election cycle results and voting behavior. Through analyzing media consumption behavior on specific platforms and the trends of party polarization in recent national election cycles, this research aims to conduct a more informed view of the threat posed by political media content during and leading up to Presidential campaign cycles. This thesis delves into the consequences of this phenomenon, particularly its impact on voter participation and party ideology. Further, this study intends to conclude that narrow partisan media content has perpetuated the tendency for constituents to embrace a cult-like party mindset. The limited control of information voters receive threatens misinformation and allows for a growth of ignorance on varying issues. By promoting a tribalistic allegiance to one party or ideology, individuals may become less inclined to engage in constructive political discourse, compromise, or consider opposing stances on current political issues. With an analysis

of American National Election Study data, this research will expose the trends between media platforms and public knowledge. Voters can become more accurately informed and aware of the accuracy of their media consumption. Consequently, this study additionally explores how cult-like polarization can lead to political stagnation and hinder the democratic exchange of ideas.

40. The Professionalization of the Supreme Court

Presenter(s): Ruben Lopez-Apodaca

Advisor(s): Dr. John Compton

The professional and personal backgrounds of Supreme Court Justices are becoming increasingly similar. Nearly all sitting justices hold degrees from an Ivy league law school and have experience as federal circuit judges. In earlier periods this was not the case. The Stone Court of the 1940's had six Ivy League alumni and one judge with federal circuit experience. This begs the question, when and why did this shift take place? This study will provide an overview of the occupational and educational backgrounds of every justice from 1910 to the present, in addition to Supreme Court nominees of the same period that failed to reach the high court. The process of Supreme Court justices gradually becoming more homogenized in terms of qualifications is what this study classifies as the professionalization of the court. This study hypothesizes that as the Supreme Court nomination process became more politicized over time, presidents feared their nomination being rejected on the grounds of professional inexperience or lackluster education. Hence, justice qualifications become professionalized in a uniform manner. This paper will argue that the trend of professionalization of the Supreme Court began in the 1970's. Academics and non-academic alike will find this study interesting as it will provide context to the current court and possibly their partisan jurisprudence. In addition, it may predict what we expect to see moving forward with the court in terms of justices' education and employment qualifications. Lastly, we may be able to correlate court professionalization and the polarization of the Supreme Court Justice nomination process.

41. Fear of the Economic Future: A Demographic Analysis of its Impact on Voter Turnout

Presenter(s): Mateo Guerrero

Advisor(s): Dr. Ann Gordon

The financial aspirations associated with the American Dream motivate hopes of opportunity and prosperity, yet current opinions on whether many reach that financial stability and analysis of demographic factors may provide an insight into potential links to inequity and success. Using the Chapman University Survey of American Fears, a nationwide data sample of current fears across U.S. adults, I examine the extent to which demographic metrics link to current fears of financial uncertainty. In addition, I analyze how the disparity in current financial and economic fears impact voter participation. Adding to the discourse around the relationship between economics and politics, economic fears influencing disparities in political participation may stem from contemporary monetary policy and government legislation. These effects can drastically impact future results for the upcoming 2024 presidential election and more.

I find a moderately strong relationship between historically oppressed demographic groups and higher fear levels of financial uncertainty. My essay seeks to prove that economic fears among oppressed groups correlate with lower voter turnout by analyzing the theories of retrospective voting, sociotropic voting, and pocketbook voting. Although perfection across opportunities of equity is an unrealistic goal, implicit biases call into question the legitimacy associated with the American Dream, democracy, and its future.

Psychology

42. Triangulating Neural Correlates of Consciousness

Presenter(s): Sarah Quach

Advisor(s): Dr. Aaron Schurger

For decades, neuroscientists have been trying to find a plausible explanation for how our subjective experience could emerge from processes in the brain. Early work by Christof Koch and Francis Crick on the neural basis of consciousness argued that consciousness can be approached empirically by identifying the neural correlates of consciousness (NCCs). Past experiments attempted to identify the NCCs using common manipulations like backward masking to interfere with conscious perception. Although the use of this method suggests many different candidate NCCs, in theory using any one manipulation alone to identify the neural processes that define consciousness is limited. It becomes difficult to determine which candidate NCCs are specific to the manipulation, and which are general properties of consciousness. The primary aim of this project is to identify more generalizable NCCs, by using a different and more innovative approach: the “triangulation” method. Using electro-encephalography (EEG) to record brain data, this approach will compare the results of three different manipulations of visual perception: backward masking, dichoptic color fusion, and inattention blindness. By triangulating across the three manipulations, we will assess the overlap in putative correlates in response to the very same visual stimuli and in the same human subjects. In particular, this specific project will focus on the representational stability of neural responses to sensory stimuli as a candidate correlates to classify data from individual trials as “seen” or “unseen.” The data will provide us with a unique assessment of the overlap among NCCs and allow us to identify NCCs that triangulate across all manipulations of visual perception. Using data-driven machine-learning analyses, the triangulation approach may lead us one step closer to identifying the genuine neural correlates of conscious visual experience.

43. The Negative Impacts of Workaholism on the Physical and Psychological Well-Being of University Students

Presenter(s): Brian Walker

Advisor(s): Dr. John Hunter

In recent years, there have been tremendous pressures in the workplace that have led to the increased prevalence of a phenomenon referred to as workaholism. Undergraduates may be placed under similar, if not greater, pressures than those in the workforce and might be experiencing negative psychological and physical effects of workaholism. To determine the relationship between workaholism and well-being among undergraduates, 440 demographically-diverse college students were surveyed through Prolific. Linear regression analysis determined that workaholism significantly predicted higher rates of depression ($b = 0.29, p < .001$), anxiety ($b = 0.46, p < .001$), stress ($b = 0.31, p < .001$), burnout ($b = 0.42, p < .001$), negative affect ($b = 0.35, p < .001$), as well as lower rates of positive affect ($b = -0.26, p < .001$) and poor health ($b = 0.84, p < .001$). These findings demonstrate that workaholism impacts both psychological and physical health in undergraduate college populations. This association may serve as a foundation for the development of novel interventions that may lessen negative impacts of workaholism on the well-being of college students.

44. Exploring the Dynamics of Self-Esteem and Blood Pressure: A Cross-Sectional and Longitudinal Investigation

Presenter(s): Bijou Allard

Advisor(s): Dr. Julia Boehm

High self-esteem is linked with positive outcomes, including better relationships, work performance, and mental health. However, less is known about the relationship between self-esteem and cardiovascular health. This study examined the relationship between self-esteem and blood pressure cross-sectionally and longitudinally. We hypothesized high self-esteem would be associated with lower systolic and diastolic blood pressure concurrently and ten years later. Participants came from the Midlife in the United States (MIDUS) study (Mage = 55.38; 58.1% women; 15.5% Black). Self-esteem was self-reported using the Rosenberg Self-Esteem Scale. Systolic and diastolic blood pressure were assessed using an average of three measurements taken during a physical exam. Cross-sectional analyses were based on $N = 1,081$; longitudinal analyses were based on 546 participants who completed a follow-up physical exam and were stratified by the use of antihypertensive medication. Linear regression analyses found no cross-sectional or longitudinal associations between self-esteem and systolic or diastolic blood pressure ($p > .05$). Results suggest high self-esteem is not associated with lower blood pressure among middle-aged and older adults. Given that cardiovascular disease is the leading cause of death, there is a need for further research into the relationship between self-esteem and cardiovascular outcomes.

45. Investigating the Causal Role of the Motor Cortex on Breathing and Volition

Presenter(s): Raniyah Chishti, Lucas Jeay-Bizot

Advisor(s): Dr. Uri Maoz, Dr. Aaron Schurger

Can physiological signals play a role in movement-onset? Previous research suggests the initiation of a movement is coupled with the phase of respiration that we are in, explicitly stating that we are more likely to be in the expiration stage of breathing when initiating a movement rather than the inspiration stage. This study aims first to replicate previous results to find if this coupling exists and second to disrupt the neural sources of these signals to find which brain regions are at the interplay between respiration and free movement.

Using theta burst stimulation (TBS; repeatedly stimulating using a focal magnetic field, a brain region to lower its excitability temporarily) and respirometry (the measurement of respiration), we disrupted the neural sources of the brain's electroencephalographic signals associated with motor-function-based decisions and analyzed whether the expected respiration cycles remain consistent before and after the disturbance. The two regions stimulated were the primary motor cortex (M1) and the supplementary motor cortex (SMA). We had fifteen participants who completed one hundred trials of a standard self-initiated movement task before and after stimulation - which were then compared to ascertain each region's role.

Overall, we succeeded in replicating the coupling phenomenon found in previous studies, which indicates that we are more likely to be in the expiration stage of respiration rather than inspiration. Furthermore, preliminary results suggest a trending effect of the region (M1 vs. SMA) on breathing-action coupling following TBS.

World Languages and Cultures

46. Pasta and Politics: A Taste of Culinary Xenophobia in Italy

Presenter(s): Rachel Berns

Advisor(s): Dr. Sara Mattavelli, Dr. Anuradha Prakash

Italy has become a common "landing country" for many European and Asian immigrants, creating a perception of invasion that has led to cultural reactionism masked in the reinforcement of "traditional cuisine." For so-called traditional foods to endure, they must continually be reinvented, bearing different meanings and social values throughout time and space while accumulating rich, cultural baggage that serves as a powerful marker of identity in a given society. This project explores the role of traditional cuisine in Italian national identity and pride, and the subsequent historical culinary antagonism maintained in widespread attitudes toward ethnic cuisine in Italy. Through an analysis of primary and secondary literature, complemented by qualitative field observations in the Italian cities of Perugia and Modena, several instances of culinary discrimination are discussed within the political, social, cultural, and historical complexities of preserving tradition while also accommodating diversity, highlighting an interplay between nostalgia and xenophobia that we can almost taste. Key factors such as food legislation,

the tourism industry, and evolving attitudes among young generations are considered to yield a dynamic picture of the current perceptions of ethnic cuisine in Italy. Despite lingering biases, there is hope for a future of culinary coexistence and integrative celebration of non-Italian foods in Italian culture, driven by young individuals' openness to diverse tastes and traditions.

AF209A

Moderator: Dr. Jocelyn Buckner

Theatre

11:30 – 11:45 AM

Unmasking the Exploitation of Minority Voices in American Theatre Throughout the 21st Century

Presenter(s): Rhea Chhagan

Advisor(s): Dr. Jocelyn Buckner

Theatre has been a practiced art form for many centuries; it has no beginning and no end, no preference for space or time, and no bias towards cultures and people. Specifically, theatre in America has been around for as long as its people have been. It is important to study the errors of American theatre, notably its mistreatment of minority voices, so as to create a healthy, inclusive environment and provide diverse opportunities for all. Racism and discrimination are subconsciously woven into almost every aspect of our lives, just as critical race theory implies, and therefore it is essential to investigate how it affects the art of theatre, those who contribute to it, and those who learn from it. In this paper, I will unmask why theatre companies in America have failed to provide adequate support for minority artists and how the theatre industry, along with society, can work towards creating a foundation for racial harmony within the arts. To start, I intend to highlight the misuse of minority funding provided to theaters as well as the recent funding crisis affecting various theaters nationwide. Additionally, I will focus on those in leadership positions, the support provided to them, and the lasting influence a diverse leader can offer a company. Next, I aim to look at the season programming of major theater companies and the tragic cancellation of recent seasons. Finally, I will study the application of discriminatory performances and casting practices that can still be found in theaters today and its effects on the play's underlying message to the audience. Through this research, I implore that it is intrinsic to be "anti-racist", especially in the performing arts, in order to promote theatre as an art form that embraces all those who practice and enjoy it.

11:45 – 12:00 PM

The Psychology of the Stage: Intersections of Cognitive Science and Theatre

Presenter(s): Ariya Selvakumar

Advisor(s): Dr. Jocelyn Buckner

By engaging audiences in a stranger's story, theatre often depends on emotional contagion and empathetic responses to strike interest and investment in characters and their circumstances. Mirror neuron systems are those highly tied to the activation of empathy. These neurons are brain cells that activate when we perform an action and witness an action being performed. For example, when someone is crying, a subset of neurons that fire when we cry will also fire in

response to seeing this action, thus often leading to emotional contagion. With an understanding of cognitive science, we can closely examine the perspective-taking and emotion-prediction processes triggered among audience members watching actors and among actors embodying characters. The more we understand how the brains of actors and audiences function, the more effectively we can tell stories that impact them in significant ways, whether that's affecting the audience's socio-political beliefs or pro-social behaviors. In this study, I will summarize the primary cognitive science principles used by theatre researchers and outline how these principles relate to the processes of acting and spectating through a case study on the 2023 Chapman University Production of Bess Wohl's *Small Mouth Sounds* directed by Gregg Brevoort. I will also discuss ways this information can continue to be applied to maximize the positive impact of engagement with live theatre. Ultimately, I aim to reveal what our brains can tell us about how we empathize on and off stage.

12:00 – 12:15 PM

Behind the Scenes: Shining a Spotlight on Veiled Theatre Workers

Presenter(s): Ariel Bradshaw

Advisor(s): Dr. Jocelyn Buckner

My thesis aims to highlight traditionally underrepresented theatre artists. I wish to dive deeply into the backstage, or “veiled” workers, who continue to go unacknowledged. Why is there an aspect of “veiled” theatre created to stay hidden? Even in technical theatre, some specialties receive more credit or recognition than others. For example, the Tony Awards offer categories for direction, sound, light, costume, and scenic design, yet no award for stage management. How are institutions working to create more representation in an intentionally hidden space? This project will specifically focus on the representation of stage managers, arguably the most invisible and the most important people in a production. While covering the role and responsibilities of a stage manager, I will investigate why stage managers are so often overlooked and even expected to go unnoticed. Many theatrical practitioners often refer to the adage that “a stage manager did their job well if you never noticed something went wrong.” Is it true that excellence in stage management is only determined by the absence of conflict, or is the impact of an excellent stage manager simply taken for granted? My thesis will explore the realm of dedicated theatre artists who continue to experience underrepresentation in their field.

12:15 – 12:30 PM

Immersed in the World of Fear: The Art of the Scare in the Haunted House

Presenter(s): Riley Russell

Advisor(s): Dr. Jocelyn Buckner

In this project, I will explore and analyze the way that fear is created through the scenic design of the haunted attraction. Through an analysis of my case study of Knott's Scary Farm, I am looking

at analyzing how specific scenic elements and artistic techniques in Haunted Houses, or “Mazes,” elicit a visceral response from their audience. By understanding where the commercial haunt origins come from, I hope to grasp why people enjoy the thrill of getting scared and in turn, how scenic designers use that feeling to create designs that scare their audience. Through my own field research, videos and interviews with haunt designers and historians, and reviews of these events, I hope to collect enough information to grow my understanding of how the immersive world created for haunt is scary. In collaboration with Ann Nopper I hope to acknowledge the symbiotic nature of all theatrical elements, including lighting, sound, and costuming, to create an entire immersive experience and what commercial design offers to the haunt culture of the United States as a whole. Elements of scenic design that I would like to analyze include: storyboarding, maze layout, scenic artistry and painting, prop fabrication, and other haunting techniques that a scenic designer might use. Ultimately, I hope that by deep diving into the haunt industry, I am filling a gap that is not quite as widely known in the entertainment industry. As the popularity of these events continues to grow, having the opportunity to understand more fully what it takes to create a haunted attraction, I hope to get a better grasp on an industry that is only around for 2-3 months out of the year.

AF209C

Moderator: Dr. Kelli Fuery

Computational Science

11:30 – 11:45 AM

HarmonicThreads: A Smart Elastic Display to Support Musical Interactions

Presenter(s): Daisy Fernandez-Reyes, Ellie Nguyen

Advisor(s): Dr. Franceli Cibrian

Through music, children can learn to express themselves and communicate with others, thereby enhancing their social and emotional skills throughout their development. However, traditional musical instruments demand consistent musical training and control, which introduces a challenge for some individuals, including children with differences in their motor, sensory, and attention skills. In this research, we are designing and developing HarmonicThreads, a smart, cost-effective musical interface that allows users to produce music by touching a fabric. HarmonicThreads' design adopts the natural user interface of an elastic display, and it is augmented by generative machine learning algorithms to create music in real-time according to the user's interaction. To develop the sensing capability of the fabric, we explored two approaches, indirect optical sensing and direct touch sensing. By comparing both approaches, we found that direct touch sensing requires a less computationally expensive algorithm, less configuration, and less hardware than the indirect optical approach. Particularly, we may implement direct touch sensing by embedding conductive materials into a fabric, hence giving it the ability to sense and respond to touch stimuli directly, and eliminating the need for external

sensing hardware. Therefore, the architecture of our prototype involves microcontrollers that read data from capacitive touch sensor boards, and conductive threads sewn into a fabric. We hypothesize that, by designing intuitively with affordable and portable hardware, HarmonicThreads will mitigate the boundaries imposed by traditional musical instruments and will improve inclusivity for individuals with disabilities. In our future work, we will integrate generative algorithms to support personalization for neurodiverse individuals in different contexts.

