Message from the Director

Greetings and welcome to the Spring 2023 Chapman University Student Scholar Symposium! Student Scholar Symposium which is held once each semester celebrates the remarkable scholarship and creativity conducted by Chapman 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, attend the oral discussions, or visit the art display in Argyros Forum 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 James Portillo, Administrative Assistant, who designed, developed, and organized the event. A special thanks to both of them! Thanks also to Dr. Jason Keller, Vice-Provost for Graduate Education and Lonnise Magallanez, Operations Administrator, for including graduate students among the presenters. 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

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

Shinnyo Fellow – Rabia Asif
Student Scholar Ambassadors

Oral Presentation Moderators:

Dr. Ana Palomar
Dr. Desiree Crevecoeur-MacPhail
Dr. Justin De Leon
Dr. Kelli Fuery
Madeline Warren
Micol Hebron

Schedule of Events

Presentation Schedule

Poster Session I	**11:30 - 1:00 pm**
Poster Session II	**2:00 - 3:30 pm**
Poster Session III	**4:30 - 6:00 pm**
Oral Session I	**11:00 - 12:00 pm**
Oral Session II	**12:30 - 1:30 pm**
Oral Session III	**2:00 - 3:00 pm**
Oral Session IV	**3:30 - 4:30 pm**
Visual Arts Session I	**1:00 - 2:00 pm**
Visual Arts Session II	**2:30 - 3:30 pm**

Table of Contents

Student Scholar Symposium Visual Art Exhibition

Tunnel Vision
Reese Paddock
Digital Collage

How Many in Your Party?
Amanda Stein-Sigal
Digital Collage

Uncanny Evolution
Will Baca
Photoshop

Opportunities
Johannah Choi
Digital Collage

Blissful Unawareness
Anders Little
Photoshop Collage

Runaway
Cameryn Krauss
Digital Collage

I Love My Art and My Art Loves Me
Magdalena Alexander
Digital Collage, Photoshop

Self-Portraiture Through Cultural Narrative, Personal History, and Folklore
Daniel Purtell
Digital Collage

Human Nature
Emily Paris
Digital Collage

Hidden Emotion, Masked Identity
Isabelle Morr
Digital Collage

Inner Nature
Hannah Emerson
Digital Collage

Metamorphasis
Olivia San Jose
Digital, Photoshop

Artificial Self-Image
Sydney Carson
Digital Collage

Daydream
Alex Wolf
Digital Collage, Photoshop

Biochemistry and Molecular Biology

1. **Down-Regulation of Androgen Receptor in Breast Cancer Cell Lines Using Natural Product, Apigenin**
   Presenter(s): Yeseom Cho
   Advisor(s): Dr. Marco Bisoffi

Unlike early breast cancer, triple-negative breast cancer (TNBC) tends to be untreatable because it lacks estrogen receptor, progesterone receptor, and human epidermal growth factor 2, against which medicines exist. Since TNBC accounts for about 10-15 % of breast cancer and is deadly, the experiment to down-regulate the TNBC was studied. According to the previous study, TNBC expresses a high level of androgen receptor (AR), which will be the critical receptor to downregulate the expressions of TNBC eventually. The purpose of the experiment was to target the androgen receptor (AR) in TNBC by specifically using the natural product called apigenin. Three breast cancer cell lines, MCF-10A (non-cancerous epithelial cell line), MCF-7 (breast cancer cell line with estrogen and progesterone receptors), and MDA-M-453 (triple negative breast cancer cells), were cultured to study the effect of apigenin in androgen receptor for TNBC. MCF-10A, MCF-7, and MDA-MD-453 were all put into the control DMSO, and the concentration of 50 µM of apigenin. The phenotypical change of three cell lines was studied to compare the control and treatment groups. In addition, the Bradford assay using bovine serum albumin (BSA) was analyzed to detect the protein concentration. As a result of the Bradford assay, the protein concentration of cell lines treated with apigenin was lower compared to the control group of all three breast cancer cell lines. In addition to the Bradford assay, protein expression of androgen receptors for each MCF-10A, MCF-7, and MDA-MB-453 were measured and analyzed by Sodium dodecyl sulfate polyacrylamide electrophoresis (SDS-PAGE) and Western blotting.

2. **An Exploration of Spatial Visualization Skills: Investigating Students' Use of 3D Models in Science Problems Through Think-Aloud Interviews**
   Presenter(s): Sarah Abdo
   Advisor(s): Dr. Jeremy Hsu

Effective spatial visualization and reasoning skills are often credited for students' success in science and engineering courses. Spatial visualization techniques such as molecular and DNA modeling kits are helpful tools used in biology and chemistry courses to better support students' ability to conceptualize compounds in two and three dimensions. However, students enrolled in these science courses are not always exposed to or trained properly on the best ways to utilize models to aid in their learning. We set out to investigate the techniques that students use to better comprehend science problems. In this exploratory study, 15 undergraduate and graduate students from various natural science and engineering disciplines were interviewed in task-based, think aloud sessions. Participants were asked to conceptualize 2D representations of various biomolecules with the use of 3D models. While solving problems, participants demonstrated their thought processes to give insight into their spatial visualization techniques. The observations of this novel study illustrate the power of effective 3D model use and spatial visualization techniques to increase students' understanding in science courses. Furthermore, by

implementing spatial visualization training to teach students how to effectively use 3D models and drive creative problem-solving techniques in science curricula, STEM classes can be made more enriching and accessible for all students.

3. **Understanding Calmodulin and HIV Matrix Protein Interactions Through Circular Dichroism Spectroscopy**
   Presenter(s): David Nguyen, Andrea Sandoval
   Advisor(s): Dr. Jerry LaRue

HIV-1, or human immunodeficiency virus type-1, is a virus that is important to study because it attacks the immune system can lead to AIDS, which is a life-threatening ailment. HIV-1 matrix proteins (MA) are a crucial component to the replication cycle of HIV-1. Calmodulin (CaM) is an important messenger protein present in all eukaryotic cells and is upregulated in calcium. The purpose of this project is to use Circular Dichroism (CD) spectroscopy to observe and analyze the interactions between Calmodulin and HIV Matrix proteins, which have been found to occur in calcium conditions. In CD spectroscopy, left and right polarized light are shined through the proteins, resulting in a graph that can analyzed using Molar Ellipticity to determine if left or right polarized light was absorbed more. This information can be used to evaluate the structures of the proteins, such as alpha helices and beta sheets, as they bind together which would improve understanding of the binding process.