Acknowledgements: The first and second authors of the abstract contribute equally to this research.

Reference: This abstract is based on a paper published at <https://doi.org/10.1145/3594739.3610727>

Psychology

11:45 – 12:00 PM

Examining the Association Between Race/Ethnicity and Pro-Environmental Attitudes in U.S. Republicans

Presenter(s): Sanchi Kohli

Advisor(s): Dr. Jacob Rode

U.S. Republicans tend to have low support for pro-environmental initiatives. However, recent findings suggest this varies by race/ethnicity, with Black and Hispanic/Latino Republicans reporting higher pro-environmental attitudes than White Republicans. Using data from two nationally representative sources, the current research extends this work by further examining racial/ethnic differences within Republicans (e.g., including Asian Republicans). The first was a primary study and probability sample of U.S. Republicans (N = 2,395). The second consisted of a secondary data analysis of the Cooperative Election Study across nine years (2014-2022; N = 123,133 Republicans). We tested the association between race/ethnicity and various pro-environmental attitudes, adjusting for relevant covariates such as age, gender, education, income, and region. In the first study, Asian and Black Republicans generally had significantly higher pro-environmental attitudes than White Republicans. In the second study, Asian Republicans tended to have the strongest pro-environmental attitudes, followed by Black, Hispanic/Latino, and White Republicans, respectively. This order remained across most outcomes though the pattern of significance varied; for example, Asian Republicans' attitudes were consistently significantly higher than Hispanic/Latino and White Republicans' but only sometimes significantly higher than Black Republicans' attitudes. The findings highlight the important variation in pro-environmental attitudes that exists within Republicans, specifically across racial/ethnic groups and type of pro-environmental initiative. Our research suggests that policymakers should consider this variation when designing environmental initiatives for the broad range of American communities.

Biochemistry and Molecular Biology

1. Development of Colloid-Collagen Composites for Bioengineering Applications

Presenter(s): Kyle Choy, Anne Marie Santich

Advisor(s): Dr. Andrew Lyon

Extracellular matrix-derived materials have been demonstrated to be an extremely important class of materials for bioengineering applications such as tissue scaffolding. Collagen is a particularly excellent example of this due to its biocompatibility and biodegradability. However, collagen's utility in applications has been frequently limited by the weak mechanical strength of 3D gels prepared from the material. To circumvent this limitation, we are studying the incorporation of microgels in collagen composites for mechanical reinforcement. Our group's development of ultra-low crosslinked poly(N-isopropylacrylamide) microgels has enabled this work, as the incorporation of these microgels increases the mechanical strength of the collagen composites showing great potential for bioengineering applications. Previous research done by the Lyon group showed that incorporation of microgels in collagen composites and varying microgel concentrations during development resulted in seamless integration of the microgel into the composites. Building on that research, we have successfully developed a methodology to create highly packed colloid-collagen composites with different amounts of collagen using colloidal "pastes" developed in our lab. With the use of optical microscopy, we observed and characterized these colloid-collagen composites. Even when using highly packed, rigid pastes, collagen is able to grow 3D networks that integrate into the paste, presumably due to the low shear stress required to displace the microgels. The next steps in our research are to conduct more studies on the colloidal paste to do rheology modifications of extracellular matrix-based materials, notably collagen. To accomplish this, we will conduct experiments including real-time imaging of collagen formation using optical microscopy. This will allow us to see the integration of the microgels while the collagen grows which will help us better characterize these composites that are the next step in advancing bioengineering applications.

2. Is Phosphorylation of Histone H3 Inhibited by Neighboring Arginine Methylation?

Presenter(s): Shaina Ambashta

Advisor(s): Dr. Cecilia Lopez

Histone proteins play a crucial role in DNA storage and chromosome formation. Post-translational modifications (PTMs) on histones, such as phosphorylation, can impact gene expression and are associated with diseases like cancer. Histone H3 contains an arginine-lysine-serine (RKS) motif that serves as a recognition site for Aurora B kinase. Phosphorylation of serine residue 10 is linked to chromatin condensation during cell division. Our group has shown that methylation at arginine residue 8 is inhibited by neighboring phosphorylation at serine residue 10. We aim to investigate the effects of arginine methylation on the deposition of phosphate groups to serine 10 using Aurora B kinase. We hypothesize that the presence of a methylated arginine residue will prevent phosphorylation at serine 10. To test this hypothesis, kinase assays were performed in vitro using

unmodified and methylated histone H3 as substrates. The amount of phosphorylation was quantitated using a kinase assay which measures luminescence. Short peptide sequences corresponding to the relevant region of histone H3 will also be used as substrates to further characterize this interaction. Since there are various forms of arginine methylation, the methylated forms including monomethylated arginine (MMA), symmetric dimethylated arginine (SDMA), and asymmetric dimethylated arginine (ADMA), will be compared to the unmodified form. Our preliminary results show that Aurora B kinase is able to phosphorylate serine residues in histone H3 in the absence of neighboring methylation. Understanding the interplay between arginine methylation and phosphorylation can provide insights into the regulation of phosphorylation. By investigating the impact of methylated arginine residues on the ability of Aurora B kinase to phosphorylate histone H3, potential therapeutic targets for preventing aberrant phosphorylation could be identified. This research contributes to understanding PTMs and their role in controlling cellular processes, particularly cell division and gene expression regulation.

3. Counter-ion Effects on Sulfur(VI) Fluoride Exchange Mediated by Mixed Anion Calcium Salts.

Presenter(s): Kurt Horney

Advisor(s): Dr. Maduka Ogba

This research centers on the investigation of how modifying the counterions in a Lewis acidic calcium bistriflimide salt, denoted as $[\text{Ca}(\text{NTf}_2)_2]$, influences its ability to catalyze SuFEx reactions with nitrogen-based nucleophiles. It is worth noting that prior literature had proposed that replacing the bistriflimide anion with hexafluorophosphate, resulting in $[\text{Ca}(\text{NTf}_2)(\text{PF}_6)]$, would heighten the Lewis acidity at the calcium center. However, in the study of SuFEx reactions, it is found that the inclusion of PF_6^- doesn't entirely inhibit the reaction but does diminish the yield of the desired product. To shed light on this apparent discrepancy in the impact of the PF_6^- counterion on Ca^{2+} reactivity, computational techniques were employed to elucidate the probable SuFEx mechanism and activation barriers associated with $[\text{Ca}(\text{NTf}_2)(\text{PF}_6)]$, and these results were compared with previously reported findings from the OMO Lab's investigation of the SuFEx mechanism using $[\text{Ca}(\text{NTf}_2)_2]$. This poster will present the current hypothesis concerning the observed effects of counterions, drawing from our computed reaction coordinates and Ca^{2+} activation modes.

4. Effect of Pomegranate Extract and Caffeine on E-cadherin and SNAI1 Expression in Pancreatic, Breast, and Prostate Cancer

Presenter(s): Owen Tapia

Advisor(s): Dr. Melissa Rowland-Goldsmith, Dr. Marco Bisoffi

Combining pomegranate juice extract and caffeine produces anti-proliferative and pro-apoptotic effects on COLO 357 metastatic pancreatic cancer cells. RNA-sequencing whole-transcriptome analysis of differential gene expression in COLO-357 cells before and after receiving the treatment

revealed a 0.85-fold downregulation of CDH1, the gene for the expression of E-cadherin. The post-treatment downregulation of E-cadherin caused further exploration of the regulatory pathway of CDH1. Downregulation of E-cadherin is a marker of epithelial-mesenchymal-transition (EMT), a pro-metastatic mechanism cancer cells undergo as they prepare for invasion and metastasis. Another marker of this EMT pathway is the upregulation of SNAI1, a negative regulatory protein of CDH1. The PJE and caffeine treatment is hypothesized to upregulate and downregulate CDH1 and SNAI1, respectively. This study aims to further analyze the regulation of CDH1 and SNAI1 as a result of the treatment within COLO 357, but also explore if the possible patterns expressed in COLO 357 are seen in other cancer types. MCF7 and PC3, which belong to breast and prostate metastatic cancers, were also selected to undergo the treatment. CDH1 and SNAI1 protein amounts were assessed via Western Blot analysis, ensuring the presence of the desired proteins. CDH1 and SNAI1 mRNA expression was validated by qRT-PCR analysis after the dose (75 µg/mL PJE + 1.27 mg/mL caffeine) was given.

Biological Sciences

5. Cell Surface Receptors for Targeting Radiotherapy to Cancer Sites and Other Applications - An Overview

Presenter(s): Keon Jafari

Advisor(s): Dr. Kamaljit Kaur

Cell surface receptors have emerged as versatile molecular targets for a wide range of biomedical applications, including radiotherapy targeting, drug delivery, and diagnostic imaging. A particular spotlight shined upon Prostate-Specific Membrane Antigen (PSMA) and Somatostatin receptors highlights these receptors' significance in radiotherapy targeting and their applications in precision medicine. The intricate molecular mechanisms underpinning these receptors, their exploitation in therapeutic strategies, and their expanding roles in diverse medical applications were examined. Radionuclide Therapy effectiveness using peptides, that target radionuclides to cancer sites, has gained attention due to the recent FDA approval of two peptide-radionuclide therapy conjugates and one in phase II clinical trials. For instance, Lutetium 177 DOTA TATE, and PEN-211 have been explored, as well as their molecular contexts in treating and visualizing tumors with high Somatostatin receptor (SSTR2) expression. Nonetheless, this overview underscores the imperative need for interdisciplinary collaboration to fully unlock the potential of cell surface receptors for multifaceted medical applications.

Business

6. Deinfluencers and Social Media Trends

Presenter(s): Misha Harneja, Emma Han

Advisor(s): Dr. Cristina Nistor, Dr. Gokcen Balli, Dr. Niklas Myhr, Dr. Charlene Chu

Social media is a way for brands as well as consumers to engage with each other through shared content and conversations. Influencers are content creators who collaborate with brands to promote a brand image or specific products to their followers. In a new social media trend, influencers have also become “deinfluencers” who advocate against certain behaviors or products. In this project we aim to understand the new phenomenon of “deinfluencers”, social media content creators whose posts encourage consumers against certain purchases or habits. For example, some deinfluencers talk about consumerism while others recommend against purchasing a specific hair mask. The diversity of opinions and motivations for deinfluencers makes it challenging to uncover their motivations for creating this type of content. Our project combines secondary data research on popular press articles and primary data collection on Instagram in order to study the deinfluencer motivations.

Chemistry

7. Synthesis and Characterization of a Breast Cancer Cell Targeting Peptide

Presenter(s): Manya Chandra, Jane Yao

Advisor(s): Dr. Kamalijit Kaur

This research aims to create more effective medication to treat breast cancer. Currently, the main form of treatment for a subtype of breast cancer called Triple-Negative Breast Cancer (TNBC) is chemotherapy; however, this treatment lacks selectivity between the healthy and malignant cells and has run into issues with limited access to the cancer cells. Our lab works specifically with TNBC, which is not only the more aggressive version of breast cancer but is challenging to target since it lacks common characteristics of breast cancer cells, such as overexpression of human epidermal growth factor 2 (HER2) or hormone receptors. This is why our lab is focused on creating peptide drug conjugates (PDCs), in which a cancer-killing drug, doxorubicin, is attached to a cancer cell targeting peptide for selective delivery to TNBC cells. This peptide binds to a Keratin-1 receptor (a unique receptor found on the surface of TNBC cells), and the peptide enters the cell with the drug. Once inside the cell, the drug is released from the peptide and kills TNBC cells selectively. Such treatment makes the drug delivery much more efficient, as it delivers directly to the cancer sites and avoids targeting the healthy cells. The objective of my study is to synthesize, purify, and characterize a TNBC cell-targeting peptide. Results obtained from this study will be presented here.

8. Meta-Analysis of the Chemical Compositions of Herbal Remedies as Treatments for Polycystic Ovary Syndrome

Presenter(s): Nataly Reyes

Advisor(s): Dr. Yu-An Chang

This study focuses on providing direct insight into alternative holistic methods to pharmaceuticals for women with polycystic ovary syndrome. Mainly on analyzing the chemical structures of popular herbal medicines that are believed to be aids in remedying symptoms of PCOS and understanding why they can be reliable treatments by comparison to common prescribed drugs. This information is more relevant now than ever due to recent pushbacks on the use of pharmaceuticals from the common negative side effects. Most infamously, the herbals analyzed are Cinnamomum Cassia (L.), Linum Usitatissimum L., Nigella sativa L., and Trigonella foenum-graecum L. These herbs have a reputation for lowering BMI, insulin, increasing fertility, and regulating menstrual cycles without any alarming adverse effects.

9. Comparative Analysis of +2 Oxidation State Metal Lewis Acids in Sulfur(VI) Fluoride-Amine Coupling Reactions

Presenter(s): Paul Rosa

Advisor(s): Maduka Ogba

We investigate how the nature of the metal ion affects the capacity of Lewis acidic salts to act as catalysts in metal-mediated sulfur(VI) fluoride exchange (SuFEx). Previous reports suggest that calcium bistriflimide $\text{Ca}(\text{NTf}_2)_2$ promotes efficient coupling of sulfur(VI) fluorides to amines. However, a systematic investigation into ion-pair effects in promoting sulfur(VI) fluoride activation has not been reported. Therefore, we lack mechanistic data that enables rational experimental redesign to improve reaction efficiency. In this work, we present a computational analysis of the likely SuFEx mechanism and activation mode mediated by zinc bistriflimide $\text{Zn}(\text{NTf}_2)_2$. We hypothesize that $\text{Ca}(\text{NTf}_2)_2$ is more effective than $\text{Zn}(\text{NTf}_2)_2$ due to its larger atomic radius, thus allowing better accommodation of the key salt-substrate interactions that promote SuFEx. We compare our findings to previously reported work with $\text{Ca}(\text{NTf}_2)_2$. Our results lend insights into how steric and electronic factors affect the Lewis acid reactivity of group II salts, and their capacity to facilitate the activation of fluorinated compounds.

Communication Studies

10. Parasocial Relationships and their Likelihood to Incite Jealousy and Hateful Behaviors

Presenter(s): Herron Pike, Clare Thompson, Kelli Chamberlain, Dylan Gallegos, Ashley Kent

Advisor(s): Dr. Rebecca Forster

The goal of our study is to conduct and gain research on parasocial relationships and to see how jealous individuals get when they have a parasocial relationship with a media figure who is in a romantic relationship. A parasocial relationship is when someone of the general public has a one sided, not reciprocated, relationship with a celebrity that they do not know. A romantic parasocial relationship is when this person believes that they are romantically involved with said celebrity. First, we hypothesize that romantic partners of media figures who demonstrate negative characteristics are more likely to incite jealousy than partners who demonstrate positive characteristics. The attachment one has with a celebrity determines the extent to which they distrust or doubt their partner, stemming from a sense of insecurity. If the partner is less likable, the chance of negative feelings developing towards them increases. We also hypothesize that romantic partners of media figures who demonstrate negative characteristics are more likely to be sent hateful messages than partners who demonstrate positive characteristics. A person with a parasocial relationship will not believe that this romantic figure is “good enough” to be with their celebrity crush, or believe they are a bad influence on the media figure. They will then take it upon themselves to lash out and defend the celebrity figure they have a parasocial relationship within a possessive attempt to protect them. We created a survey that will be sent out to people around Chapman University’s campus. The survey includes a series of questions about whether the subject has ever had a parasocial relationship and the details of that relationship.

11. Exploring how Typecasting and Counteracting Affect Audience's View of Actors

Presenter(s): Rohan Chhabra, Katelin Paik, Aaron Johnson, Kelly Park, Lauren Wang

Advisor(s): Dr. Rebecca Forster

Typecasting is the idea that certain actors are known for only portraying certain types of roles or only being cast in certain genres of film, such as comedies or dramas. When an actor is typecast, they are in a similar film to their usual roles, and counteracting is the opposite. This study looks at and measures how casting actors in roles that differ from the types of roles they are usually associated with impacts audience perceptions of their acting abilities and influences audience interest in the film, depending on the actors chosen for the specific roles. This study will provide information on what audience members are interested in when it comes to actors being cast in their typecast or outside of it, which can help to predict trends for the success of future films. Due to the novelty and change, we believe that casting actors outside of their typecast will increase audience’s desires to watch the film. It will also increase their assessment of the actors’ talents because it will show the audience the actor has range. To measure this, we will conduct a

study where participants will be shown a fictional film description for a dramatic film starring a well-known comedic actor, and vice versa. Afterwards, the participants will be asked questions about their desire to watch said film and their opinions on the actors' talent.