4. **Mapping Arginine Methylation Within BAG3 Via Mass Spectrometry**
   Presenter(s): Arisbeth Mancilla
   Advisor(s): Dr. Cecilia Lopez

Dilated cardiomyopathy (DCM) or the enlargement of the heart ventricles leads to impaired contractility and is linked to heart failure. B-cell lymphoma 2- associated athanogene (BAG3), is an anti-apoptotic chaperone that helps other proteins fold properly. BAG3 is highly expressed in the heart and mutations in BAG3 are associated with DCM. Through a computational approach, our laboratory has found that BAG3 is able to receive methyl groups at arginine residues. Like phosphorylation, protein arginine methylation regulates proteins. We set out to identify the arginine residues that accept methyl groups in BAG3 for the broader purpose of understanding whether arginine methylation plays a role in the progression of cardiac disease. BAG3 consists of 575 amino acids and contains a lysine-phenylalanine-glutamic acid- arginine-glutamine (KFERQ)-like motif. This motif is recognized by the chaperone mediated autophagy (CMA) pathway, responsible for degrading proteins with this domain. We determined computationally that arginine methylation can occur within the KFERQ-like motif, potentially blocking recognition of BAG3 and preventing its proper degradation. We hypothesize that arginine methylation within the KFERQ-like motif inhibits proper degradation of BAG3. To validate computational results, we have performed methylation reactions with protein arginine methyltransferase 1 (PRMT1). The methylated BAG3 product was then treated with performic acid, digested with trypsin or glu-c and analyzed using Quadrupole Time-of-Flight Mass Spectrometry (QTOF-MS). Preliminary results detect peptide fragments corresponding to BAG3, however, arginine methylation is yet to be determined. Reactions are currently being optimized to ensure that methylation is above the limit of detection for MS instruments. Once arginine methylation within the

KFERQ-like motif is confirmed, we will next determine if methylation interferes with the CMA pathway. Identifying where BAG3 is methylated will allow for a greater understanding of its function and will be useful for preventing cardiac death.

5. **A Spectroscopic Approach to Understand Protein Flexibility Using Red-Edge Excitation Shift**
   Presenter(s): Destiny Ly, Brianna Dinn, Kylie Sacapano, Kellie Omori
   Advisor(s): Dr. Cedric Owens

Local flexibility is important for protein function since flexibility plays a role in molecular recognition and turnover. However, directly determining local flexibility in a protein is challenging. Methods exist to measure protein flexibility, such as NMR spectroscopy and small angle x-ray scattering, but they are technically demanding. An informative and under-utilized approach is red-edge excitation shift (REES) spectroscopy, which is sensitive to the local environment around a fluorophore. REES measures the red shift in the emission intensity maximum that arises when a fluorophore is excited near its low-energy excitation limit. The degree of red-shift correlates to the amount of conformational states the fluorophore can sample, with residues located in highly flexible regions having the smallest degree of REES. In the present study, we are using REES effect experiments to analyze fluctuations in chlorogenic acid (CGA) esterase, an enzyme that may be useful in the food and biomass industry for CGA removal. Single tryptophan (Trp) mutants were generated, with each Trp residue serving as a reporter for its surroundings. Results show that the degree of REES correlates well with solvation, as buried Trp residues display a larger effect than residues located in mobile regions of the protein. The REES signatures of a Trp residue placed near the CGA esterase active site indicate that this region possesses conformational flexibility, but less than would be expected based on B-factor analysis, suggesting that the active site may be more rigid than previously thought. Overall, this study demonstrates that REES is a promising method for measuring local protein flexibility.

6. **Measuring the Flexibility of a Chlorogenic Acid Esterase from Lactobacillus Helveticus Using B-Factor Analysis and Red-Edge Excitation Shift (REES) Spectroscopy**
   Presenter(s): Kylie Sacapano, Kellie Omori, Destiny Ly, Brianna Dinn
   Advisor(s): Dr. Cedric Owens

With food allergies becoming increasingly common, the food industry is interested in producing hypoallergenic foods. Sunflower seed flour is a great alternative flour that is soy-free, nut-free, and gluten-free. However, the high chlorogenic acid (CGA) content of sunflower flour prevents its widespread use since CGA can induce green discoloration by reacting with free amino groups under alkaline conditions. The greening effect can be inhibited by using a CGA esterase. CGA esterase prevents the formation of the green pigment by hydrolyzing CGA into quinic and caffeic acid. The long-term aims of this project are to investigate how CGA esterase flexibility relates to its activity. The immediate goal of this work is to determine flexible regions of the protein using two complementary techniques, B-factor analysis, and red-edge excitation shift (REES) spectroscopy. The B-factor, also referred to as the Debye-Waller factor, is obtained from a protein's crystal structure, with large B-factors corresponding to regions of high flexibility. Our B-factor analysis revealed that CGA esterase contained flexible regions at the surface, near the active

site, and in linkers connecting subdomains. REES is a fluorescence-based technique that utilizes the inherent fluorescence of tryptophan to provide information about local flexibility. REES was used to validate our B-factor analysis results. To do so, REES experiments were performed on single Trp mutants, which were created by introducing Trp into structural regions of interest, particularly flexible ones, and regions near the active site. Results suggest that REES measurements largely align with B-factor analysis but are able to provide more informative data regarding the relative fluctuation between regions. In particular, REES data suggests that the active site is less flexible than was initially predicted based on the B-factors.

Biological Sciences

7. **Exposure to Chronic Stress Elicits Sex-Dependent Effects on Gene Expression in the Hippocampus of Japanese Quail**
   Presenter(s): Delilah Schuerman
   Advisor(s): Dr. Patricia Lopes

Any significant disturbance to homeostasis is considered a stressor. An acute stressor, lasting a short period of time, can lead to physiological responses that are sometimes harmful but generally beneficial to the organism. However, when organisms are exposed to stressors for a prolonged or continuous period, the body can enter a state of chronic stress and the bodily reactions produced become detrimental. During the general stress response, one of the biological reactions consists of increased production of glucocorticoids. The hippocampus, a structure in the temporal lobe of the brain, is involved in learning and spatial and contextual memory. It is also densely concentrated with glucocorticoid receptors and is highly susceptible to stress. In this study, female and male Japanese quail (Coturnix japonica) were chronically exposed to the main avian glucocorticoid (corticosterone), to examine the effects of chronic exposure to this hormone on transcriptomic responses in the hippocampus and whether these effects differ by sex. Hippocampal RNA was extracted and sequenced, and transcriptomes were analyzed using a bioinformatics pipeline. There were 113 differentially expressed genes identified in females and 64 differentially expressed genes in males, with only 5 genes overlapping between the sexes. The identification of very few differentially expressed overlapping genes indicates that chronic exposure to corticosterone leads to a divergence in genetic responses between females and males. The profiling of nearly two times as many differentially expressed genes in females shows that there may be a gender gap in hippocampal responses. Upregulated and downregulated differentially expressed genes in females also suggest a restructuring of the hippocampus and a disruption of memory formation ability.

8. **A Morphological Look at the Many Faces of Man's Best Friend**
   Presenter(s): Alexander Orlove, Alexa Ortega
   Advisor(s): Dr. Lindsay Waldrop, Dr. Nicholas Hebdon

Since domestication, breeding efforts by humans have expanded the variation in dog morphology to better serve in certain roles. While these breeds are visually distinct, it is unclear if differences in morphology

correlate with performance differences. Historically, the evaluation of whether breeds were successfully emphasizing a particular trait is largely qualitative. These efforts are largely taken at face value with minimal quantitative effort having been invested into learning if breeding has had an impact on performance. However, to best approach this problem we first need to establish a foundational understanding of the ways the breeds differ from each other. One of the most obvious regions of difference is the skull because it has both aesthetic and performance value from a human perspective. We use both geometric and traditional morphometrics to establish a suite of shape parameters relevant to canid skulls and their performance. We use the resulting morphospace to explore the clustering in a small sample group of task-oriented breeds to examine intragroup and intergroup similarity. We find that intergroup similarity is much tighter than was expected with the only major separation occurring between "companion" type breeds and "working" breeds. Additionally, sighthounds were subtly distinct from other "working" breeds.