Computer Science

12. An Immersive Data Annotation Tool for Visual Analysis of Human Interactions in VR

Presenter(s): Isaac Browen

Advisor(s): Dr. Trudi Qi

Understanding human behavior in virtual reality (VR) is a key component for developing intelligent systems to enhance human focused VR experiences. The ability to annotate human motion data proves to be a very useful way to analyze and understand human behavior. However, due to the complexity and multi-dimensionality of human activity data, it is necessary to develop software that can display the data in a comprehensible way and can support intuitive data annotation for developing machine learning models able recognize and assist human motions in VR (e.g., remote physical therapy). Although past research has been done to improve VR data visualization, no emphasis has been put into VR data annotation specifically for future machine learning applications. To fill this gap, we have developed a data annotation tool capable of displaying complex VR data in an expressive 3D animated format as well as providing an easily-understandable user interface that allows users to annotate and label human activity efficiently. Specifically, it can convert multiple motion data files into a watchable 3D video, and effectively demonstrate body motion: including eye tracking of the player in VR using animations as well as showcasing hand-object interactions with level-of-detail visualization features. The graphical user interface allows the user to interact and annotate VR data just like they do with other video playback tools. Our next step is to develop and integrate machine learning based clusters to automate data annotation. A user study is being planned to evaluate the tool in terms of user-friendliness and effectiveness in assisting with visualizing and analyzing human behavior along with the ability to easily and accurately annotate real-world datasets.

13. An Analysis of User-Elicited Dual-Hand Gestures in Virtual Reality

Presenter(s): Katie Ho, Meghna Raswan, Tyler Kay, David Zhang

Advisor(s): Dr. Trudi Qi, Dr. Franceli Cibrian, Dr. Hector Camarillo Abad

Recent advancements in virtual reality (VR) have focused on enhancing intuitive hand-gesture interactions. Despite extensive research in gesture elicitation, there is no detailed analysis specific to VR hand motion gestures. This study addresses this gap by exploring user-preferred hand gesture interactions with 3D virtual content using dual-hand controllers through a user-elicitation approach. Concentrating on four core VR interactions: pan, rotation, zoom, and selection, we aimed to analyze users' mental models in developing gestures, striving for intuitive and clear communication in VR. The study involved 26 participants, each wearing a VR headset and holding two controllers, recording 6-dimensional hand spatial position/rotation and additional metrics

related to their gesture performance. Participants interacted with 3D animations of virtual objects, eliciting hand gestures for each interaction and repeating each five times. Following interactions, feedback was gathered through surveys and interviews. Based on 3D visualizations of user-elicited gestures, we developed a systematic dual-hand gesture codebook based on a 10% data subset, characterizing gestures through observed patterns. Two researchers collaboratively refined the codebook, achieving $\geq 80\%$ agreement and a Kappa $p \geq 0.8$, establishing a comprehensive VR dual-hand gesture codebook. The codebook categorizes gestures into shape, handedness, direction, and symmetry. Findings revealed that 55.4% of pan interactions were unimanual with 78.8% forming a quarter-circle shape; 71.04% of rotation interactions were bimanual with majority forming a semi-circle shape with both hands. This research advances our understanding of gestures, fostering deeper insight into intuitive gestures and facilitating more efficient pattern identification across gestures. The next step is developing a natural user interface for VR interactions, grounded in user-elicited gestures, to ensure a supportive, intuitive user experience.

Engineering

14. Bent into Shape: Fish Invented the Back Brace First

Presenter(s): Eric Chier, Ethan Tapia

Advisor(s): Dr. Cassandra Donatelli

Throughout evolutionary history, fishes have used biological armor for a multitude of functions from enhancing passive protection to reducing hydrodynamic drag. Fish armor is composed of interlocking plates which stiffen the body and provide anisotropic resistance to forces and motion. The shape of the armored plates is as diverse as fishes themselves, ranging from the small interlocking bony scales of the gray bichir, to the large overlapping scutes of the northern spearnose poacher. The diversity of armor is a great source of inspiration for the creation of biomedical devices. Design principles derived from studying this piscine armor can potentially be used to create tools, such as medical joint braces. We investigated the role of the shape and spacing of armored plates in the mechanics of bioinspired models and fabrics, all with the goal of generating data on these aforementioned principles, particularly the selective resistance of motion - the prevention of motion in some directions and allowing for motion in other directions. We used two different techniques to create our models: 1) printing full 3D models on a polyjet printer (Stratasys J850) and 2) printing 2D armored plates with an FDM printer (Prusa i3), embedding fabric within the print during fabrication. We then measured bending stiffness using a universal testing machine (Instron). This combination of techniques gives us the means to answer questions about how morphology affects the flexural mechanics of a 3D structure, potentially applying them to the fields of animal and human biomechanics in the future. As I am studying to design and engineer prosthetics, such developments are supremely relevant to me and my future.

English

15. Queer x Trans* Memoir: In Sight of an Embodied History

Presenter(s): Rhyan Warmerdam

Advisor(s): Dr. Jan Osborn

Are queer identities innate? What exactly constitutes a queer identity? What prompts a person to identify with a particular queer or trans identity category? Prominent queer theorist Judith Butler contends that “There is no gender identity behind the expressions of gender; that identity is performatively constituted” (Butler 34). However, many scholars have claimed that Butler’s theory is “not compatible with lived experience” (McCann & Monaghan 134). This project utilizes the genre of memoir to gain insight into lived experiences to put this theory, as well as other queer theories, to the test. Through a mini historical archive of twelve queer and trans memoirs, this project uses Deleuze and Guittari’s assemblage theory as its framework to identify characteristics of queer identities. Stivale defines an assemblage as: “A collection of things and their relations expresses something, a particular character...the elements that make up an assemblage also include the qualities present (large, poisonous, find, blinding, etc.)” (Stivale 78). Alongside uncovering what a queer identity is by identifying characteristics present across twelve memoirs, this project simultaneously seeks to analyze what a queer identity does by examining the role that particular identity categories play in the lives of memoirists. How does the existence of identity labels shape reality in itself? How do these labels function as a mode of self-understanding and relationship building? Overall, the combination of the two analyses provides unique insight into the lives of queer individuals in the United States of America.

Environmental Science and Policy

16. Impacts of Rapidly Collapsing Permafrost on Carbon Dioxide and Methane Emissions in Arctic Sweden

Presenter(s): Kainani Tacazon

Advisor(s): Dr. Richelle Tanner

Permafrost peatlands store vast amounts of soil organic carbon, which, when thawed, can fuel greenhouse gas (GHG) production through multiple biogeochemical processes. Rising global temperatures impact the fate of permafrost peatlands, altering hydrology, vegetation, and microbial activity across permafrost thaw gradients. We measured methane (CH₄) and carbon dioxide (CO₂) emissions along a collapsed permafrost thaw gradient in July 2023 at Stordalen Mire, Northern Sweden (68°21’N, 19°20’E) to compare with fluxes from 2019. The sites were identified using aerial photography from 1970 to be a chronosequence of palsa to fen transitions and encompass sites that remain palsas, sites that have been fens since 1970, and sites that transitioned prior to and after 2019. Methane and CO₂ emissions were measured using a flux chamber and portable GHG analyzer (LICOR) in the field under light and dark conditions to allow

for measurement of net ecosystem exchange and ecosystem respiration. Supplemental measurements including active layer depth, water table depth, photosynthetically active radiation (PAR), vegetation cover and type, and air/soil temperatures were collected. We found increased CH₄ emissions with permafrost thaw, in which the recently collapsed palsas had the highest emissions. Our results suggest higher water table levels and increased permafrost thaw promote higher CH₄ fluxes. Compared to 2019 fluxes, we found a substantial increase in CH₄ emissions across all sites, particularly those undergoing continuous rapid permafrost thaw. Future analysis may investigate how microbial communities and terminal electron acceptors (TEAs) influence CH₄ production through competition within the anaerobic CH₄ oxidation and respiration processes. To better understand ecosystem emission dynamics, it is imperative to investigate sequential changes in GHG emissions along thaw sequences to assist in biogeochemical modeling and climate predictions.

17. Unraveling Epigenetic Patterns in Juvenile Mussels: The Role of DNA Methylation and How it Drives Thermal Tolerance at the Organismal Level

Presenter(s): Riya Belani

Advisor(s): Dr. Richelle Tanner

Climate change is influencing the frequency and intensity of extreme temperatures for organisms worldwide, but the effects are especially felt in the marine intertidal zone where organisms like *Mytilus* mussels already live near their thermal limits. The thermal plasticity of physiological traits like growth is well-understood in *Mytilus* mussels, but we understand far less of the epigenetic mechanisms underlying these traits and their inheritance. We explored whether DNA methylation levels in juvenile mussels varied between sites with different thermal variances in an intertidal zone at the Hopkins Marine Station in Monterey, CA. Juvenile mussels were exposed to protected (warm) and exposed (cool) wave conditions in a field acclimation experiment. Previous studies from this experimental design showed higher growth rates and survival in exposed (cool) juvenile mussels after one month. In this study, gill tissue was collected from these same individuals to undergo reduced representation bisulfite sequencing (RRBS) to evaluate methylation at CpG islands in the genome. We quantified, visualized, and compared DNA methylation profiles between the treatment conditions using Bismark and MethylKit. Global methylation levels were not significantly different between the cool and warm sites, however, we found some patterns related to genes involved in key cellular stress pathways and growth. This research is a first investigation into the role of epigenetic modifications that influence physiological tolerance under heat stress in highly dynamic environments.

Health Sciences and Kinesiology

18. South Los Angeles Parks Observation Research

Presenter(s): Valeria Delgado, Melissa Ramos

Advisor(s): Dr. Dede Teteh, Dr. Jason Douglas

The health impact of elevated gang activity on the residents of South Los Angeles has been a pressing concern with limited research. Thus, this study aimed to understand the potential health repercussions within this context, specifically by examining how different patrolling systems influence community members' physical activity in public parks. To increase security, the city of Los Angeles implemented police patrol programs in multiple high-risk parks. Concurrently, the Advocates for Urban Peace & Unity (APUU), a local community organization, introduced a novel approach of community-led park patrolling. Essentially, respected community members volunteer to patrol and maintain safety and order in the parks. Our study compared activity levels of community members within parks patrolled by police versus parks patrolled by community members. During the summer of 2023, we observed 17 parks in South Los Angeles – 8 patrolled by APUU community members and 9 patrolled by police. We collected and recorded data during each observation, then transferred and analyzed data by SPSS software. Preliminary findings suggest an anticipated higher physical activity rate in community-patrolled parks. The underlying hypothesis is that individuals will feel more comfortable and safe when surrounded by their own community members, and hence, encouraged to engage in physical exercise within these environments.

Music

19. Music In Car Commercials

Presenter(s): William Mills

Advisor(s): Dr. Jessica Sternfeild

In the modern automotive industry, they are always coming out with the latest model with different features and characteristics that the preceding vehicle did not have. This can be seen in the German automotive industry, the Italian automotive industry and the US. In this essay, I plan on taking a deep look at the music that is used in these advertisements.

From my research, the use of music in the advertisement is just as important as the absence of music. While marketing vehicles in the high performance and exotic market, there seems to be a balance of when you hear music and when you don't. On average, I've noticed there is music that plays in the beginning of the commercial. The use of this is that depending on the brand make and model of the car being advertised, it sets the tone and shifts your mind into how you should portray this car. It would seem that music is used to highlight features and characteristics of the car while the absence of music is used to hear the engine and exhaust note of the car. I will discuss this in greater detail, using examples, in this paper.

Physical Therapy

20. Altered Sensorimotor Processing During the Active Straight Leg Raise Test in Individuals with Back Pain.

Presenter(s): Tammy Nguyen

Advisor(s): Dr. Jo Armour Smith

Low back pain (LBP) is a serious, chronic condition that affects many people across the lifespan. Previous studies have compared brain activation during painful stimuli in individuals with and without LBP. There are few studies investigating brain activity while participants perform a movement task. The purpose of this study was to analyze the activation of sensorimotor brain regions in relation to the utilization of the trunk and hip musculature in healthy young adults and young adults with history of LBP. Blood Oxygenation Level Dependent fMRI (BOLD fMRI) was utilized to quantify brain activity by measuring blood flow. It was performed on 30 healthy participants (average age 24 [standard deviation 4.3] years, 19 females) and 55 participants with a history of LBP (age 22.0 [3.1] years, 34 females). Each participant performed two tasks in the scanner using the lower limb/trunk musculature. For the Short-Arc Quad (SAQ) task, the participants performed repetitions of a lower-leg raise over a period of 6 minutes with the upper leg supported, in response to a visual cue. For the Straight Leg Lift (SLL) task, the participants raised the entire leg. The SLL task was more challenging to perform due to the leg not being supported, and required participants to utilize their trunk and hip musculature to lift their leg and stabilize the trunk. The data were processed using SPM12 to identify activation in sensorimotor regions while performing the tasks. Participants reported minimal discomfort during the tasks (LBP group 0.5/10 (0.9) pain; Control group 0/10 (0) pain). For the easier SAQ task there was no difference in activation between groups. For the SLL task, the LBP group had significantly greater activation in multiple regions including the angular gyri bilaterally, the supramarginal gyrus contralateral to the moving limb, and the bilateral cingulate cortices. We conclude that young adults with a history of LBP have altered cortical sensory and motor function during movement tasks involving the trunk musculature that may contribute to persistence of symptoms over time.

21. Augmenting Hand and Arm Training for Persons with Hemiparesis

Presenter(s): Brooke Stein

Advisor(s): Dr. Susan Duff, Dr. Rahul Soangra, Dr. Alison McKenzie

Background. Hand and arm dysfunction due to neural disorders significantly influences quality of life. Activity-based training has been found to improve function. These improvements could be augmented with transcutaneous spinal cord stimulation (tSCS) due to the modulatory effect it has on spinal and supraspinal networks. **Objective.** The primary aim is to determine if a 4-week training program will improve hand and arm function. The secondary aim is to determine if the addition of tSCS to a second 4-week training session will further improve function. **Design.** This is a pre-posttest, controlled trial for persons 10-75 years of age, >6 months post stroke or with unilateral cerebral palsy. **Methods.** Participants will engage in two 4-week training periods,

3x/week for 2 hours/day. The 1st period will include unimanual and bimanual training alone. The 2nd period will be augmented with low frequency tSCS to the C5-T1 spinal region. Stimulation intensity will be based on individual muscle activation during 3 tasks: 1) grip dynamometry; 2) grip-lift; and 3) target pointing. Outcome measures taken before, midway, and after training are: Canadian Occupational Performance Measure (COPM), dexterity, daylong arm use, grip/pinch strength, sensibility, questionnaires, bilateral hand/arm surface electromyography, and Upper Extremity Fugl-Meyer (UEFM). Results: Six participants have completed the 1st 4-week training period without tSCS. Individual data reveals improvements in the COPM, Grip strength, dexterity, and the UEFM. Findings for other measures after the 1st period are mixed or in process. Conclusion: Preliminary findings from this ongoing study reveal that participants made improvements in most measures. The next phase of the study will determine if the addition of tSCS to training further augments hand and arm function.

Political Science

22. The New World Order: What Conspiratorial Thinking Means for United States' Politics

Presenter(s): Aidan Thompson

Advisor(s): Dr. Ann Gordon

Conspiratorial thinking has become an increasingly prevalent factor in the lives and political activity of even normal people. Fears about tragedy, disasters, and the government have created and inflamed suspicion and conspiratorial mindsets. In recent years, formerly fringe conspiracies have gained more prominence online and are just beginning to make their way into politics. It is for these reasons that this research looks at the increase in and effect of conspiratorial thinking as it relates to domestic politics. Specifically, this research studies the increase in theories relating to the alleged shadow government, in all of its manifestations. The belief in the existence of the shadow government is central to many conspiracy theories, making it vital to understand why the theories exist. It is worth mentioning that conspiracies relating to this topic can vary widely from one another and that many scholars, as well as conspiracy theorists, focus on different, specific factors and theories over others. Due to this fact, this research will focus on and mention multiple theories, with their common denominator being that they relate to some kind of shadow government. It is from there that study and determination will be made to the political and socioeconomic factors that allow these theories to prosper, who is responsible for creating and propagating them, and what can be done about it. The data used in this research was compiled from the FEAR surveys and previous literature on the subject.

23. Influence of Public Opinion on Military Conflict

Presenter(s): Brianna Buzzell

Advisor(s): Dr. Ann Gordon

Following the dissolution of the Soviet Union, nuclear disarmament has been an increasing problem between the United States and several other countries. Through current international affairs and conflicts, such as the Russian invasion of Ukraine and the Israeli-Hamas war, the danger of the U.S. getting involved in a military conflict has risen. With this taken into consideration, the chances of another world war occurring seem also high. In this paper, I examine American public opinion on military conflict (world war, armed conflict, use of force) and how it is influenced by differing factors. Through the use of the Chapman University Survey of American Fear Survey Wave 9, published in 2023, and a representative national sample, I found that people's fear of another country using its nuclear weapons, getting involved in a military conflict, or beginning another world war has influenced opinion through news sources, gender, political gain, and other existing fears. As conflict and violence break out throughout the world, the looming fear of nuclear weapons being used continues to grow in today's society. With public opinion being influenced by so many other factors, public opinion continues to be morphed which can cause turmoil and intimidation among the American people. The rising threat of another country using its nuclear weapons or starting a world war threatens the national and international security of the American people and can create instability in foreign policy.

24. Moving Beyond the CNN Effect: Fears in the U.S. of Nuclear Weapons Use and a Third World War

Presenter(s): Elena Baker

Advisor(s): Dr. Ann Gordon

When consuming various forms of news, it is easy to become so engrossed in the information presented that one fails to think critically about the source of such information and how it is portrayed. Yet, news portrayals can influence public perceptions regarding the individuals, groups, and institutions involved in reported events. With the growing political polarization in the U.S., examining the type of narrative one receives from the news has become increasingly relevant. The advent of new streaming technologies, the Internet, and social media allows individuals to easily subscribe to partisan news that follows their ideologies. This breakdown in the information commons and increase in information silos is particularly prominent across social media platforms, where: "algorithms are designed to keep eyeballs in place by buffering against exposure to alternative viewpoints" (Baum and Potter 2019). Thus, this study will examine the relationship between news consumption habits and specific fears of the American public. This research will use survey data from the CSAF Wave 9 American Fears Survey to examine Americans' fears of the U.S. becoming involved in a third world war, as well as their fears of nuclear weapons use by Russia, Iran, and/or North Korea. Specifically, this study will explore how these fears are impacted by the frequency of Americans' news consumption and by the source(s) from which that news comes: conservative versus liberal media outlets and social media. This study has broad

implications for U.S. society and politics. For instance, foreign policy is affected by public opinion, which can be influenced by narratives presented in the news media. This can have a reciprocal effect on policy decisions: strong public opinion may influence politicians' actions, and politicians can also weaponize the public's fears fueled by the news media to pursue their own agendas.

25. Socialism, Communism, Capitalism: The Driving Fear for All

Presenter(s): Lorenzo Collier

Advisor(s): Dr. Ann Gordon

Though many nations have experimented with the ideas of socialism and communism, most have encountered strong opposition through fear of the matter. This paper investigates the underlying determinants of the fear of socialism through several background factors such as age, political party, and education. Through information ascertained from the Chapman Survey of American Fears, a representative sample of U.S. adults selected whether or not they have certain fears of socialism, communism, or capitalism, along with providing their own background identities including age, education, and political party. Along with these factors I looked at what exactly socialism is and who it benefits, in order to bridge together an understanding of what drives the liking and fear of socialism. What I found is a strong connection between a rise in age and a rise in fear of socialism, along with an inverse connection to what political party is more likely to reject the idea of capitalism. Through empirical evidence and data analysis, I offer insights into the real-world impact of public opinion, both modern and from history, and its effect on these determinants. The information that I find in this paper can aid the reform of economic systems by looking at the impact of public opinion on existing ones, and seeing how mutual common ground can be found between groups. By unraveling the driving forces behind these fears, I aim to facilitate a more nuanced and informed dialogue, fostering constructive discussions on the future of socio-economic systems and governance.

26. Xenophobia in the US

Presenter(s): Remy Mickelson

Advisor(s): Dr. Ann Gordon

Throughout history, humans have "otherized" people whom they find different from themselves. Within the US, sentiments of nativism and xenophobia have persisted along with the rising trends of migration. In this paper, I examine the extent to which anti-immigration beliefs result from political ideology, more specifically, if Donald Trump's election caused an increase in xenophobia in the US. Using data from The Chapman University Survey of American Fears spanning multiple years, I found that political party affiliation does have a positive correlation to fear of immigration. Moreover, I found that of the people who voted for Donald Trump, they were far more likely to be afraid of immigration. After thoroughly dissecting the data, I also found that the fear of whites losing the majority correlates with an increased fear of migration. As our world grows increasingly globalized, immigration to the US has continued to increase as well, which has in turn caused many white Americans to feel a sense of fear and hatred towards immigrants because of their

possible threats to the homogenous white majority. Although finding one specific cause for anti-immigration sentiments is seemingly impossible, addressing the harmful nature of xenophobia, especially in a country built by immigrants is important in eventually finding an equilibrium on immigration policy in the US.

27. Civic Duty or Right? Citizens' Perspectives on Voter Participation

Presenter(s): Taylor Michel

Advisor(s): Dr. Ann Gordon

While it is not the law in the United States to require citizens to engage in the democratic process, their participation is critical to the well-being of our society. In our electoral system, voting could be considered a civic duty or civic right, depending on one's feelings and obligation towards the democratic process. In this paper, I examine the role that a citizen's sense of civic duty has on their engagement in the political process. Relying on the 2020 data from the American National Election Study, I find a significant correlation between respondents' likelihood to consider voting a civic duty and their turnout in the November 2020 election. I also find a strong relationship between the intensity of respondents' feelings about voting and their perspectives on the importance of the election's outcome. Finally, I find a connection between the strength that respondents believe voting is a civic duty and how frequently they pay attention to politics and elections. Although achieving 100% voter participation in an election is not a realistic goal, focusing on the factors that elevate a citizen's sense of civic duty will increase voter enthusiasm and motivation to turnout during elections will ultimately improve the effectiveness of the democratic process.

28. Mass Shootings: How Mass Media, Myths, and the Government Affect People's Fear of Mass Shootings

Presenter(s): Mariana Juarez

Advisor(s): Dr. Ann Gordon

As shootings keep increasing throughout the years, so does the fear of falling victim to one. The events of mass shootings and the fear of it happening are affected by a variety of reasons, but there are three high components that lead to having this fear in the first place. In this paper, I will examine how the fear of mass shootings has been increasing due to the effects of mass media, myths, and the actions of governmental officials, while also addressing the topic of domestic terrorism. Relying on the Chapman Survey of American Fears, a representative national sample of U.S adults, I found that there is a higher fear among women, people of color, and people who are 35 and younger. These discoveries correlate with the reasons for the fear of mass shootings because the perpetrator is more likely to be a male, white, and young adult, as portrayed in the media. While I acknowledge the fear and the reasonings behind it, society often overlooks the aftermath of what happens after a mass shooting and what the fear makes you do. This fear could make us act in certain ways and cause potential conflict. As the years go by, the amount of fear and mass shootings keep increasing, yet nothing is happening to lessen the number of shootings.

29. The Effects of Sexual Assault Cases on Women and Their Mental Health

Presenter(s): Brandon Mahgerefteh

Advisor(s): Dr. Ann Gordon

This paper investigates the causes and effects relating to why women have an intense and constant fear of being sexually assaulted by a stranger. This fear is heavily based on the harsh truth that the overwhelming majority of victims in sexual assault cases are women, with men being the main perpetrators. The data source “The Chapman Survey of American Fears” backs this by providing great insight into why some people are more fearful than others when it comes to being sexually assaulted by a stranger. Furthermore, it explores how there is an underlying fear in women’s everyday thoughts, plans, and actions, causing them to fear simple tasks like filling up their gas, walking alone in public, and more. Another essential element that I discovered was the portrayal of sexual assault itself in the media. The media constantly uses these situations and crimes to attract an audience without realizing or caring what they are. In fact, the media elevates the fear of being sexually assaulted rather than educating and spreading awareness. Additionally, the evolutionary perspectives consider the phenomena of women’s inherent desire for self-preservation, and by integrating these elements into research and surveys, we can shed light on the causes of this inherent fear. It is essential to look at the effect this societal experience has on women throughout the world, and by doing so, this paper seeks to provide insight into the cause and effects of this fear, as well as the steps our society can take to foster an environment where women do not have to fear such atrocious attacks.

30. In Government We Mistrust: Partisan Fear and Media Consumption

Presenter(s): Hailey Merin

Advisor(s): Dr. Ann Gordon

In a democratic nation such as the United States, public sentiment toward government officials fluctuates with each election cycle. In the present political climate, skepticism surrounding nominees, their parties, and the integrity of elections has instilled in civilians a fear of corruption among government officials. Republican Americans have been most concerned about the possibility of corruption among government officials after the 2020 presidential election. In this paper, I aim to examine if a correlation exists between an association of political parties and a fear of corrupt government officials. Using the Seventh Annual Chapman University Survey of American Fears, this paper accounts for data surveyed within the last ten years. The American National Election Studies is used to compare previous election sentiments to the present day. Exploring this subject is meaningful because it can help campaign officers create a passive environment that does not intimidate members of differing political parties and encourages them to vote in a new way during elections. While pinpointing if correspondence exists, the underlying issue of why these relations correlate will be explored as well.

31. Horseshoe Theory in American Politics: How Much Commonality Exists Between Trump Supporters and Sanders Voters?

Presenter(s): Ethan Oppenheim

Advisor(s): Dr. John Compton

What explains the apparent similarities in policy preferences and attitudes between those on the populist right and the socialist left? “Horseshoe theory” refers to the idea that the left-right divide should be viewed as a horseshoe-shaped spectrum rather than as a linear spectrum. Thus, instead of the “far-right” and “far-left” being on opposite ends of a linear continuum, they fall on opposite ends of a horseshoe-shaped spectrum in which the political extremes are closer to each other than they are to those in the center. Existing literature does not express significant support for the so-called “horseshoe theory.” Many scholars reject it as a serious political science theory altogether. However, existing literature fails to properly define who constitutes “far-right” and “far-left” or to address specific policy issues and attitudes that may help to explain this phenomenon. Thus, I will attempt to show that the underlying principles of the theory carry legitimacy. I argue that in contemporary United States politics, there exists a trend in which there are significant overlaps in policy preferences and attitudes between party elites and voters who identify with the factions or candidates of their respective parties that are perceived to be more radical. I predict that these overlaps exist in foreign policy views, trade policy preferences, sentiments toward institutions, and antisemitic tendencies. Using public opinion data from the American National Election Study (ANES) and congressional voting records, I will analyze policy preferences of party elites and voters on the populist right and the socialist left as well as those of moderate voters and elites. My research findings will explain where in American politics, if at all, there is commonality between the populist right and socialist left. This explanation is essential in understanding why extremist movements have grown more appealing in the contemporary age of populism. Doing so is imperative so that policymakers may address these pressing concerns in order to eliminate political polarization and extremism.

32. The Evolution of Young Republicans in America: A Comparative Analysis of Young Republicans in 1980 and 2020

Presenter(s): Leia Hernandez

Advisor(s): Dr. John Compton

The Republican Party has been a topic of conversation in contemporary American politics. The party has experienced and brought forth variations in ideologies, the rise of radicalism, and demographic shifts. There is not a significant amount of research on the history of young Republicans and whether, if, and how there are any similarities and differences compared to contemporary young Republicans. The approach for this research will look into voting patterns, historical and demographic changes, and ideological patterns of young Republicans from the Election of 1980 and the 2020 Election. As well as suggest the potential possibilities of what the future of young Republican voters could look like, based on recent voting data and public opinion. The data from the American National Election Studies (ANES) will be utilized to look at variables

from each year regarding abortion and immigration opinions. The findings will be analyzed to see if there are potential patterns and to analyze similarities in young Republicans from 1980 and 2020.

33. Media Influence on Islamophobia in the United States

Presenter(s): Anastasia Athanasiadi

Advisor(s): Dr. Ann Gordon

Islamophobia has been a growing issue in the United States, especially after the 9/11 attack on the World Trade Center twin towers in 2001, from innocent people being harassed on the street or various social media platforms to a Muslim ban implemented by former President Donald Trump. The rise of online media has allowed individuals, organizations, politicians, and news outlets to post their opinions/ articles that perpetuate a fear of Muslims in the United States and worldwide. As media consumption has skyrocketed in recent years, American society has become more exposed to Islamophobic content than ever before, and its effects are undeniable. In this paper, I examine how online media consumption and demographic characteristics, such as age, gender, marital status, and more, contribute to Islamophobia in American society. Relying on the Chapman Survey of American Fears, I found that those with a higher social media consumption are more afraid of Muslims than those who limit their social media consumption or do not use social media. I also found that women were more likely to agree with the statement that Muslims are more likely to engage in terrorist activity as opposed to non-Muslims, and people in the West and South are more likely to fear Muslims compared to those living in the rest of the country. Interestingly, age does not impact how afraid one is of Muslims, while the marital status of an individual does. Eliminating Islamophobia from society is unachievable due to prejudices that are deep-rooted in society. However, when reading a post or article about Muslims, one should question who we should really be scared of- Muslims or the media.

34. Influences of Public Opinion on Immigration

Presenter(s): Sabrina Laib

Advisor(s): Dr. Ann Gordon

Immigrants, regardless of status, are portrayed as a threat to American society through the media. This paper will investigate Americans and their fear of non White immigrants and naturalized citizens through the theories of immigration threat, social identity theory, group cue, and the so-called freeloader problem. Due to the rise of xenophobic rhetoric being parroted by American politicians such as the Muslim ban enacted during the time of former President Trump's presidency, the U.S. border control's violence towards central American refugees, as well as undocumented laborers that Florida's Governor DeSantis did not want working in his state anymore, leading to a large boycott. Using the Chapman Survey of American Fears data set published in 2018-2022, a representative national sample, I find that news outlets such as Fox News and CNN elevate fear of immigrants. They related in a way that fear will increase when the cultural politics of the country is positioned in a way where the American identity is being "stolen"

or “taken over”. The scholarly contribution to this topic is the better understanding of how influential media as well as politicians and political ideology are to citizens, and how an emphasized American issue can instill fear in the minds of Americans.. I intend to understand the process of Americans who have been residing in the country for generations and how they hold themselves to carry out judgment towards those who are living in the country regardless of documentation status.

Psychology

35. How Demographics Influence Self-Image

Presenter(s): Stephanie Yu, Amy Whitmarsh, Leyla Rakshani

Advisor(s): Dr. Aaron Schurger

When creating psychological research surveys, demographics are typically recorded at the end of the primary survey. Psychologists suggest placing demographic questions at the end to omit any biases from the participants (Hughes et al., 2016). Does the placement of these types of questions influence people without them knowing? How does this apply across different ethnic groups? Can demographic question placement prime individuals in their self-rating of attractiveness and the overall impact of demographic placement on survey results? After an initial round, we wanted to see if ethnic groups would be primed differently when viewing people of the same race. We also investigated whether parents' views on beauty standards impacted them more than the American beauty standards participants grew up with. To test this question, this project will conduct five surveys, each gearing towards a specific racial group: White, Black, East/Southeast Asian, South Asian, and Hispanic. Each survey will have two versions of the study to compare self-ratings of overall attractiveness. In version one, individuals will first answer demographic questions, rate the celebrities' attractiveness of their stated racial group, and then rate their own attractiveness. In version two, participants will first rate the celebrities' attractiveness, rate their attractiveness, and then answer demographic questions. Participants primed with their demographics at the beginning rated their attractiveness lower than participants who answered them at the end. In the second round of data, we will test if ethnic groups are more impacted by seeing celebrities of their same racial group. Overall, this research will further our understanding of demographic question placement and which marginalized groups are impacted the most. This is important since many testing formats currently place demographic questions at the beginning. Thus, this research will influence not only how psychologists conduct research, but also how proctors execute standardized testing in classroom settings.

AF209A

Moderator: Dr. Jocelyn Buckner

Theatre

2:00 – 2:15 PM

The Unique Theatre of TTRPGs: Examining the Valuable Connection Between Pen-and-Paper Role-Playing Games and Performance Art Practices.