9. **Physical Properties for Target Odors Affect Behavior Changes During Learning in Detection Dogs**
   Presenter(s): Alexis Shiber, Clay Cranston, Alexa Ortega
   Advisor(s): Dr. Lindsay Waldrop, Dr. Nicholas Hebdon, Daniel Mejia

Detection dogs are frequently used to find hidden explosives, drugs, and contraband. Not much is known about how dogs learn to track odors to a source in a complex fluid environment. Factors like the physical properties of the target odor can affect how odor plumes develop and move, and therefore how dogs will behave when learning to find an odor source. In this study, we observe the process of dogs learning how to track a novel target odor and how the physical properties of that target odor affect the learning process. We recruited 14 domestic dogs of various breeds to participate in the trial; these dogs were previously trained in sport scent work on different target odors. Two target odors were used for training: 2-ethyl 1-hexanol (2E1H), a component of plastic explosives which has a low diffusion coefficient and vapor pressure, and ammonium, a common improvised explosive with a high diffusion coefficient and vapor pressure. Each dog and handler team was tested on a wall containing four open holes with one of the two target odors, a blank with no odor, and two distracting odors. Teams were tested initially without training on the target odors and then after five to six weeks of training on each target odor. Two video cameras recorded movements and audio of the dogs from above and the side. Trials were scored by two trained observers during the trial and two trained observers through the videos for a variety of search and alert behaviors. Kinematics of the dogs' heads were tracked using DLTdv8. We found that the kinematic responses between trials 1 and 2 were different in the proportion of time spent close to the target odor source, and most dogs displayed alert behaviors on the trained target odor sources on trial 2. However, alert success was higher for ammonium than 2E1H in trial 2. Alert behaviors and kinematics in trials 1 and 2 suggest differences in how the dogs are learning to source each target odor. Future studies will help to guide the training of explosive detection dog and handler teams to better detect bombs of different chemical compositions.

10. **Holistic Bioactive(s) Provide Potential Alternatives to Conventional Pharmaceutical Antidepressants**
    Presenter(s): Sharon Nguyen
    Advisor(s): Dr. Susan Yang

According to the World Health Organization, depression is a leading cause of disability worldwide and is a major contributor to disease 3. Despite the prescription of antidepressants and other conventional drugs, these treatment plans have a high tendency to cause major side effects in the long term 2. Reported by the National Institute of Health, antidepressant users of >3 years have dealt with excessive weight gain, addiction, suicidality, and withdrawal symptoms. With these alarming insights in mind, there needs to be a push for research into alternative and/or holistic medicine, in hopes of natural properties reducing residual effects and tolerance build-up. This study aims to answer whether holistic medicine therapy can be an effective alternative to treating neuropsychiatric disorders like depression. In this study, we chose to focus on bioactives, BR – Bupleurum Radix and FPP – fermented Porcine Placenta, since they are ubiquitous among modern-day holistic medicine. In order to measure depressive behaviors, test subjects (rats) were introduced to two common stress models, FST – forced swimming tests and TST – tail suspension tests, that highlighted their 'desire to live' over a short period of time. Administration of BR (200mg/kg) and BR (400mg/kg) illustrated statistical significance in antidepressant effects. On the other hand, FPP highlighted a decreasing trend of depressive symptoms, but no statistical significance. Ultimately, expanding research on holistic medicine will pave a way for personalized medical treatment and encourage a more sustainable way of living.

Chemistry

11. **Effect of Anions on the Adsorptive Properties of Iron Oxyhydroxide Nanoparticles**
    Presenter(s): Sebastian Vera
    Advisor(s): Dr. Christopher Kim

California's history of mining has created hazards that can affect human health as well as ecological systems. For example, mine waste may contain heavy metal components which are known to be carcinogenic. As a result, new methods must be developed to remediate the environment surrounding these mines to prevent human exposure. Iron oxyhydroxide nanoparticles and their aggregates are a potential solution to this problem as they are known to serve as effective sorbents of metals. The goal of this project is to build upon previous work done by within our lab that studied how changes in geochemical conditions, such as salinity, can affect the sorptive properties of the iron oxyhydroxide nanoparticles. Previous work primarily consisted of adding artificial seawater to the aggregated nanoparticles to study the effect of the changing salinity. The current experiment is concerned with the effect of ions found in sea water on the adsorption and desorption between iron oxyhydroxide nanoparticles and heavy metal ions. In this case, dilutions of sulfate, chloride, and a mixture of both were tested. Based on previous experiments, it is suspected that the presence of these anions influences the sorbing interface between the metals present in the solution and the iron nanoparticles by possibly interfering the ternary surface complexes that are formed.

12. **Methanol Decomposition and Oxidation on Platinum Surfaces: Characterization of Catalytic Processes Through Ultra High Vacuum Applications and X-Ray Spectroscopy**
    Presenter(s): Kevin Alvarado Jimenez
    Advisor(s): Dr. Jerry LaRue

Methanol decomposition on platinum has been of great interest to chemists in the chemical industry because of its importance as a chemical intermediate. The decomposition of platinum and oxygen-covered platinum follow different reaction pathways depending on the platinum surface structure. On most surfaces, the step sites are more effective at breaking stable bonds, whereas, on a platinum surface, studies have shown that the step terrace sites break C-O bonds, and step sites break the C-H more effectively. However, these interactions' exact mechanisms and paths are not precisely understood. Therefore, to gain insights into the reaction pathways, X-ray Spectroscopy (XPS) can be used to study the decomposition of methanol on different platinum surfaces: flat Pt(111), highly stepped Pt(531), and a mix of flat and highly stepped Pt(221). To better understand the processes, ultra-high vacuum (UHV) chambers can be used to isolate the target reactants from other possible contaminants. UHV surface science chambers create atomically clean environments by lowering the pressure in the system to approximately 10-10 torr, removing all potential contaminants to isolate the chemical reaction truly. As such, studying methanol decomposition on platinum in an UHV surface science chamber will provide new insights into our understanding of chemical reactions and possibly improve catalyst design.

13. **Methanol Decomposition on Platinum Under UHV Conditions**
    Presenter(s): Quy Loi
    Advisor(s): Dr. Jerry LaRue

Catalysts are crucial in society, especially in industries where they serve as the backbone of many manufacturing processes by reducing energy consumption, increasing production rate, and minimizing pollution. In an effort to discover more efficient and useful catalysts, we must first understand the properties and mechanisms that control chemical reactions on catalytic surfaces. Thus, the project explores the molecular interactions during a chemical reaction by studying the decomposition of methanol on platinum under UHV conditions. This research serves to aid future research in providing support to help the catalysis development that meets the growing demands of society. Under UHV conditions, the chemical interactions can be further studied and explored as the reactions are isolated without outside factors and potential contaminants. The UHV surface science chamber consists of standard surface science instruments, such as an ion gun and a mass spectrometer, combined with LEED, AES, and TPD to observe and study chemical processes that govern the catalytic reactions. The decomposition of methanol on platinum is studied using temperature-programmed desorption (TPD) and temperature-dependent sum frequency generation (TD-SFG) spectroscopy. The TDP measures the gas products as a function of sample temperature using a mass spectrometer, allowing for the determination of reaction energies and gas product distributions. The TD-SFG measures the changes in the intensity of a sum frequency signal generated when two beams of different frequencies interact with a sample at an interface, which gives the vibrational spectra of methanol on the platinum surface. By utilizing a combination of these

techniques, a detailed depiction of the chemical process that happens on the surface of platinum with respect to temperature variations can be obtained. Hence, we can compare the competing pathways of methanol on platinum and understand how the surface structure of platinum will impact the distribution of the gas products.