Presenter(s) Joe Mojonnier

Advisor(s): Dr. Jocelyn Buckner

Exploring, surviving in, creating, and personally growing from a make-believe world with its own set of rules is a profoundly unique experience, one which I also found working on theatrical endeavors. Dramatics aside, while reflecting on both my high school and college theatre career and my five years of avid participation in pen-and-paper role-playing games: games where players act, make choices, and improvise within a set of rules/guidelines and their own character's personification, I discovered an important connection, one which had a special distinction. In this paper, I examine the significance of system-based long/short-form table-top role-playing games[TTRPGs] as a medium that encourages self-exploration and mimesis, in addition to learning and applying various performance and social skills, akin to theatre/performance art, specifically in the case of (predominantly) non-performers. I argue for the validity of playing TTRPGs, using systems like "Dungeons and Dragons"[D&D] and "Call of Cthulhu"[COC], as it provides a platform that can emulate theatre, but with "lower stakes" (specifically in home-games), in the way that they are accessible to those who would not define themselves as "actors"/have no desire to act/do not have any experience in theatre as a performance, and can be a narrative-writing and directing medium. Examining how TTRPGs' rules and mechanics influence gameplay can be related to the pedagogy and lessons of theatre performance and the technical roles associated with creating and directing a play by collecting perspectives on the creative processes and meanings game masters[GMs] impart in their games as well as how non-performer-players respond to the medium as performance art, reveals a distinct connection between the two mediums. The value and validity of TTRPGs as a creative and performative medium will be defined far beyond the idea that "it's just a game".

2:15 – 2:30 PM

"Seeing and Hearing What Scares You: Light and Sound Design For Haunted Attractions"

Presenter(s) Ann Nopper

Advisor(s): Dr. Jocelyn Buckner

In this thesis, I am analyzing the specific design elements that create fear within us when experiencing haunted attractions, through field research from Halloween Horror Nights, Knott's Scary Farm, and Netherworld. This thesis is a collaboration with Riley Russell, together our analyses show the major collaborations between design elements in haunted houses. The research has been obtained through: interviewing individuals that participate in the installation of lighting instruments, attending and experiencing haunts, observing how the elements affects us and other attendees, video walkthroughs, photos, lighting instrument websites, and news articles. I am examining the lighting and sound design within these haunted houses. I have observed how these particular components, implemented in haunted attractions, can create terror within the attendees of these events. It is important to share the histories of these four haunt events, and how they have garnered so much love from their communities. This research has uncovered what effects light designers use to scare attendees, how lighting and sound work in conjunction to pull off a variety of scares, how both lighting and sound can immerse attendees into the narrative of a haunt, and what differentiates each haunt event from one another. The elements of design I am studying include light plots, lighting instruments, color, textures, programming of light and sound. Through this analysis, I am informing individuals on the haunt industry, and how lighting and sound play a crucial part to the stories being told throughout all haunted attractions.

2:30 – 2:45 PM

Replicating versus Preserving Greek Culture: An Exploration of Oedipus in Greece and in the United States

Presenter(s) Paola Martini

Advisor(s): Dr. Jocelyn Buckner

I grew up in Greece, where history and culture are preserved and cultivated through mandatory classes on Ancient Greek tragedies and the Ancient Greek language. In September 2022, I saw a production of Sophocles' Oedipus the King at the Getty Villa, in Los Angeles. In August 2023, I saw Oedipus at the Theater of Epidauros, in Athens. My goal is to explore how the two productions differ in staging the tragedy and portraying the Greek culture. I will be examining their purpose, taking into consideration that they were both faithful to the text and told the same story, but were produced within two different cultures; one being the original one and the other a foreign one. My goal is to produce an analysis of why cultural history in modern Greece, as opposed to the US, is not rooted in replicating ancient life, but in preserving what is already there. After establishing the history of theater and Greek tragedies, the characteristics of both productions,

and the play's and Sophocles' background, I will be discussing and comparing them in relation to their portrayal of Greek culture, through the lens of Aristotle and the semiotic theory. Aristotle in his book *The Poetics* studies Ancient Greek tragedies and sets up a model for them through which I will be examining both productions. Semiotics is the theory of signs and their relation to meaning and culture. Therefore, I will be studying the artistic choices of the two productions in terms of their meaning. Putting these together, along with the audience's response and interviews from members of the production, will allow me to evaluate the essential differences between the two performances.

2:45 – 3:00 PM

It's Not a Phase: The Impact of Comedy and the Importance of Self-Produced Work

Presenter(s) Izzy Geldbach

Advisor(s): Dr. Jocelyn Buckner

“No” is a word that aspiring talent will hear almost every day. Whether it be in Los Angeles or New York, artists will have their dreams crushed with that one word. Only 2% of actors actually make it within the profession, while the remainder are unemployed, or employed for only a year. Yet, somehow that 2% has managed to make themselves stand out. How does an aspiring artist make themselves marketable? The answer lies in originality, and showcasing oneself. Artists must accept that the entertainment industry is a business. In order for us to succeed in this business, we must involve ourselves in projects that expand our resumes. If there are no opportunities that cater to our passions, then we must create them for ourselves. Therefore, I am taking an entrepreneurial approach to create space for my work. Finding one's voice can be difficult, but I have found that mine is most powerful through comedy. The visual element of my thesis will include creating my own sketch comedy show inspired by professional comedy groups such as *The Groundings*, *Second City*, and *Upright Citizens Brigade*. The theme will center around an ultimate awkward stage of life... high school. Celebrating young artists and their works must be a larger part of pre-professional programs. Providing artists with support in their craft allows them to develop marketable skills in writing, directing, producing, and acting.

AF209C

Moderator: Dr. Jan Osborn

Computational Science

2:00 – 2:15 PM

Visualizing Transaction-Level Modeling Simulations of Deep Neural Networks

Presenter(s) Nataniel Farzan

Advisor(s): Dr. Emad Arasteh

The extensive memory requirements for new data-intensive applications such as deep neural networks (DNNs) pose the biggest challenge to deploying DNNs, especially for embedded and low-power devices with limited computing and memory resources. To meet the conflicting design goals of embedded computing systems, Electronic System-Level (ESL) design using SystemC Transaction Level Modeling (TLM) enables early modeling and simulation of software and hardware in the initial stages of design flow to estimate performance and explore the design space. However, extracting meaningful and actionable insights from complex TLM simulations is not a trivial task. In this work, we present Netmemvisual, an interactive, cross-platform visualization tool for exposing performance bottlenecks in TLM simulations of DNNs. Netmemvisual features a user-friendly graphical user interface (GUI) for building timing diagram visualizations as well as a command-line interface (CLI) for fast batch processing. We demonstrate how Netmemvisual helps system designers rapidly analyze complex TLM simulations to find memory contention. We present experimental results with two state-of-the-art computer vision DNNs: (1) GoogLeNet and (2) Single Shot MultiBox Detector (SSD). GoogLeNet has proven to be a competitive network for accurate image classification, while SSD is used for real-time object detection where it outperforms similar networks in both speed and accuracy. The preliminary results show how Netmemvisual exposes memory bottlenecks in both of these DNNs, which aid system designers in observing and visualizing memory contention early in the system design. We aim to augment Netmemvisual in the future with statistical and analytical analysis features to create a more complete performance profiling tool for DNN TLM simulations.

Digital Arts

2:15 – 2:30 PM

AI Visualization of Gendered Language and its Biases

Presenter(s) Emma Nguyen

Advisor(s): Micol Hebron

Over the past few years, artificial intelligence has integrated itself into our lives, establishing itself as one of society's most significant technological advancements. However, its increasing relevance in our society comes with new avenues for analyzing and understanding how language

can perpetuate biases, particularly gender biases. In this research, AI visualization tools, specifically Midjourney, will be employed in revealing and addressing gendered language biases. Midjourney is an image-generating AI with the ability to interpret prompts in order to create variations of images. In this case, the prompting of the AI is referring to a short text or phrase that is used by the Midjourney AI in order to produce an image result. Words contained in the prompts will individually be used in image generation. The research will be multidisciplinary, involving and incorporating studies of feminism, algorithmic programming, and digital media. Furthermore, it will examine the artistic decision-making conducted by the AI, specifically how the AI will interpret and interact with various, often vague prompts. Due to the vagueness of these prompts, the AI must make its own decisions on how to illustrate and generate the images that best represent the user's input. Research findings show that with very minimal and generalized prompting, such as "women in sports", the AI may generate images that are depicted as biased and misogynistic. These observations raise concerns about potential biases in the AI's database and programming. Future research will explore how the AI's responses may vary depending on the user's gender identity, since users of different genders may utilize different prompting syntax and language. The aim of the research is to be able to illuminate the prominence of an increase in diversity on the programming side of AI, which can reduce the amount of biased information that is being input into the AI's database.

Interdisciplinary

2:30 – 2:45 PM

NDS: (Narrative Decision System/Non Discriminate Storytelling/Never Die serum)

Presenter(s) Sujay Puri

Advisor(s):

I am creating a globally interactive multi-character CYOA story. I am allowing various internet niche groups to control the fate of their mascot character- through votes, discussion, and other abstract forms of user data (Creative interpretation, Predictive AI). I'm starting this system by creating 8 tiktok accounts that each represent a different character in the story. Each account's video content will be thematically and causally tailored towards a certain niche by using adaptive Data-Driven UX. My backend system keeps track of the user-driven decisions of all characters through comment sentiment analysis, and provides new paths for the story using an AI formulaic fate engine. these tribes are led down a rabbit holes of local understandings that can be optimized to foster understanding between certain niches. My AI predictive data model is the hand of karma built into a multi-user CYOA game. Often times when we think about polarization, the ultimate divergence point is "what experience would change your mind". Now with social media, there is a million different ideas to process and one model does not fit the archetypally unaware. Echo chambers can make people disconnected from a causal framework or state of reference that is standardized that teaches them the best ways to move in the world. Part of my system does complex sentiment analysis on ideologically challenging literature and applies the thematic

structures to these stories- and the level of integration I can do with sentiment analysis and parameter building for this system can reach large scale implications. A comprehensive dataset based in collectively determined causal binaries could be foundation for immense level of capability In a seemingly infinite amount of disciplines. This is a system that is going to address polarization and creating cohesively dynamic ideological paradigms. I would use the \$1000 grant to invest into tools for advanced analytic tools for me and my Developers to use. IBM tools can expand the scope of our project, and help us reach our goal of digital enlightenment.

Graduate Students

Interdisciplinary

1. The Experiences of Latinx faculty, staff, and students at a Predominately White Institution aspiring to become a Hispanic Serving Institution

Presenter(s): Andrew Peña

Advisor(s): Dr. Stephany Cuevas

Over recent years higher education has experienced an increase in underrepresented racial populations translating into an urge for diversity, equity, and inclusion efforts at institutions (Gasman & Samayoa, 2019). In an increasingly diverse nation, it is imperative that predominantly white institutions seeking to become Hispanic Serving Institutions acknowledge the challenges associated with this designation. The experiences of Latinx faculty, staff, and students are interconnected which impacts their success, access, and retention within higher education. Thus, fostering an inclusive and supportive environment for these populations is critical for their future success. As predominantly white institutions develop better resources for Latinx populations, institutions can create a more diverse, equitable, and inclusive environment.

This literature review presents an analysis of existing literature surrounding Latinx faculty, staff, and students. The literature review aims to also explore the interconnected experiences of these populations and how predominately white institutions can aim to better support these populations . In addition, gaps in previous research on Latinx staff success and their impact will also be examined.

Thus, the guiding questions are: What does existing literature tell us about Latinx populations? What do predominantly white institutions need to consider as they aspire to become Hispanic Serving Institutions? What are the experiences of Latinx faculty, staff, and students at predominantly white institutions ? How can institutional policies and practices be designed to promote diversity, equity, and inclusion for Latinx faculty, staff, and students?

This literature review seeks to contribute to the ongoing efforts to create a more diverse, equitable, and inclusive higher education environment for Latinx faculty, staff, and students. For this review, I searched for literature to present the obstacles Latinx populations face within institutions, along with current resources and support that positively impact Latinx populations.

Pharmacy

2. Efficacy and Safety of Ciltacabtagene Autoleucel and Idecabtagene Vicleucel in Multiple Myeloma Patients

Presenter(s): Buthainah Ghanem

Advisor(s): Dr. Enrique Seoane-Vazque, Dr. Marc L. Fleming, Dr. Lawrence M. Brown, Rosa Rodriguez-Monguio

Background: Ciltacabtagene autoleucel (cilta-cel) and idecabtagene vicleucel (ide-cel) are chimeric antigen receptor (CAR) T-cell therapies used to treat adult patients with relapsed or refractory multiple myeloma (rrMM) after at least four lines of therapy. However, no head-to-head clinical trials to compare them have been conducted.

Objective: To compare between CARTITUDE-1 and KarMMa clinical trials in terms of efficacy, safety, and patient characteristics.

Method: Overall response rate (ORR) and safety signals were compared using reporting odds ratios (RORs) with 95% confidence intervals (CIs) at $p < 0.05$. Overall survival (OS) and progression-free survival (PFS) were compared using the Kaplan–Meier method with a log-rank test. Patient characteristics were compared using the chi-square test. Statistical analyses were conducted using Microsoft Excel and R version 4.0.5.

Results: Statistically significant differences were observed between cilta-cel and ide-cel in terms of ORR, complete response (CR), OS, and PFS ($p < 0.05$). Partial response (PR) showed no statistically significant difference ($p > 0.05$). Ide-cel was significantly associated with higher incidences of any Grade ≥ 3 adverse events than cilta-cel. Cilta-cel on the other hand, was significantly associated with higher incidences of leukopenia, lymphopenia, and CRS Grade 1 & 2 than ide-cel (RORs > 1 , $p < 0.05$). Penta-drug refractory showed a statistically significant difference between cilta-cel and ide-cel clinical trials.

Conclusion: This study found that cilta-cel is a superior treatment over ide-cel with better efficacy and less incidence of serious adverse events.

Psychology

3. The Meaning of Free Will in Different Languages: Choice, Doing What You Want, and the Absence of Constraints.

Presenter(s): Alison Oliver

Advisor(s): Dr. Uri Maoz, Dr. Paulius Rimkevicius

Free will is a complex philosophical concept but is often assumed to be a psychologically universal phenomenon in the growing body of empirical research on free will. In light of recent research suggesting that the meaning of free will might be culturally dependent, we wondered whether one's native language influences the meaning of free will independent of cultural influence.

Using a novel illustration-based experimental paradigm that minimizes the potential confounds of translated questionnaires, we presented two identical online Qualtrics surveys, one French and one English, to 100 monolingual French- or English-speaking Canadians, respectively, to assess differences in free will conceptualizations in a sample differing in native language but sharing a culture. We hypothesized that English speakers might associate free will more with illustrations depicting willpower (e.g., climbing a mountain), while French speakers might associate free will more with illustrations depicting choice (e.g., deciding between pizza or pasta for dinner).

Results from approximately 100 English- and French-speaking participants revealed no language-dependent difference in free will associations. Responses from both samples indicate that free will is associated more with making a choice or performing a neutral action (e.g., walking down the street) rather than exercising one's willpower.

To delve deeper into this difference, we ran a second Qualtrics experiment that assessed two additional factors in conceptualizations of free will: the importance of (I) doing what one wants and (II) the absence of constraints. We collected data from 100 new participants (English-speaking, Canadian natives). Besides validating our novel experimental paradigm in evaluating linguistic differences, the results of our two studies suggest that French speakers and English speakers share the same concept of free will, which is most closely associated with choice, doing what one wants, and the absence of constraints.

Undergraduate Students

Art

4. The Effects of Technology and Invention on the Future of Creative Work, A Literature Study

Presenter(s): Madison Nesbit

Advisor(s): Dr. Maliheh Ghajargar

Over the past few years, a significant amount of literature has emerged on the future of creative work and changes in the creative industry caused by technological advancement, and the effects of technologies on the gendered gap in labour and the environment. There are a few major changes in the creative workforce. Firstly, one critical shift would be changes in work culture and organization of labor due to the technological substitution of human tasks. Secondly, changes to the nature of creative work and work intensity have also occurred due to a shift from manual labor to digitalized labor and automation. Lastly, skills and requirements for the labor force of the creative industries have also been affected by technological advancement. Understanding the impact of technological advancement on the labor force of critical historical eras for industrialization is significant for forecasting changes in the work organization of creative industries that will occur in the near future and their effect on the gendered division of labour and the status of the environment. It is hypothesized that changes to the creative workforce driven by technological advancement during the 19th century may predict shifts for creative work in the near future, such as increased productivity, division of labor, and degradation of work. Thus,

the purpose of this review is to examine the effects that technological advancement and early inventions have had on the creative industry. The review seeks to answer the research question: How have technological innovation and early invention affected the work organization of the creative industry? This research aim will be achieved by reviewing pre-existing literature examining the potential technologically driven shifts of work organization in the labor force from various periods to determine whether or not there is a historical influence on this growing trend.

Biochemistry and Molecular Biology

5. Characterization of ULC Pastes for Bioengineering Applications

Presenter(s): Abbygail Caine, Anne Marie Santich

Advisor(s): Dr. Andrew Lyon

In this work, we developed a set of experiments to test the physical properties of colloidal “pastes” made from ultra-low crosslinked (ULC) microgels. We are motivated by a primary goal in the field of regenerative medicine, which is to create and optimize matrices suitable for proper cell proliferation that allow for tissue regeneration. The use of microgels in this work is motivated by their potential in a plethora of applications, including biological sensors, drug delivery, and tissue engineering¹. The goal is to ultimately develop colloidal pastes suitable for applications in composites, tissue fillers, and regenerative medicine, among others. Preliminary studies have investigated the impact of paste concentrations (ratio of buffer to ULCs) on the overall paste properties. Mechanical properties of the pastes will be tested using rheological methods. The manipulation of pH will be used to analyze the effect of pH on the stability and gelation transitions of the pastes. Finally, turbidity experiments will be carried out to determine gelation temperatures by evaluating changes in the clarity of ULCs as a function of temperature. Through more detailed understanding and additional fine-tuning of ULC pastes, efforts will be made to advance the field of bioengineering research and development.

References: (1) Karg, M.; Pich, A.; Hellweg, T.; Hoare, T.; Lyon, L. A.; Crassous, J. J.; Suzuki, D.; Gumerov, R. A.; Schneider, S.; Potemkin, I. I.; Richtering, W. Nanogels and Microgels: From Model Colloids to Applications, Recent Developments, and Future Trends. *Langmuir*, 2019, 35, 6231–6255. <https://doi.org/10.1021/acs.langmuir.8b04304>.

6. Extracellular Vesicles from Bovine Milk Mitigate the LPS-Induced Reduction in the Gut Barrier Integrity in C2BBE1 Cells

Presenter(s): Sarelle Franco, Jordan Skolnick

Advisor(s): Dr. John Miklavcic

Impaired gut-barrier function is hallmark symptom in Inflammatory bowel diseases; Crohn’s disease and ulcerative colitis. Novel therapeutics which protect intestinal integrity are needed. Extracellular vesicles (EVs) are produced by all mammalian tissues and are bioactives present in many foods. These vesicles are defined as being non-replicating, originating from a parent cell,

and membrane enclosed particles which are able to release their cargo to a target cell, thus influencing gene expression. The impacts of dietary or exogenous EVs on intestinal health and homeostasis are an area of interest. These experiments aim to assess the impact of EVs on epithelial cell barrier integrity and viability. Through experimentation, it was shown that EV's play an important role in enterocyte function which aid heavily in digestion. Additionally, trials which compared intestinal cells incubated with EV's versus depletion of EV's from culture medium, showed that the lack of EV's reduced cell viability and impaired barrier function. Thus, the supplementation of EV's from bovine milk had protective effects on maintaining intestinal cell viability and membrane integrity specifically when exposed to inflammatory stimuli. Therefore, this research yields promising data suggesting that supplementation with specific dietary EV's may ameliorate processes characteristic of IBD.

7. Synthesis of Ultra-Soft Colloidal Hydrogels for Regenerative Medicine Applications

Presenter(s): Anne Marie Santich

Advisor(s): Dr. Andrew Lyon

Soft colloid particles have been demonstrated to be useful in bioengineering applications such as tissue engineering, drug delivery, and bioprinting; and the development of these biomaterials continues to be an active area of research. Importantly, the mechanical properties of those particles play a key role in their integration with, and impact on, biological systems. The mechanics of materials have been shown to impact a diverse range of processes, including hemostasis, cell proliferation, stem cell differentiation, and inflammation. Herein, I describe likely the softest and most porous colloid particles ever synthesized. Ultra-low crosslinked (ULC) microgels were synthesized via free radical polymerization of N-Isopropylacrylamide (NIPAm) and acrylic acid (AAc) in the absence of a crosslinker in a large-scale synthetic format. Without an added crosslinker, the reaction yields ultra-soft, highly deformable particles composed of >99% water. Dr. Lyon's research group has been investigating the stability and behavior of ultra-low crosslinked (ULC) microgels, but previous studies and understood behaviors have not been fully consistent with these newly synthesized super soft ULCs. Characterization of these particles using optical microscopy, atomic force microscopy (AFM), and tunable resistive pulse sensing (TRPS) is described, as well as compelling rheological properties. Overall, understanding and exploiting the super soft property of these ULCs has potential importance of bio integration for applications like wound healing, hemostasis, and regenerative medicine.

8. Thermoresponsive poly(N-isopropylacrylamide) Microgels with Cheerios Structures

Presenter(s): Nathan Mermilliod

Advisor(s): Molla Islam

Microgels are composed of a 3D porous network structure of polymers responsive to changes in temperature, pH, magnetic field, etc. They are useful for drug delivery and the controlled release of bioactive molecules. Thermoresponsive poly(N-isopropylacrylamide) (pNIPAm) microgels were synthesized by a three-step addition of monomer NIPAm within the first hour of the reaction.

These microgels are designed to be larger and synthesized without any exogenous crosslinker making them ultra-low crosslinked in density. We found that the microgel particles form cheerio-like hollow structures. We also found that these cheerio-like microgel particles are extremely robust and preserve their mechanical stability in a very high osmotic pressure. We were able to tune microgel size with concentration and step-wise addition APS initiator. This produced microgels sized at $\sim 1.3\mu\text{m}$ and $\sim 2\mu\text{m}$, both with a cheerio shape. Both large and small cheerio-like microgels are observed to retain their structure under high osmotic pressure. A high osmotic pressure environment was used to mimic cell congestion. The cheerio-like microgels' structural resilience could be useful for navigating the bloodstream. Additionally, the cheerio structure may be useful to mimic the structure of red blood cells to improve length of circulation time. We hypothesize that these cheerio-like microgels are formed during the subsequent addition of same monomers which effectively dominates the rate of the reaction at its critical growth phase. We are currently trying to understand how these particles are formed, shaped, and stabilized during the reaction.

Biological Sciences

9. Screening for Increased Cyanobacterial Growth in a Mutant Library

Presenter(s): Julian Vlad

Advisor(s): Dr. Hagop Atamian

Arthrospira platensis (*A. platensis*) is a species of cyanobacteria that uses carbon dioxide, light, and water to create glucose and oxygen, and alongside an engineered *Escherichia coli* (*E. coli*) can be used to create 2,3-butanediol (2,3-BDO), a rocket propellant that can aid in the colonization of Mars. This engineered *E. coli* uses sugars created by *A. platensis* and carbon dioxide to create 2,3-BDO. This process is limited by the reduced growth rate of *A. platensis* in the presence of high glucose concentrations. *A. platensis* cells and growth media were purchased from University of Texas at Austin Culture Collection (UTEX 3086). *A. platensis* was grown in nutrient media for seven days under continuous (24-hour) $200\ \mu\text{mol m}^{-2}\ \text{s}^{-1}$ light intensity, then was exposed to UV rays (UV-C 254nm, 15W, Philips) for 20 minutes in a sterile petri dish. The UV-irradiated cells were spread on Petri dishes with solid growth media and were grown under continuous light until colonies were formed. Individual colonies were picked and transferred to falcon tubes containing growth media supplemented with 40g/L glucose. The colonies were grown for seven days in falcon tubes and biomasses were estimated using a spectrometer at 680 nm wavelength. Subjecting *A. platensis* to UV-induced mutations created a mutant library, and we are currently screening the mutant library for strains with enhanced growth rates. Genetic analysis can be performed on mutant strains to engineer a highly productive variant, which can contribute to the sustainable production of 2,3-BDO, which can kickstart sustainable space travel.

10. Energetics of Atlantic Hagfish

Presenter(s): Lakshita Babburi, Renata Spinelli

Advisor(s): Dr. Douglas Fudge

Hagfish are agnathans slightly resembling eels that live in the deep waters of a few oceans. They feed on decaying material and are most well known for being able to slime when threatened to ward off their predators. In this series of experiments, a respirometry chamber was used to measure the oxygen consumption rates of Atlantic hagfish under different temperatures with the primary focus of observing how temperature plays a role in hagfish metabolic rate. The setup involved placing a hagfish in the respirometry chamber for around two hours to collect the necessary data. When observing the data collected from the respirometry chamber, a mostly linear decreasing line is seen that represents the amount of oxygen in the chamber decreasing because the hagfish is consuming it. The experiment was conducted under three different temperatures of 6°C, 11°C, and 16°C to see how the temperature would affect the hagfish's oxygen consumption or if the temperature affected the hagfish's oxygen consumption rate at all.

Business

11. Lady Meta and Online Avatar Fashion

Presenter(s): Alexa Morgan

Advisor(s): Dr. Cristina Nistor

In this project I am working with Professor Gokcen Balli and Professor Nistor to understand the consumer motivation for use of online avatar fashion. With the advent of NFTs and online avatars, consumers have adopted various forms of online fashion. On the business side, brands are creating online fashion both for the mass market and as unique expression of high-end luxury. For example, Nike has offered shoes in Roblox and the Metaverse fashion week showcased many high brands who are creating unique online fashion. Consumers adopt online avatar fashion and also interact with each other on sites like Discord and Reddit where they find a community to share ideas and comments. Our project aims to complete the gap for online avatar fashion consumption: I have researched the popular news sources, and analyzed a large dataset of consumer comments for a fuller picture of consumer motivations.

Chemistry

12. Developing a Lewis Acidity Scale for Redox-Inert Metal Salts

Presenter(s): Janelle Jacques

Advisor(s): Dr. Maduka Ogba

In this work, we determined the ability of different Lewis acidic salts of alkaline, alkaline earth, and redox-inert transition metals to form complexes with ammonia and fluoride ions. To achieve this, we utilized modern density functional theory (DFT) techniques. The energies resulting from

the complexation studies were used to generate two Lewis acidity scales, namely the fluoride ion affinity and ammonia affinity for these salts. These scales will serve as a tool to evaluate each Lewis acid's effectiveness in extracting fluorides from organofluorides and promoting the coupling of the organofluoride to amines to form nitrogen-rich compounds.

13. Shining Light on Automotive Brake Wear Particles: An Aerosol Light Scattering Study

Presenter(s): Dhivya Manickam

Advisor(s): Dr. Matthew Gartner

Particulate matter sized under 10 micrometers, PM10, is heavily studied as pollution due to its impacts on human health. Traffic-related pollution consists of both exhaust and non-exhaust sources (e. g. tire and brake wear), which contribute similarly to PM10. As non-electric vehicles are phased out of the automotive industry, non-exhaust emissions will remain as a significant pollution source. Monitoring these emerging sources is difficult without 'marker' properties to distinguish and quantify the emissions. Size and material properties of aerosols can be investigated by light scattering, which is a function of diameter and refractive index for PM10. Brake wear's light scattering was analyzed using a minimally explored method to obtain trends distinguishing between brake pad types and braking harshness. Automotive brake wear was simulated using a dynamometer, while a chamber housed brake components to monitor the emissions of braking events in a controlled setting. Experiments were conducted with Semi-Metallic and Ceramic brake pads, consisting of 'light braking' and 'harsh braking' regimes, and the resulting PM10 was analyzed by particle sizers. The two brake types had distinct scattering-mass relationships during the light braking regime. When normalized by particle count, Semi-Metallic brake wear had a precise, reproducible scattering property distinct from other aerosols. Harsh braking events increased rotor temperature past the point of thermal degradation of the brake pads. Brake wear particles generated during harsh braking exhibited similar scattering intensity as light braking, but indicated an increase in size or density. The identification of light scattering as a 'marker' property of brake wear is crucial to future efforts in monitoring and examining non-exhaust emissions.

14. Sequential One-Pot Oxidative Boron-Heck and Heck Reactions to Generate Disubstituted Arenes

Presenter(s): Nyssa Arai

Advisor(s): Dr. Justin O'Neill

The Heck reaction, described generally as the vinylation or arylation of olefins is extensively used in chemical synthesis owing to its efficiency, versatility, and simplicity. Heck methodology can accommodate a wide variety of olefins, catalysts, and other reaction parameters making it adaptable to diverse synthetic needs. Ongoing interest in optimizing Heck reactions in specific applications have brought about improvements such as the reduction of synthesis steps, the elimination of protection/deprotection procedures, increased selectivity, efficiency and yield. In particular, procedures for one-pot tandem processes in Pd-catalyzed oxidative boron-Heck type

and Suzuki reactions have been developed to circumvent the need for purification or additional catalyst between steps. O'Neill et al. (2008) reported moderate to good yields of biaryl derivatives synthesized via this approach with substrate variability. One-pot synthesis of biaryls can further benefit from using appropriate mechanisms in each step. In a similar work, O'Neill found that asymmetric coupling between trisubstituted linear olefins and arylboronic acids via oxidative Heck-type chemistry along with the use of chiral bidentate nitrogenous ligands resulted in yields and enantioselectivities superior to previously known studies at the time. In this study, the potential to similarly optimize a sequential boron-Heck and Heck reaction is explored with these prior works on boron-Heck and Suzuki serving as a foundation.

Communication Studies

15. Cancel Culture and Self-Esteem

Presenter(s): Ava Izadi, Riley Dizon, Nicki Koerwer, Chris Rossal, Lucas Dante

Advisor(s): Dr. Rebecca Forster

The goal of our study is to measure how an individual's participation, or lack thereof, in cancel culture of celebrities they follow in the media is correlated to their own feelings of self-esteem and self worth. We hope to prove that a person's image of themselves (either positive or negative) has an impact on how they treat a famous person they like who has misbehaved in some way.

It is important to study and manipulate self-esteem because of the importance self-esteem has on our daily lives, such as how it affects our actions, decision making, morals, etc. It is also important to study cancel culture as a phenomenon, because of its effect on social media and society as a whole. The impact that cancel culture has on our generation's image of self worth is important in understanding, as social media and the internet continues to advance and take a greater role in our lives.

We hypothesize that individuals with lower self-esteem are more likely to participate in cancel culture than individuals with high self-esteem. People with low self-esteem tend to think negatively and speak negatively about others. Because cancel culture is entirely negative, the two variables are directly related.

We also hypothesize that after participating in cancel culture, individuals will experience higher levels of self esteem than individuals who did not participate in cancel culture. When people speak down on other people, they tend to feed their own ego, so their self esteem goes up.

In order to test our two hypotheses, we will manipulate the participants' self esteem. Participants who are not manipulated will act as the control, seeing what their opinions on cancel culture are based on a made-up scenario. Next we will go through the process of manipulating their self esteem by asking them to write about things that either make them feel good about themselves or aspects that they may feel insecure about or that they may be sensitive to. Once we conduct these procedures, we will continue with our surveys and questioning to see how their opinions on cancel culture have changed.

Computer Science

16. User Feedback on Celebratory Technology Model for Reducing Stigma

Presenter(s): Evelyn Lawrie, Daniel Dinh, Sav Avalo, Jack de Bruyn, Spencer Au, Christian Lopez, Cyrus Fa'amafoe, Ray Tan

Advisor(s): Dr. LouAnne Boyd

Social stigma is a complex manifestation that affects humanity, particularly individuals with disabilities and other marginalized groups, including those with physical, cognitive, and emotional conditions. Society often judges these individuals' interactions with the world, and many technologies designed to assist those with disabilities attempt to change their daily interactions and behaviors. Nonetheless, when the emphasis is placed on validating disabled identities, there is a potential for it to be seen as "inspiration porn." This approach might inadvertently reduce inclusivity and do little to challenge negative stereotypes; it can also lead to the objectification of individuals with disabilities. Therefore, this project presents the notion of "Celebratory Technologies for Neurodiversity," which aims to promote inclusivity and empower stigmatized individuals. This concept strives to level the playing field, rather than serving as a solitary source of inspiration for nondisabled observers. In this context, a Figma diagram and a user survey were created using Maze to gather feedback from students at Chapman University on the concept of Celebratory Technology. This valuable input will help refine and develop Celebratory Technologies for Neurodiversity, drawing upon social change frameworks, principles of the Neurodiversity movement, and insights from marginalized groups on how to reduce stigma. The Figma prototype introduces Celebratory Technology in the form of a colorful visual representation of the participants' answers to a personality survey, with the goal of showcasing users from different backgrounds and identities in an abstract way. This in turn has a goal of celebrating uniqueness and individuality without implementing labels or alienation. This project serves as a preliminary step in introducing Celebratory Technology and aims to expand the conversation of ways to mitigate social stigma. Initial suggestions for creating supportive Celebratory Technologies for Neurodiversity are provided in this project.