14. **Using Carbodiphosphorane Catalysts to Facilitate the Hydroboration of Isocyanates**
    Presenter(s): Ben Janda
    Advisor(s): Dr. Allegra Liberman-Martin

Hydroboration is a common organic reduction reaction that can be used to synthesize various compounds in the pharmaceutical and polymer industries, as the boron-containing products can undergo useful subsequent transformations. Hydroboration reactions are typically catalyzed by expensive transition metal catalysts, which are neither cost-effective nor energy efficient due to the power and labor involved in mining these metals. As a less expensive alternative, the Liberman-Martin Group is currently investigating the use of carbodiphosphoranes as catalysts. These organocatalysts can be synthesized via a two-step synthetic process and are strong nucleophiles due to the electron-rich carbon(0) atom at their center. This poster will discuss the hydroboration of various isocyanates using carbodiphosphorane catalysts and compare the catalytic activities of carbodiphosphoranes to other common organocatalysts.

15. **The Theoretical Efficacy of a Calcium, Bis(trifluoromethanesulfonyl)imide, and Hexafluorophosphate Salt on Sulfur(VI)-Fluoride Exchange**
    Presenter(s): Kurt Horney
    Advisor(s): Dr. Maduka Ogba

In recent decades, there has been significant research interests in using Lewis acidic salts from earth abundant and inexpensive metals as catalysts in chemical reactions. There are still multiple gaps in knowledge with regard to how to design the optimal salt for a given chemical transformation. This research focuses on studying the effect of altering the counter-ions of a Lewis acidic calcium triflimide [Ca(NTf2)2] salt on its ability to facilitate sulfur(VI) fluoride exchange. Notably, previous literature suggests that replacing on NTf2 anion with hexafluorophosphate (PF6–) anion should increase the Lewis acidity of the calcium salt. However, in the sulfur(VI) fluoride exchange study, incorporation of PF6– effectively shuts down the reaction. Previous research has determined that the PF6– ion enhances Lewis acidity of the calcium catalyst. In our efforts to understand this discrepancy in the role of the counter-ion, we employ computational techniques to determine the likely mechanism and activation barriers for sulfur(VI) fluoride exchange mediated by Ca(NTf2)(PF6) and compare our findings with previously reported work from our lab on the Ca(NTf2)2 mediated process. In this poster, the proposed study, hypothesis for the observed counter-ion effects, and preliminary computations will be presented.

16. **Metal Ion-Counterion Effects on Lewis acid-mediated sulfur-fluoride exchange**
    Presenter(s): Leah Zahn
    Advisor(s): Dr. Maduka Ogba

Lewis acidic salts of earth-abundant metals have recently gained attention as economically and environmentally advantageous alternatives to transition metal catalysts in chemical reactions. However, little is known about how altering the metal ion or the counterion of the Lewis acidic salt affects the nature of the salt-substrate binding and interaction modes during the activation process. To investigate this effect, we use a recent report on metal-mediated sulfur (VI) fluoride exchange (SuFEx) as a case study. In the report, calcium salts with bistriflimide counterions outperformed those with triflate and fluoride, and calcium outperformed magnesium, lithium, sodium, and potassium, revealing a clear ion-pair effect on SuFEx reactivity. In this work, density functional theory methods were used to uncover differences in the structural, energetic, and electronic properties of the SuFEx ground and transition states mediated by the calcium salts. The data gathered from our study provided key insights into the origins of the counterion effects and resulted in a new hypothesis for understanding reactivity differences across the Lewis acidic salts.

Computer Science

17. **Global Filter for Semantic Saliency for Visual Attention (Study C)**
    Presenter(s): Drew Bozarth, Daniel Dinh, Kai Itokazu, Cyrus Fa'amafoe'
    Advisor(s): Dr. LouAnne Boyd

Though assistive technologies for Autism have become robust, especially for high-level social communication, there remains a vast gap for technologies targeting less obvious cognitive and sensory impairments, one being the inefficient integration of various sensory channels due to local interference. In contrast to global information, which provides key contextual information for the overall comprehension of sensory input, local interference is the over-prioritization of minute information, obstructing the complete processing of sensory comprehension of the overall environment. This research targets the obstacle of local interference by creating a “global filter” software that highlights pertinent, contextual details in images and videos, assisting with easier identification and comprehension of key information. Therefore, this research evaluates the global filter’s effectiveness in aiding global processing for individuals with Autism. Foregrounding the experimental methodology, neurodiverse and neurotypical participants’ eye gaze were measured by their fixation, location, and duration while being presented with categorically different images in intervals of three seconds. These images were categorized equally into two variables: filtered versus baseline, and semantic (images containing humans) versus nonsemantic. Images were presented in a predetermined yet randomized order. The duration of every fixation falling within intended areas of filtration – called hotspots – were then added for each respective image category and participant. Navon tests were also utilized to metrically categorize participants’ degrees of local or global visual processing by calculating response time over accuracy. Results on the average number of hotspot fixations while applying the global filter show incremental improvements for neurodivergent participants viewing semantic images as well as for neurotypical participants viewing non-semantic images, thus,

demonstrating the promising potential for the global filter's applicability as an accessibility feature to enhance global processing.

18. **Analysis of Speech-to-Text Algorithms in Recognizing Down Syndrome Conversations**
    Presenter(s): Kayla Anderson, Cecilia Abrahamsson, Yuki Chen
    Advisor(s): Dr. Franceli Cibrian

Introduction: Speech-to-text technology has become key in supporting technologies such as voice assistants (e.g., Alexa, Siri). Unfortunately, some individuals with speech differences, such as accents, female voices, children, or individuals with disabilities such as Down Syndrome, are not well recognized, creating issues in inclusivity. The first step toward making it more inclusive is to figure out where the errors or weaknesses are in speech-to-text algorithms (YouTube, IBM, Zoom, and Azure) in recognizing dialogs from diverse populations.
Methods: We analyze 10 videos from the 'Special Books by Special Kids' YouTube channel. Videos include 15 people with Down Syndrome and 6 Neurotypicals. To compare how algorithms perform, we developed a python script to compute the word error rate, mismatch, insertion, and deletion.
Results: Each algorithm did better for Neurotypicals than individuals with Down Syndrome by almost 40%. Overall, the most accurate algorithm was Azure for both Down Syndrome (46%) and Neurotypicals (87%). In general, all algorithms struggled the most with mismatching words, then deleting words, and the least common mistake was inserting words.
Conclusion: Even though Azure is doing better than other algorithms, it still does not work well for Down Syndrome. To further understand the limitations and potential improvement of these algorithms, we propose a phonetic analysis to identify key sounds that prove difficult to detect in each algorithm. The end goal is to determine the best algorithm for analyzing speech from individuals with Down Syndrome and to ultimately provide an inclusive and more accurate algorithm. We are also planning to use estate of the art AI algorithms such as OpenAI and AssemblyAI.
Acknowledgments: The first three authors equally contributed to this paper. We also thank Dr. Vivian Genaro Motti for her contributions to this research.

19. **Region-Specified Machine Leaning for Scattering and Absorption Engineering**
    Presenter(s): Alex Vallone
    Advisor(s): Dr. Nasim Mohammadi Estakhri

Machine learning is a promising platform that is used for both forward modeling and also the inverse design of photonic structures. Unlike other design/optimization algorithms, machine learning is a data-driven approach, and can be very useful when dealing with complex problems without an analytical solution. In this work, we use machine learning for the inverse design of a photonic structure, namely multilayered nanoparticles. Given the complexity of typical electromagnetic problems, recently there has been a lot of interest to conform machine learning models to different electromagnetic problems to allow for speedy design and/or analysis. Here, and based on a region-specified design approach (Estrada-Real et al. Photonics and Nanostructures-Fundamentals and Applications, 52, p.101066, 2022) we design multilayered nanoparticles that can provide our desired amount of scattering and absorption. We use a small training dataset (useful for complex problems), and then enhance the dataset using random region

specification. The random region specification involves generating a pool of regions of interest (ROIs), which are added as additional channels to the data, and then multiplied by their corresponding data channel. ROIs are equal-sized arrays of zeros and ones, indicating whether a corresponding wavelength is inside or outside the region. The incorporation of ROIs not only allows us to specify the regions of interest but also effectively increases the dataset size by 25 times. Using an inverse convolutional neural network (CNN) we report several successful designs, along with discussion on the importance of the training dataset size on the performance of the model.

Data Analytics

20. **Formula 101: Using 2022 Formula One Season Data to Understand the Race Results**
    Presenter(s): Christopher Garcia
    Advisor(s): Dr. Oliver Lopez

The reason why I am interested in Formula One is that my friend showed me what Formula one was all about. It became interesting to see the action of the sport, including the battles that the drivers have during the race, how fast they go through a corner, and when qualifying comes around, they push their car to the absolute limit to gain a few seconds off their opponents. The drivers only in the top 10 receive points from the winner getting 25 points, the last driver in the top 10 getting 1 point, and those below the top ten end up with no points. The competitiveness that Formula One creates is impressive from all the drivers competing to be the best. I collected my data through the Formula one 2022 race result website, which shows the race winners' race data and the whole grid of drivers where they all placed in the race. It also includes the racers that were unable to finish the race due to problems with the car, and also, they could crash, which results in a DNF. The main reason we will use the data is to figure out the averages of each driver where they usually place on the grid. Also, we can figure out the averages of points they get for the season. What I want to do with the data is to figure out the pattern of each driver when they get points throughout the season. Also, the data can show us who is the better driver of the season. The data can show us what teams keep on placing high on the grid, and we can also figure out the teams that show more progress towards the end of the season.

Economics

21. **The Representativeness of United States College Syllabi Data**
    Presenter(s): Anjali Lauwers
    Advisor(s): Dr. Sarah Bana

Professor Bana and her research team are working to measure the skills taught in syllabi throughout the United States, using data from the Open Syllabus Project (OSP). The OSP data contains syllabi from a subset of institutions, and how representative it is determines the external validity of their results. In my project, I will be collecting data from the IPEDS data set and College Scorecard database and combining them into comprehensive tables using the Pandas dataframes library in Jupyter notebooks to highlight key differences in enrollment between institutions for which we have syllabi and institutions for which we do

not have syllabi. This will help us understand how representative the sample is. One table focuses primarily on differences in enrollment totals and enrollment by gender for each of the provided years. Most notably, I find that we have far more syllabi, and thus far more information regarding skills and curriculum, for larger institutions than we do for smaller ones, which may in turn impact how representative our sample is. Furthermore, I find that there is an upward trend in the number of syllabi we have available for each year. My project also examines differences in enrollment statistics based on certain institutional characteristics. This includes region, setting, and Carnegie classifications. Moreover, I compare enrollment statistics for institutions depending upon whether or not they are classified as land grant institutions, whether or not they are Historic Black Colleges and Universities, whether they are publicly or privately funded, and whether they are two-year or four-year institutions.

Electrical Engineering

22. **Near-Field Control with Metasurfaces**
    Presenter(s): Michael Cheng
    Advisor(s): Dr. Nasim Mohammadi Estakhri

This research attempts to mold the near field distribution on a surface by using a metasurface with 100% transmission efficiency. It has been shown theoretically that it is possible to design metasurfaces with arbitrary near-fields (N. Estakhri et al., 2017 IEEE APS & USNC/URSI, pp. 1723-1724). Based on this article, the theoretical values of surface admittance needed to create a specific near field distribution can be calculated. My research is to figure out how to construct a metasurface with these values. For this purpose, we use the electromagnetic modeling software COMSOL Multiphysics. After constructing a model in COMSOL, we use genetic algorithm optimization in MATLAB to generate a series of surfaces that match the desired calculated admittances. The designed metasurface consists of a plate of FR4 covered in specific areas by a thin sheet of copper, which is consistent with PCB printing technology Some possible applications of these surfaces include sensing and particle trapping due to the possibility of high concentrations of power at the near field.

Environmental Science and Policy

23. **Analyzing Future Projections of the California Region's Drought and Surplus Periods**
    Presenter(s): Citlalli Madrigal
    Advisor(s): Dr. Thomas Piechota

Utilizing historical and projected data collected from rivers streamflow in the California Region to analyze the effects under 8 different climate scenarios. With data from the U.S. Geologic Survey and Coupled Modeled Intercomparison Projection to account for the years 1951 to 2099 for the model. The scenarios utilized were the Representative Concentration Pathway (RCP) 4.5 and 8.5 emission scenarios 8 particular climate models, HadGEM2-ES, CNRM-CM5, CanESM2, MI-ROC5, were taken for the analysis on the California Region. The historical data period, from 1951-2020, is compared to the projected data for each streamflow station for each climate model to achieve the results of the periods of droughts and surplus,

the quantities, and magnitudes in the streamflows. There was a variation in results depending on the climate model and streamflow station. A notable trend for both scenarios RCP 4.5 and 8.5 is how intense the droughts and surpluses were predicted as well as an increase in their duration. The difference between the models is that the CanESM2 and CNRM-CM5 models project wetter scenarios while the HadGEM2 and MI-ROC5 models project dryer scenarios. Applying these scenarios to a prominent station, the Sacramento River at Delta, it is expressed that it will experience more extreme magnitudes and duration than it had historically, which is implied in the other stations as well.