Data Analytics

17. From Beats to Bytes: An Interdisciplinary Exploration and Analysis of Quantitative Elements of House Music to Forecast the Sound of the Future.

Presenter(s): Marcelo De La Maza

Advisor(s): Dr. Kaan Ataman

This research project aimed to address how House music has evolved over the past four decades and predict its future trajectory. To achieve this, I collected and analyzed audio features of House tracks from 1986 to 2023 using the Spotify Web API. By examining 12 quantifiable audio features, I delved into the quantitative aspects of House music's development.

I gathered a comprehensive dataset comprising 1,900 tracks and 26,600 data points by selecting 50 tracks from each year based on popularity rankings from RateYourMusic (RYM). RYM's extensive music database and user-generated reviews made it a reliable source for my study.

The data analysis was conducted in three stages. In the first stage, I used regression analysis to identify trends within four-year intervals, providing nine data sets. The second stage involved comparing data from different time frames to uncover relationships and contextualize my findings within political, social, and cultural events. In the final stage, I forecasted the future of House music by creating trend graphs for each audio feature, predicting how House music would sound 4, 8, and 12 years from then.

The project's results not only contributed to the understanding of House music's historical evolution but also provided insights into its future trends. As part of my project, I used the results to produce a House track predicting what music will sound like in the future. This creative endeavor was presented alongside my research findings, offering a unique blend of data-driven analysis and artistic expression.

By combining data analysis and artistic production, this project shed light on the musical past and future of House music, making it a valuable contribution to the field of musicology and offering a glimpse into the ever-evolving world of electronic music.

Economics

18. Who is Most Likely to Fear Economic Recessions? Demographic Fears of Recessions based on SES status, Homeownership, Income and More

Presenter(s): Robert Hutchens

Advisor(s): Dr. Ann Gordon

The United States has the largest economy in the world and yet Americans are often worried or concerned about the state of the economy and the effect of the economy on their lives. In this paper I examine the complex relationships between groups of people and their fear and opinion of the economy; specifically looking into the rationale and influences behind those opinions. Using the 2020 ANES Time Series Study and the Chapman University American Fears Survey, I find a strong correlation between high economic status and fear of recessions, as well as a higher sense of fear amongst those in the lower SES range. The middle class appears to be an odd outlier when it comes to fear of economic collapse. Age, marriage, and employment status also are shown to effect opinion and concern of the American economy. I find that low income and unemployed Americans are more likely to fear economic collapse due to their already unfortunate financial position, and lack of backup capital. I also find that homeowners are more worrisome about the economy than non-homeowners due to their investments in real estate. Finally, I find that those in the top of the SES are more likely to fear economic downturns than the middle class due to their larger investments in the financial markets and real estate. Although a future of perfect economic stability in the United States is unrealistic, the impact and reasoning behind

fear of the economy itself may influence Americans to think about how they view the economy and their financial decisions moving forward.

Engineering

19. The Roadmap to an Improved Braille Display Design

Presenter(s): Michael Cheng, Trey Alexander, Emma Garofalo, Luke Shankland, Michael Smith

Advisor(s): Dr. Maryam Etezad

This research focuses on the comprehensive design, development, and evaluation of a refreshable Braille display capable of rendering up to six Braille letters simultaneously. The project began with the creation of a 3D-printed prototype of Braille displays, which served as the foundational basis for subsequent design iterations. To ensure the efficacy and usability of the proposed design, a user testing phase was conducted in collaboration with visually impaired individuals at a local Braille school. Feedback was collected from a cohort of eight visually impaired participants, and their invaluable insights played a pivotal role in shaping the final device design to maximize usability and readability. This poster presents the journey of the prototype, transitioning from its initial 3D-printed form to its current functional version. The iterative design process is highlighted, emphasizing the integration of user feedback throughout the development cycle. Significant emphasis was placed on optimizing tactile feedback mechanisms, employing piezoelectric actuators to precisely manipulate Braille dots corresponding to the letters of a computer keyboard. As part of our future work, we are focusing on the integration of enhanced tactile feedback with shape representation. This research holds promise for improving the quality of life and independence of individuals with visual impairments.

20. Superradiance Through a Rotating Acoustic Absorber

Presenter(s): Sergio Torres

Advisor(s): Dr. Nasim Mohammadi Estakhri

In 1969, Roger Penrose theorized that energy could be extracted from a rotating black hole. He believed a mass co-rotating with the black hole could be lowered into the center of the black hole to extract said energy. In 1971, another scientist, Yakov Zel'Dovich, expanded on this idea and applied it to a rotating absorber. Zel'Dovich mathematically demonstrated that a rotating absorber could amplify incident electromagnetic waves that had angular momentum but only under certain conditions: the incident wave frequency should be less than the order of the orbital angular momentum times the rotation rate of the absorber. This condition, is known as the Zel'Dovich condition. Unfortunately technological limitations prevent us from conducting experiments directly with black holes and with light waves, but we can conduct an analogue experiment with acoustics. Sound waves behave similarly to light waves, albeit at a much slower velocity, which in return imposes much less limitations for us in this realm. In this work we will present the result of our work on experimental implementation of the Superradiance in acoustics.

Our experiment involved designing, building, manufacturing, and wiring components to create a speaker array, a microphone array, acoustic wave guides, and multiple designs of acoustic absorbers. By mounting the waveguides to the speaker array, we can channel the sound waves straight onto the acoustic absorber. The acoustic absorber would be mounted on to a motor. The motor would spin the acoustic absorber at a rate faster than the incident sound wave frequency which would allow us to meet the Zel'Dovich condition. Based on similar experiments, we expect a 30% amplification of the soundwave.

21. Analysis and Construction of Infrared-responsive Materials for 3D Printing

Presenter(s): Trey Alexander

Advisor(s): Dr. Nasim Estakhri

The purpose of this project was to investigate and characterize 3D printed materials within the infrared spectrum. In doing so we were looking to expand on previous research in this field that investigated a specific PLA blend of infrared material, and see what in the material contributes to its classification. Using a spectrometer we developed a method of comparing the absorption across the short-wavelength infrared spectrum of different layerings of standard 3D printing materials, the infrared material discussed in the previous research, as well as a mixture of resin and gold to investigate properties of gold's infrared capabilities when mixed into 3D printed material. By looking at the absorption spectrum we could identify which materials could be viewed under infrared cameras as low absorption would indicate transmission of infrared radiation and thus the ability to be visible under infrared cameras. In analyzing the spectroscopy scans it was found that of the material scanned within the transmitted wavelength of 1353nm - 2447nm only one material partially followed the lower absorption values and curve along the absorption spectrum as the infrared material: the resin and resin/gold mixture. This observed phenomena suggested that the combination of gold and resin can be used as a platform to engineer the infrared capabilities of 3D printed materials.

English

22. The Immigrant Motherhood Experience in France

Presenter(s): Mariana Juarez

Advisor(s): Dr. Ian Barnard

Immigrants have been treated unfairly in various parts of the world. While most go to a different country to fulfill their dream or for safety reasons, they are all treated the same—unwanted. While most create and start families in new countries, they often experience two of the hardest systems while doing so, motherhood and immigration. Saint Omer spans around a Senegalese immigrant woman in France, Laurence Coly, who stands trial for the infanticide of her daughter, Elise. Throughout her trial, Laurence shows the complex systems of motherhood and immigration as she portrays the emotions and struggles she's faced since coming to France. The film, Saint Omer, is a perfect example of the complexities that is motherhood and the breakdown Laurence

faced when she came to France. We often see Laurence struggle within herself on whether she is a monster or a victim of the motherhood system. This project will focus on the motherhood system in Europe, specifically France, and how Laurence tried to fit into these standards while also talking about the immigrant experience and addressing the racism that most face when moving to a new country. I will also resolve the question that lingers, is Laurence truly innocent of her crime?

23. Emily Dickinson: Erasure, Recovery, and Queer Joy

Presenter(s): Olivia Schultz

Advisor(s): Dr. Ian Barnard

My presentation will focus on bringing light to the queer history of Emily Dickinson's work and the recovery of her history within the greater context of queer authors of the 19th century/the American canon. Dickinson is one of the authors whose work I dove into as a part of my class on 19th-century queer authors and I became engrossed in her poetry and the poetry within the letters she sent to Susan Gilbert. I wish to create an educational poster that allows me to teach others not only about the beautiful works and queer context of Dickinson's poetry but also about how queer history is often erased in literature to preserve the idea/ideal of American authors. I want to explore both the literal erasure of Dickinson's queerness in the early publishings of her work and the hope that comes in the study and recovery of old works with new technology that allow what would've otherwise been lost to time to come back into the light. This is a presentation about Emily Dickinson, about the contents of her letters to Sue, about her unique way of formatting her works, about the joy of her life so often forgotten when people tell her history, but it's also a case study; this is a presentation on how queer authors have impacted the great American literary canon, how queerness always has been a part of history, and how the preservation of that history is vital to truly understanding it.

24. Birth of the Magic Baby: An Exploration of Motherhood and Anti-Abortion Sentiments in Young Adult Fiction

Presenter(s): Kylee Schwartz

Advisor(s): Dr. Julye Bidmead

A new literary trend is being born in the young adult fiction genre: the female protagonist and her Magic Baby. In this trope, young, white, economically stable female protagonists in relationships have an unplanned pregnancy that jeopardizes both the mother's and child's life. After the mother prioritizes the child's life, she is rewarded with a beautiful, supernaturally gifted baby. The birth, idealized qualities of the Magic Baby, and the baby's relationship with their mother reveal harmful anti-abortion sentiments; an obligation to keep the baby despite dangers to the mother's life due to the child's future potential, a glorification of life-endangering birth, and the idealization of self-sacrifice in motherhood that devalues the woman. Under the lens of anti-abortion and abortion arguments, the interpretation of novels containing *The Magic Baby*, *Breaking Dawn*, *A Court of Silver Flames*, and *The Scarlet Letter*, in conjuncture with peer-

reviewed research papers based on teen pregnancy portrayals, stereotypes in young adult fiction, and how stories influence people, will be guiding the analysis. Overall, these extremely popular novels set a disturbing precedent by portraying unrealistic, dangerous, and anti-abortion expectations and valued qualities of motherhood, influencing young women's perceptions of motherhood. The "Magic Baby" model of the perfect mother comes at the expense of real women.

Environmental Science and Policy

25. Búsqueda de babosas marinas: Understanding Barriers of Environmental Literacy and Climate Advocacy within Southern California Spanish-Speakers

Presenter(s): Cintya Felix Ashley, Lam Lorena Muñoz, Micah Kim

Advisor(s): Dr. Gabrielle Keeler-May, Dr. Richelle Tanner

The Hispanic and Latino populations are the largest ethnic minority in California, and more than 10.4 million Californians consider Spanish their first language. However, English is the primary language in most educational and public spaces. This means Spanish-speaking communities have limited access to coastal ecosystems and learning opportunities about coastal areas impacted by climate change and extreme weather, which becomes a barrier to civic engagement, climate advocacy, and local decision-making. During the 2023 summer, we partnered with local climate advocacy organizations and held educational programs at two public beaches in southern California. The presentations in English and Spanish taught foundational environmental information to participants, followed by tidepool exploration. We surveyed participants at the events to understand whether participatory science events affect climate advocacy and environmental literacy. We also assessed if demographic factors, including education level, income, and age, impacted their outcomes. Using data obtained from the pre and post-survey, we hypothesized the participatory science events would increase environmental literacy and climate advocacy levels among young adults in the range of 18-24 years of age and those whose primary and/or only language is not English. Ultimately, we show that educational programming targeting non-English speaking communities has tremendous power to challenge low environmental literacy rates and lacking civic engagement within intersectional and underrepresented populations. Therefore, the active creation and funding for systems supporting environmental education and advocacy action are key to moving beyond the traditional realm of what has historically been the norm in American society.

26. Tracking the Fate of Fermentable Substrates: The Effects of Glucose and Glucose-polymers on Anaerobic Carbon Cycling in Peatland Soils

Presenter(s): Jocelyn Valdivia

Advisor(s): Dr. Jason Keller, Dr. Cassandra Zalman

Understanding the amount of carbon dioxide (CO₂) and methane (CH₄) produced by microbial anaerobic decomposition within peatlands is key for understanding peatland-climate feedbacks.

In theory, the anaerobic microbial decomposition of fermentable substrates (e.g., glucose) should produce a 1:1 ratio of CO₂:CH₄ to achieve both carbon and charge balance. However, this ratio is rarely seen in peatland soils for reasons which are not fully understood. In this study, we anaerobically collected surface soil from two Sphagnum-dominated peatlands in northern Minnesota and amended them with either glucose or dextran (a glucose polymer) of three different molecular weights. All treatments contained the same amount of carbon. Following the carbon substrate addition, the soils were anaerobically incubated at 15 degrees Celsius. Concentrations and delta 13C of CO₂ and CH₄ as well as dissolved concentrations of acetate (and other low molecular weight organic compounds) were measured periodically. After four weeks of incubation, the first soil had a 0-15% recovery of the added carbon in the form of greenhouse gasses. This excess recovered carbon resulted in a CO₂:CH₄ ratio ranging from 2.4:1 to 5.5:1 for amended soils in comparison to the control treatment with a 1.7:1 ratio. The second soil resulted in a 29-45% recovery of the added carbon in the form of greenhouse gasses. The CO₂:CH₄ ratio of recovered substrates was more constrained, and closer to the theoretical value, it ranged from 1.1:1 to 1.8:1 while the control treatment resulted in a 1.0:1 ratio. In the second soil, larger dextran molecules had higher percent recovery and higher CO₂:CH₄ ratios. Results to date highlight that fermentable substrates with similar chemical composition are decomposed differently in peatland soils.

27. Optimizing Nutrient Uptake: Understanding Cost Functions of the FUN Model through Innovative Cost Parameter Analysis

Presenter(s): Gabriel Alpay

Advisor(s): Dr. Joshua Fisher

This study explores the cost functions of the FUN model, which aims to optimize the amount of carbon used when plants acquire their necessary nutrients from the soil to maximize nitrogen and phosphorus uptake while minimizing the carbon cost, more specifically, the complex relationship of cost parameters belonging to the cost of nitrogen and phosphorus uptake functions by Arbuscular Mycorrhizal and Ectomycorrhizal fungi with the goal of understanding nutrient cycling better. As a part of the methodology, this study presents three dimensions of sensitivity analysis done to the cost parameters; additionally, this study also examines outcome variations by graphing observed versus modeled data using linear regressions. When analyzing the cost of resorption of leaf phosphorus, increasing the kR cost parameter decreased the R² value, while the model for nitrogen remained stable in the first dimension. Holding one cost parameter constant while changing the other in the second dimension increased the model's sensitivity to changes in both phosphorus and nitrogen. Switching the cost parameter being held in the third dimension yielded similar findings, highlighting the model's sensitivity to changes. The observed versus modeled graphs showed some exciting results; as the 'kR' value increased, the model's predictions became lower than actual values, with a larger residual spread; this caused an unexpected pattern and introduced uncertainty in the predictions, with a more negative bias and increased RMSE. This study aligns with and builds upon previous research in

the field, emphasizing the need to perform sensitivity analysis further to enhance predictive accuracy.

28. Comparing Past and Future Drought and Surplus Periods in the Colorado River Basin

Presenter(s): Rama Bedri

Advisor(s): Dr. Thomas Piechota

The Colorado River Basin is crucial to the Western United States, providing water for seven states and Mexico. Historical and future periods of drought and surplus in the Colorado River Basin are analyzed based on eight climate scenarios in 17 stations. Unimpaired streamflow data are evaluated from the U.S. Geological Survey, Bureau of Reclamation, and Coupled Modeled Intercomparison Projection 5 from 1950-2099. Future projections are based on eight climate scenarios comprising four climate models (HadGEM2-ES, CNRM-CM5, CanESM2, MI-ROC5) observed at Representative Concentration Pathways (RCP) 4.5 and 8.5 emission scenarios. Drought (surplus) quantities, magnitudes, severities, and water year flows are compared for the historical and future periods. Furthermore, the ensemble water year means of the models are analyzed. Results indicate that there is a significant difference between the historical record and future projections. The results are not consistent in terms of increase of drought or surplus; however, the intensity (as measured by magnitude and duration) will likely increase for both RCP 4.5 and 8.5. The CanESM2 and CNRM-CM5 models project wetter scenarios, and HadGEM2 and MI-ROC5 models project drier scenarios. For the critical Lees Ferry station, models indicate a chance of higher drought and surplus length and magnitude on the order of two times the historical period. In addition, basin-wide flow at Lees Ferry had a shift in the future mean ensemble of approximately 3–10% for the water year. Future hydrologic changes will heighten the need for appropriate water management and infrastructure options available to adapt to the changing climate.