24. **Changes in Western Colorado's Snowpack and Snowmelt Seasons**
    Presenter(s): Kate Hartshorn
    Advisor(s): Dr. Thomas Piechota

Snowpack and snowmelt are essential parts of western Colorado's water cycle and dictate the health of the Colorado River Basin. Using historic daily snow water equivalent (SWE) data and historic daily air temperature data from SNOTEL, we analyze the snow season length and snowmelt period across 14 snow stations in western Colorado from 1981 until the present day. These stations exist at elevations ranging from 8,400 feet to 11,400 feet, revealing different impacts of climate change in relatively lower and higher regions. Significant changes in the length of the snow season and the pace of snowmelt in this area are indicators of the negative impacts of increasing global temperatures. The historical data in this study will be applied to climate prediction models to predict future snow seasons and snowmelt periods in western Colorado. The results of this study will add to a growing understanding that seasonal snowpacks are decreasing globally as a result of anthropogenic climate change. Climate change's impact on snowpack will affect the water availability and water management of the Colorado River Basin and ultimately alter the natural landscape of western Colorado.

25. **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.

Film

26. Authenticity of Pornography in Media
Presenter(s): Alison Kreul
Advisor(s): Dr. Ian Barnard

Within the cinematic medium and mainstream, pornography has been repeatedly depicted, viewed, and ridiculed in a negative light. Despite that, plenty of filmmakers have taken on clichés and stereotypes in an attempt to rewrite and adjust the public's perception. In director Paul Thomas Anderson's 1997 film Boogie Nights, the story is a loose retelling of porn star John Holmes' rise and fall from pornographic grace. Instead of solely focusing on the fictionalized version of him, Eddie Adams/Dirk Diggler (Mark Wahlberg), though, the film follows a large ensemble that details not only the unceasing, vibrant energy of the industry at the time but also includes the lengths cast and crew members went to crafting the highest quality porn films possible. Twenty-four years after the release of Boogie Nights, Ninja Thyberg, in her directorial debut, premiered Pleasure (2021), a film that revolves around Bella Cherry's (Sofia Kappel) trials and tribulations as an aspiring actor in the porn industry. While the film has been praised for its authenticity, it has been criticized by several industry members for its negative and unfair depiction, in addition to the director's history of anti-porn beliefs. This presentation will be a comparative analysis of the two films, focusing on their stark contrasts. Through a comparative analysis, I will argue that Boogie Nights utilizes a more realistic approach than Pleasure in its storytelling, which struggles to give the hardworking artists within its industry the positive recognition they seek and deserve.

27. Rhetorical Interactions with Language in Pornography
Presenter(s): Sophia Bain
Advisor(s): Dr. Ian Barnard

This presentation will examine the rhetorical polysemy surrounding "pornographic" language, that is, language used in and around visual pornography. By first looking at the meaning of the word "pornographic" itself, by way of the various functions and implications of the word, I will then analyze the rhetorical interactions in and representations of language in visual porn. In addition to "pornographic," examples of words and constructions to be analyzed include: the psychoanalytic and moral implications of "good girl"; the phallocentric gendered power dynamics of "penetrated/penetration"; and various expressions used to refer to genitalia during sexual intercourse. With a specific focus on feminist and queer theories, I will analyze the ways in which the proliferation of cis-heteronormative and patriarchal sexual terminologies and constructions produce and enforce power relations. This semiotic and epistemic analysis does not aim to make a value judgement on the morality or validity of the study of pornographic images/language; rather, it simply aims to analyze the impacts of the work given the already-established social relevancy. Building on existing porn studies scholarship and rhetorical, semiotic theories, this presentation aims to examine the import of and role of language on the patriarchal heteronormative gender relations.

Food Science

28. Labeling Compliance, Species Authentication, and Short-Weighting of Frozen Shrimp Sold at Grocery Stores in Southern California
Presenter(s): Alexia Campbell
Advisor(s): Dr. Rosalee Hellberg

Seafood is susceptible to various types of fraud, including species substitution, mislabeling county of origin and production method, and short-weighting, typically for economic gain. Although shrimp is the most consumed seafood product in the United States, few published studies quantify the extent of short-weighting and mislabeling of frozen shrimp in the marketplace. This project investigates Country of Origin Labeling (COOL) compliance, species authentication, acceptable market names, net weights, and percent glaze among frozen shrimp. A total of 106 frozen shrimp products were purchased from grocery stores in Southern California. Samples were determined to be COOL-compliant if both the country of origin and procurement method (wild or farm-raised) were reported at the point of sale. Net weights and percent glaze were determined by weighing each sample before and after deglazing according to AOAC methods. Species authentication and acceptable market names were determined by comparing the species identified by DNA barcoding to the acceptable market names in the FDA Seafood List. Of the 106 samples, 101 (95%) complied with COOL regulations. The average percent glaze was 16.6%, with 28 samples (26%) having >20% glaze. Short-weighting was detected in 38 samples (36%), with the highest prevalence in the super/extra colossal shrimp category (57.1%). Of the 100 samples that were able to be sequenced, species mislabeling was identified in 26 samples (26%), including instances of species substitution, conflicting market names, and unacceptable market names. The results of this study indicate high COOL compliance but suggest a need for increased inspection and regulatory oversight for species mislabeling, short-weighting, and overglazing of frozen shrimp sold in the United States.

29. Optimization of DNA-Based Methods for the Detection of Canned Tuna Species
Presenter(s): Aubrey Emmi, Biola Fatusin
Advisor(s): Dr. Rosalee Hellberg

Tuna is susceptible to species mislabeling due to its high demand, quick rate of production, and wide range of price points. DNA barcoding, a sequencing-based technique, allows for the detection of species mislabeling by targeting a standardized region of DNA. A mitochondrial control region (CR) DNA barcode has been found to be capable of species discrimination for tuna, but it is challenging to recover from canned tuna. While a short fragment of CR, referred to as a 'mini-barcode', has shown some success with canned tuna species identification, more research is needed to improve identification rates. The objective of this study was to determine the optimal DNA extraction method for species identification of canned tuna using CR mini-barcoding. Four commercial DNA extraction kits were compared using a sample set of 24 different cans of tuna labeled as albacore, light tuna, skipjack, or yellowfin. All samples were tested in duplicate. The greatest success was found with the Qiagen DNeasy Blood and Tissue Kit and the Qiagen DNeasy mericon Food Kit, which resulted in species identification for 42% of samples. In comparison, the MP-Biomedicals Fastprep-24 + Machery-Nagel Nucleospin Tissue Kit resulted in species identification for 30% of samples and the Qiagen DNeasy Blood and Tissue Kit + PowerClean Pro Cleanup Kit resulted in

species identification for 21% of samples. Overall, the top-performing DNA extraction methods for use with CR mini-barcoding of canned tuna products were determined to be the DNeasy Blood and Tissue Kit and the DNeasy mericon Food Kit.