Health Sciences and Kinesiology

29. Ambulation App For Stroke Patients

Presenter(s): Mikayla Peterson

Advisor(s): Dr. Soangra Rahul

Stroke patients have a high risk of falling. 7% of falls occur in the first week after stroke when the patient is still in the hospital. Post stroke studies show that up to 37% of patients fall between 1 and 6 months and up to 73% of patients fall one year after a stroke. This study investigates usability of an app, which is designed to assess and quantify fall risk of stroke survivor based on their gait and posture transition patterns. The patients will complete a series of outpatient therapy sessions in which they use the app to track their ambulation patterns while standing, taking steps, and completing a 360° rotation. They will continue participating in the trial from their homes for up to 4 months, using the app to collect data for these movements weekly. When the trial concludes, the raw data will be used to create machine learning classification models for

evaluating fall risk, and then encoded into the app. Early fall risk identification can allow caretakers to take preventive steps towards avoiding a fall, which has the potential to severely impact quality of life. It also allows the patient to maintain independence when they're not at risk of falling. The ultimate goal is to prioritize patient safety while also promoting autonomy. We are utilizing multiple valid mobile Health scales for assessment of ease of use and usability of the App. The planned experiment will involve stroke survivors who would rate the App for ease of use and usability. first round of data collection has begun, where healthy adults are providing a baseline.

Integrated Educational Studies

30. The Impact of External Community Factors on Urban Youth Behaviors

Presenter(s): Erin Simmons

Advisor(s): Dr. Quaylan Allen

In what ways are urban youth behaviors in educational settings influenced by external community factors and experiences? It is important for educators to understand a student's holistic experience such as their home dynamics, surrounding community, and the unique circumstances they endure. This is especially true for children in urban communities that are exposed to systemic oppressions given that their experiences encompass higher levels of trauma, adversities, abuse, single-parent households, poverty, etc. It has been found in previous literature that students exposed to higher levels of adversities will externalize their experiences through, what is perceived as, "disruptive" behaviors in the classroom as their method of defense against their environment. Highly punished actions within academic spaces are often reflective of the many emotions a child feels in response to their triggering experiences but are unable to communicate. Researchers have noted that educators that label urban youth behaviors opposed to understanding their experience often re-trigger students and perpetuate the academic achievement gap found in urban communities. This study will build upon this body of research literature through identifying specific in-classroom behaviors and experiences to further the guide to understanding, predicting, and intervening with students' behaviors properly. This will serve to support urban youth's academic success and social interactions through adolescence and early adulthood. The methodology for this study consists of a qualitative approach that involves interviews and observations. There will be one focus group for educators at a local non-profit afterschool program followed by observations and interactions with the youth. Select youth will be invited to be interviewed based on the unique behaviors observed accompanied with an interview with their guardian to understand their personal home situation. It is expected that students who are reprimanded more than their peers will display unique behaviors that reflect their adverse experiences.

Music

31. Modular Synthesis for Dummies: The DIY Journey

Presenter(s): Julian Berger

Advisor(s): Dr. Jessica Sternfeld, Adam Borecki

Flashing modules and over fifty cables overlapping one another. What emits is an infinitely changing sound; moved by invisible hands. This mammoth electronic instrument is a modular synthesizer and has been around for over eighty years. Only over the last two to three decades has it become mainstream and used in compositions by everyday musicians. This paper examines the history of modular synthesis, from Buchla and Moog, to Doepfer and the Eurorack model, which is now the staple of modular synthesis. I teach you the fundamentals of sound synthesis, and why every musician in school should learn it. And finally, I provide a step-by-step guide to begin building your own modular synthesizer, using the site Aisynthesis.com as a framework. I've built five modules to showcase a basic routing of a sound wave that can be manipulated by an ADSR envelope. As modular is highly scalable, and Aisynthesis provides links to source the materials yourself, you will have no trouble starting and completing your first module for as little as fifty dollars in under an hour. Welcome to the world of modular.

Physics

32. Characterization of 3D printing Materials in the X-Band

Presenter(s): Guadalupe Torres

Advisor(s): Dr. Nasim Mohammadi Estakhri

This project was designed to observe and characterize the impact of the infill percentage of typical 3-D printing material, i.e., Polylactic Acid (PLA), on how an antenna wave travels through the 3-D printing material. We used RF waveguides (premade by Pasternack) as sample holders and the dimensions for all waveguides were standard WR90 dimensions with the lengths; 9in, 6in, 3in, and 9.78mm (shim). These waveguides were attached to two coaxial cables connected to the Keysight Network Analyzer using a Type N(f) adapter. The design of the print was reduced by 0.025mm in height and 0.045mm in width, then adjusted at the desired lengths. With these dimensions, the print was able to sit inside the waveguide comfortably without slipping out regardless of the infill percentage. We tested each waveguide design at increments of 10% infill starting from 0% until 100% with a rectilinear pattern. The network analyzer measures the scattering parameters (S-parameters) for the sample, which is then transferred to the effective permittivity of the material. The measurements were able to determine the impact of the infill over a range of frequencies (8.2-12.4 GHz). Our results concluded that at 100% infill, we had an effective relative permittivity of 2.7. As the infill decreased the results dropped to about 1 which is the relative permittivity of air. An interesting observation made was in regard to consistency. As the waveguide got longer the measurements would fluctuate and not match a reasonable

approximation taken from our formula for linear estimation: $(2.69 * \text{infill} + (100 - \text{infill})) / 100$. We predict that this inconsistency is because of a print infill error (inconsistency of PLA distribution within each layer that creates blockages or holes for the wave). Overall, we were able to establish a series of suitable waveguides that achieve physically meaningful results, also close to our predicted calculations at all infill.

Political Science

33. The Far-Right Political Parties of the European Union in the Contexts of Immigration and Terrorism

Presenter(s): Sage McCarty

Advisor(s): Dr. Andrea Molle

Immigration levels and far-right electoral support are rising among European Union member countries during a period tarnished by the spread of fascism and the perpetration of acts of terrorism. In Europe, some policymakers connect violence to immigration (Jafarnia 2019), and anti-immigrant views have long permeated Europe's far-right parties (Rodríguez-Aguilera 2014, 178; Henley, 2023); this indicates a need to analyze whether an increased number of terrorist attacks and/or increased levels of immigration can be used as predictors for far-right electoral support, based on the idea that people may be more inclined to support far-right political parties in a context of increased immigration, due to concerns over the stability of one's livelihood (Golder 2016, 484), and/or more inclined to support these parties in a context of an increased number of terrorist attacks, due to security fears (Carreras and Visconti 2022). Considering how far-right electoral successes may lead to international political instability and restrictions of civil rights, this project seeks to understand motivations for far-right support in Europe by exploring whether variables related to immigration and terrorism can be properly used as predictors for far-right electoral successes, as measured by the percentage of the total vote that was cast for the far-right in a given country in elections for the European Parliament. However, analyses using correlations and linear regression reveal that a European Union member country's numbers of terrorist attacks, terrorism-related arrests, and incoming migrants each year are not suitable predictors for the percentage of the vote in a country that is cast for the far-right in European Parliament elections during the following year, exposing a need for further research on whether more specific variables related to immigration and/or terrorism are correlated with far-right electoral success.

34. Understanding Gun Beliefs in America: The Impact of Political Affiliation, Gender, and Education

Presenter(s): Cyril Kobey

Advisor(s): Dr. Ann Gordon

In the United States, the debate over firearms and ammunition rights has persisted for a long time. Over the last decade, there have been 4,283 mass shootings recorded by the Gun Violence

Archive (GVA), resulting in the loss of children, parents, and grandparents. Despite some legislative efforts at both state and federal levels, there has been limited progress in stopping this ongoing violence. This research examines the factors influencing the concerns of Americans with lower education regarding restrictions on firearms and ammunition. It also explores the motivations behind women purchasing firearms out of fear. Additionally, the research looks into the relationship between the Republican political ideology and the push for more relaxed gun restrictions following a mass shooting. Relying on the Chapman Survey of American Fears and the American National Election Studies, a representative national sample of U.S. adults, I found a correlation between higher education levels and decreased fear of restrictions on firearms and ammunition. Furthermore, it demonstrates that women are more likely to acquire firearms out of fear, while Republicans tend to prioritize gun rights over gun control after a mass shooting. These fears are rooted in concerns about personal safety, the preservation of constitutional rights, and skepticism toward government intervention. Among the notable findings, education and gender are crucial in shaping individuals' attitudes toward gun ownership and reasons for purchasing a gun. Findings also show that Republicans are more likely to introduce legislation that eases gun purchasing following mass shootings. Despite the ongoing debate on gun control in American society, the research suggests that citizens will continue to acquire firearms for various reasons and will continue to make it easier to purchase guns.

35. Exploring Varied Racial Economic Evaluations on Voter Turnout and Vote Choice

Presenter(s): Dakota Holm

Advisor(s): Dr. Ann Gordon

While the 2020 presidential election in the United States saw a significant surge in voter turnout, the historical gap between white and nonwhite voter turnout remains. Voters evaluate the condition of the economy based on their own individual pocketbooks, known as “egotropic” voting, or based on how the country is doing as a whole economically, which is known as “sociotropic” voting. For my research, I will investigate the relationship between voters' perceptions of the economy with voter turnout and vote choice in the 2020 presidential election among white (non-Hispanic) and black (non-Hispanic) Americans. Relying on the 2023 Chapman Survey of American Fears, a representative national sample of U.S. adults, I believe that racial inequality in the United States, tied with egotropic and sociotropic evaluations of the economy, may explain disparities between white and black voter turnout and vote choice. I expect the relationship because statistics gathered in a 2022 report from the U.S. Department of the Treasury show that large disparities in education between white Americans and black Americans start early in kindergarten, and continue in higher education. These educational disparities lead to significant disparities in economic security between white Americans and black Americans. Among the interesting findings from FEAR IX, I found that among independent variables of income, education, and gender, each layered individually with the independent race variables of white (non-Hispanic) and black (non-Hispanic), both races have statistically significant relationships between both lower income (under \$50,000) and education (college educated or

not), and an egotropic evaluation of the economy at .005 and <.001 for blacks and whites respectively regarding income and both races <.001 for education. This is important research because the issue of whether Americans vote or not reflects how accountable we are in upholding our democracy.

36. The State of American Democracy: Voter Fraud, Capitol Attack, Political Polarization

Presenter(s): Jiya Kathuria

Advisor(s): Dr. Ann Gordon

The allegations of voter fraud in the 2020 U.S. presidential election caused national political polarization leading to violence on 6th January 2021, thus threatening the fabric of American democracy due to both major political parties promoting conflicting narratives about the integrity of the electoral process. In this paper, I examine the link between party identification and the public perception of the events surrounding the election (i.e., election results, capitol attack, allegations of voter fraud). With reference to an original data set from the Chapman Survey of American Fears containing over a thousand participants conducted from 5th to 15th April 2022, I find a strong relationship between those with conservative ideology and those who believe the allegations of voter fraud thus contesting the results of the election. This demonstrates the magnitude of influence that powerful political figures combined with media news outlets possess and exercise. The data analysis reveals that individuals' political ideology is a strong indicator of their beliefs about the election. This is consistent with previous research which states that people frequently employ partisan lenses for interpretation, which serves to confirm their pre-existing beliefs. The impact of the political polarization on American democracy cannot be emphasized enough because it hinders government efficiency, breeds distrust among citizens, promotes extremism, and obstructs bipartisan cooperation on national issues which endangers the stability of the democratic system.

37. The American Apocalyptic Paradox: An Evaluation of Religiosity and Belief in End-of-World Scenarios and Their Functions in Shaping American Environmental Anxieties and Beliefs.

Presenter(s): Samantha Daniels

Advisor(s): Dr. Ann Gordon

Intertwining perspectives on potential world-ending disasters offers a compelling lens through which to examine the intersection of existential concerns, religiosity, and beliefs regarding climate change. In this paper, I explore the extent to which self-proclaimed religiosity and biblical literalism strengthen the belief in apocalyptic end-of-world scenarios. Relying on the Chapman Survey of American Fears, a representative national sample of U.S. adults, I expect to find a moderately strong, positive relationship between religiosity and belief in future occurrences of cataclysmic events. This paper will explore how religious individuals view the imminency of potential armageddon or the occurrence of an extreme natural disaster. The answers to these relationships will help to unpack the effect of religion on fears of natural disasters and gain insight

into these individuals' beliefs in the impacts of climate change. Religiosity heavily shapes individuals' voting decisions. Religious relationships to various doomsday scenarios can potentially reveal a profound effect on our political landscape. Religious beliefs regarding the future of humanity may influence our approach to global crises. These findings could be instrumental in understanding how religious communities react to potential global disasters, particularly climate change.

38. The Impact of Generational Status on Latino Voting Behavior in the United States.

Presenter(s): Isabella Stoddart

Advisor(s): Dr. John Compton

In recent years, there has been a notable divergence in the voting behavior of Latinos and Hispanics in the United States across generations, including an uptick in Republican vote share in regions such as South Florida. There has been a lack of consensus as to why this is occurring and literature seeking to explain this phenomenon has been limited in its evaluations and has failed to control for variables such as age, gender, education level, and religiosity. There has also been an overemphasis on the role political assimilation and voter participation play for this minority group. This study theorizes that although these variables play a key role in these generational differences, the development of a strong party identification is what best explains this deviation, and this is by no means a new political phenomenon. This study will utilize data from the 2020 American National Election Study (ANES) to evaluate how the development of a strong party identification explains the rise in Republican vote share among Latino voters in recent years and explain the role generational status plays.

39. Information Inflation: How Social Media News Consumption Contributes to Societal and Political Fears.

Presenter(s): Owen Cotton

Advisor(s): Dr. Ann Gordon

By permitting each American to be exposed to countless amounts of information through social media, platforms have become even more influential for public perception. Since the establishment of social media platforms the United States has certainly seen an increase in political and social disputes, particularly during the last couple presidencies. In this paper I will examine what is the link between growing concerns of public unrest and social media, and to what extent the next generations of Americans are affected. With a partial focus on feelings resulting from the January 6th riots in 2021, I will examine to what extent social media changes public opinion and civil unrest. Using original data sets like the Chapman University Survey of American Fears I find a strong relationship between Americans' increased fears, consistent social media usage in terms of receiving news. Generally speaking these findings have illuminated that social media can present fears and influence the minds of young Americans specifically. When evaluating the effects of January 6th, and political intensity that followed, I find that those who do not primarily receive information through social media are less likely to hold extreme political

opinions and concerns. As well, their general fear of civil unrest is lower than those who may use social media everyday as a news resource. Therefore it's important to analyze social media influence contributing to increased fears, to perhaps further understand its effect on society and politics. Although social media is a great tool for information and communication, it elevates fear mongering and negativity towards general public perception.

40. Globalism: Should We Fear it or Embrace it?

Presenter(s): Luke Peterman

Advisor(s): Dr. Ann Gordon

The world's economy is becoming more interlinked than ever before. With capitalistic practices being adopted by leading nations around the globe, as well as technological advancements bringing new capabilities to governments each day, economic liberalization seems inevitable. In this paper, I analyze the correlation between American fear of unemployment, as well as fear of not being able to afford rent and how these concerns shape national sentiments regarding globalism. Relying on the Chapman Survey of American Fears, a representative national sample of U.S. adults, I expect to find that the individuals who are most apprehensive towards the globalization of the U.S. economy also have a strong fear of becoming unemployed or not being able to afford rent. Additionally, I expect to find that specifically middle-class/working Americans are hesitant to accept the government's effort to globalize the economy. The relationship between security in one's employment, as well as the effect it will have on their future economic endeavors and the extent that one embraces the globalization of the U.S. economy is one that I expect to be exceptionally strong. Despite the inevitability and obvious advantages of economic liberalization, our nation must consider the effects it will have on all Americans and weigh the costs and benefits of this governmental practice.

Psychology

41. Understanding Conscious Intentions by Investigating Changes of Mind

Presenter(s): Bahar Babagoli, Jake Gavenas, Emma Chen

Advisor(s): Dr. Uri Maoz

The Contingent Negative Variation (CNV) is an EEG signal that emerges during response preparation. However, it is unclear whether the CNV reflects general motor preparation or formation of specific abstract intentions. Throughout this experiment, we investigated the relationship between reaction times and the commitment to abstract intentions.

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