Health Sciences and Kinesiology

30. Changes in Double Support Time and Step Width After Repeated Perturbations
Presenter(s): Michelle Tran, Jacob Hepp
Advisor(s): Dr. Rahul Soangra, Michael Shiraishi

The general risk of falling increases as adults age and contribute to major injuries. There are few recent studies that focus on the methods to reduce the risk of falling and how to better adapt to the risk of falling as one ages. One promising approach to fall adaptation is perturbation training, in which patients are subjected to controlled slips during walking in order to allow them to adapt to the perturbation. Studies have shown that repeated perturbation training results in lower annual fall risk in community-dwelling older adults (Pai et. al, 2014; Laurie et. al, 2020), but do not address the specific changes in the gait cycle parameters that are occurring. Understanding the way gait changes post perturbation can illuminate potential goals in proper perturbation training. The purpose of this experiment is to observe how quickly these adaptations occur and what changes are happening to the gait parameters before and after each slip as well as how they change over all five slips. The methods used for this experiment involved a 650-second walking trial on the Gait Real-time Analysis Interactive Laboratory (GRAIL) dual-tread treadmill with five slips occurring at two minute intervals. Data was recorded using a motion-capture camera system, accelerometers built into the kinematics analysis suit Teslasuit, and force plates embedded beneath each tread of the GRAIL treadmill. Gait parameters relating to double support times and step widths were extracted from the data in the three gait cycles before the slip and three gait cycles after the slip. Averages and standard deviations for data before and after the slip were calculated and significance was determined. The expected results from this experiment are a wider step width and a longer double support period.

Honors

31. A Feminist Analysis of Café Flesh
Presenter(s): Leilani Zbin, Sophie Hickel, Vanessa Cox
Advisor(s): Dr. Ian Barnard

Café Flesh is an award-winning 1982 post-apocalyptic cult pornographic film filled with unshakable avant-garde theater and hypnotizing sex scenes. By manipulating the innate desire for sexual pleasure, the viewer is forced to identify with the on-screen surrogate audience, inflicting a sense of disturbing critical self-awareness. The reflection of the roles in pornography onto the roles in society as well as the tension between those who are free to express their sexuality and those who are forced to do so, provokes a narration on second-wave feminism. Café Flesh distorts stereotypical pornography narratives to negotiate a new interpretation of the realm of pornography. For this reason, this analysis of Café Flesh contrasts the

consumption of pornographic materials and non-pornographic materials. Through sourcing current research, the influence of pornography on behaviors toward sex and intimacy is dissected, as well as how this conformation of pornography is digested by the public eye. Critics and experts on pornography are cited, including Nina Hartley and Women Against Pornography (WAP). Their arguments are utilized to determine the critical takeaways of this film in feminist discussions. Café Flesh's commentary on second-wave feminism emphasizes the idea that sex can and should be central to women's liberation. Pornography is a revolution, a feminist revolution that is supported by Café Flesh's horrific depiction of male dominance and what it can do to a person.

32. **Reforming Sex Education by Using Feminist Pornography**
    Presenter(s): Mariana Juarez
    Advisor(s): Dr. Ian Barnard

Sex education was first introduced into high schools in the 1920s. While it was mandatory to teach sex education, there were no instructions on what topics schools should focus on. Today, most adults don't know basic sex education because of the intolerance of the education system in some states, which thus affects their sex life. While some states have good teaching of sex education, very few focus on pleasure; if they do, they focus it on males. There are opportunities for everyone to learn better sex education. Sex education doesn't just stop at middle/high school, you can learn as you go. Reforming sex education might be difficult as we are so engulfed in this idea of male pleasure that we don't think of looking at it from a different lens. Feminist porn, for example, could be used as a tool in sex education and could be learned from, if used right, as there is a difference between regular porn and feminist porn. When used correctly, pornography could be used as a significant tool to learn about sex and to dismantle the stereotypes and techniques that harm sex life. By using feminist pornography to reform sex education, people are learning how to differentiate what is "real porn" and what is "fake." Using feminist pornographers like Nina Hartley, Tristin Taormino, Lorelei Lee, and April Flores, we will tackle how feminist pornography could reform sex education while explaining the stereotypes and negative aspects of porn.

33. **An Analysis of the Business of the Porn Industry: Opportunities and Challenges in a Changing Landscape**
    Presenter(s): Richard Rodriguez
    Advisor(s): Dr. Ian Barnard

According to Fight The New Drug, the porn industry is a multi-billion dollar business that has expanded rapidly due to the rise of the internet. This industry generates revenue through the production, distribution, and consumption of adult entertainment content, such as videos, magazines, and live webcam shows. The industry is comprised of a variety of players, including performers, producers, distributors, and website operators, among others. The industry has faced criticism and controversy regarding issues such as exploitation, objectification, and potential harm to performers. Despite the fact that this industry undergoes issues that other businesses face, it still is not treated as one. Financial statements are not made official, content is being stolen, and sites like MindGeek have taken a monopoly on the industry as a whole. This paper seeks to dive into the ethical and financial issues that the porn industry endures while also exploring what recent technological advancements can dramatically change

the industry as a whole. My research will draw comparisons between companies in this industry and everyday conglomerates. Data surrounding profit losses due to stolen media, the benefits of cryptocurrency, and the staggering amount of revenue generated through advertising will be discussed. This paper expects to find that despite the fact the porn industry faces everyday issues that other businesses have, it will continue to thrive in this environment through the use of advertising and technological advancements.

34. **The Role of Pornography in Sex Education**
    Presenter(s): Harper Mays, Rockie Rosenberg
    Advisor(s): Dr. Ian Barnard

Pornography can be a valuable source for teaching sexual health and pleasure to students. Many individuals have limited knowledge of sexual anatomy beyond the basic male and female reproductive organs. Pornography can provide an accurate visual representation of sexual organs and their functions. This can help individuals understand their bodies and how they work, promoting healthy sexual development. Pornography can also expose individuals to a wide range of diverse sexual pleasures. These different perspectives presented in porn can also help individuals understand that there is no right or wrong way to experience sexual pleasure and that everyone's desires are valid. Porn is an incredibly accessible and widely used medium that can help normalize discussions about sex. While porn is not a perfect representation of real-life sex, it can still provide valuable insights into sexual behaviors and desires. While there are certainly valid concerns about the use of porn in sex education, there are also compelling arguments for why it can be a useful tool for promoting healthy sexual behaviors – something we hope to discuss in our presentation.

Peace Studies

35. **Influence of Gender Among Mediators**
    Presenter(s): Emma Drake
    Advisor(s): Dr. Hilmi Ulas

Gender - and particularly the way it is interpreted by women - is often an under researched topic, including within the field of mediation. I am investigating how female mediators perceive their own experiences in their career in relation to gender. It is important that within fields concerning conflict resolution and justice work, there is also a continuous address of the ways in which societal norms have an impact. For this research, I have intentionally chosen to have interviews with professional mediators because gaining insight into their experiences requires personal accounts and reflections. The interview data will be interpreted using feminist and narrative theory in conjunction, observing how the stories of these women

connect with gender norms. I am utilizing thematic tagging through narrative analysis, meaning that I am looking for core narratives based around gender between the subjects. Since the interviews are under thirty minutes each, the narratives will be rooted in topical stories. Based on a review of the current literature on women in mediation and the data already collected through the interview process, it appears

that female mediators see gender as an underlying factor that does not always hold a primary role in their work. However, further research is always necessary, and the project calls for a deeper look into this topic.

Physical Therapy

36. Central Modulation of Spatial Postural Control Characteristics in Response to Task Demands and Fatigue in Individuals With and Without a History of Low Back Pain
Presenter(s): Jolene Soliman
Advisor(s): Dr. Jo Armour Smith

During limb movement, feedforward postural activation of the trunk and hip musculature occurs to maintain postural stability. This is called an anticipatory postural adjustment (APA), and APA impairments are associated with persistent low back pain (LBP). We hypothesized that individuals with LBP would demonstrate increased amplitude of APA activation in non-fatigued muscles following fatiguing exercise. Forty young adults participated: A LBP group with a greater than one-year history of functionally limiting LBP and a control group. Surface electromyography electrodes were placed bilaterally on the internal obliques (IO), external obliques (EO), biceps femoris (HS) and rectus femoris (RF). We used two versions of a leg raise task to examine APAs. One version, the supported leg raise (SLR), does not elicit trunk and hip APAs. The other, the unsupported leg raise (ULR), elicits APAs in the abdominals and hip musculature contralateral to the moving limb. The SLR and the ULR tasks were performed before and after paraspinal fatigue was induced by the Sorensen test at both a self-selected and fast speed. Amplitude of the APAs and speed of task performance (raise time) was calculated. ANOVA were used to test for main effects of task (SLR, ULR SLOW and FAST pre-fatigue, ULR SLOW and FAST post-fatigue) and group and task by group interactions. Raise time was faster for the ULR FAST than the ULR SLOW. Raise time did not differ between groups and remained the same post-fatigue. For all muscles, APA amplitude increased with task difficulty and task speed. For right and left EO, there was a significant task by group interaction. For both muscles, amplitude of activity increased for ULR FAST pre-fatigue, but this speed-dependent increase in amplitude did not occur in the LBP group post-fatigue. Central modulation of APAs in non-fatigued muscles occur in response to fatiguing exercise to maintain postural stability and task performance. Modulation of abdominal muscle APAs in response to fatigue and task demands is impaired in young adults with a history of LBP.

Political Science

37. Voter Fraud and Fear of a Violent Overthrow of the US Government
Presenter(s): Adam Schwartz
Advisor(s): Dr. Ann Gordon

During the past two elections in the US, worries of voter fraud and manipulation have increased, and with that fears of the state of our democracy have increased as well. In this paper, I will analyze the connection between fear of voter fraud in recent elections and how fearful one is of a violent overthrow of the government. Using Chapman's Study of American Fears Survey from 2022, a nationally representative

sample of adults in the U.S, I predict a strong positive relationship between the two. I use data revolving around manipulation, social media misinformation, and political polarization to draw these conclusions. This data suggests that social media is the medium in which polarization flourishes, either by purposeful manipulation from foreign entities, or accidental misinformation from undereducated individuals. These fears have been worsened by the presidential candidates themselves as well as the mainstream media in order to foster the same attention and emotional investment that social media commands. In turn, this can result in events like riots of January 6, 2021. An intense race in American politics is nothing new, but misinformation and manipulation have worsened through each election since the rise of social media; Consequently, fears for the future of the nation intensify greatly.

38. **Why Education Matters: Understanding Islamophobia in the United States**
    Presenter(s): Cintya Felix
    Advisor(s): Dr. Ann Gordon

Since 9/11, there has been a significant increase in anti-Muslim racism which can be linked to misinformation, misconception, and stereotypes reinforced by a lack of an educational upbringing. In this paper, I examine the extent to which an individual's education level in the United States contributes to Islamophobia. Using an original data set of responses to the questions in the Chapman University Survey of American Fears (CSAF), I find a moderately strong relationship between the highest level of school an individual has completed or the highest degree they have received, and the degree to which they are afraid of Muslims. While it is true that various factors such as political affiliation, cultural background, and the media contribute to Islamophobia, a lower level of education will prove to be the main indicator of an increased Islamophobic perspective. Moreover, education can be used to inform non-Muslims regarding Islamic culture, enforce stricter regulations against Islamic discrimination, and ultimately decrease Islamophobia-related behavior like hate crimes. Education (or the lack of it) has tremendous power to challenge phobic attitudes and move beyond the traditional realm of what has historically been the norm in American society. Therefore, one's level of education can be traced as the reasoning behind growing Islamophobia in contemporary American society.

39. **Is Climate Change a Myth or Our Reality: The Effect of Media Usage on the Beliefs About Climate Change**
    Presenter(s): Leia Hernandez
    Advisor(s): Dr. Ann Gordon

The subject of climate change has been a controversial debate for the past decade on whether it is real or just a myth. In this paper, the research that is found from the survey will examine the correlation between fear of climate change and media usage. The correlation between fear of climate change and a person's media usage will also demonstrate how media usage affects and shapes public opinion. The data associated with the fear of climate change was collected through the Chapman University on American Fear Survey (CSAF). The survey sample was conducted on 1035 participants which is a nationally represented sample. The sample will be used to conduct an experiment on the correlation between climate change and media usage, and how the two factors influence public opinion. The power of the media and how it shapes public opinion is crucial in understanding the actualities of climate change. It is

important to understand that public opinion can greatly influence urgent mitigation efforts to shape and influence policies to address climate change.

40. **American Media and American Fear of Terrorism**
    Presenter(s): Lukas Bubenheim
    Advisor(s): Dr. Ann Gordon

The broad range of media and its reach to the general population has resulted in a symbiotic relationship where the people's knowledge of current events and viewpoints of the world are dependent on what they are being told. Since the start of the 21st century, the rise in terrorism has grown tremendously both domestically within the United States as well as globally. With the efforts of terrorists to garner media attention in an attempt to spread their message, along with the the media's incessant coverage of such violence with its main focus on the types of terrorism taking place rather than the root cause of the issue, it has become evident that media's reporting of different acts of terrorism has lead to a difference in what kind of terrorism the public fears more, in spite of what governmental institutional data says otherwise. Therefore, this research will attempt to address how the media can manipulate the way in which people perceive terrorism, and how social biases like political, religious, racial play a role into this perception. Depending on which acts of terrorism are shown to the public, as well as how they are framed, it can tap into the public's preconceived notions and stoke social biases; turning a blind to what actual governmental data suggests is more threatening. This empirical work will seek to address the interactions between the American media and the general populace, and how it encourages those to think or believe in certain ways informed by the agenda put forth by these accompanying media outlets.

41. **Christian Nationalist Ideology and Racism**
    Presenter(s): Madeline Southern
    Advisor(s): Dr. Ann Gordon

As Christian nationalist beliefs have become increasingly mainstream in the political realm of our country, we have seen politicians blur the lines between Church and state, which is a direct threat to democracy. Christians in the political realm have begun to divide into factions, with one major faction being those that hold the belief that the United States should be a Christian nation, or Christian nationalist beliefs. In this paper I examine how Christian nationalist beliefs correlate to racist, xenophobic, and other bigoted views. Relying on the Chapman Survey of American Fears, a representative national sample of U.S. adults, I expect to find that holding Christian nationalist beliefs is an indicator of racist or xenophobic beliefs. I expect to find that degree of religiosity actually has a strong negative correlation with racist or xenophobic beliefs. These findings indicate that these ideologies do not actually stem from Christian beliefs, but rather that they come from the Christian nationalist ideology. The United States has no official religion and prides itself on the separation of church and state, and these findings point out that holding and encouraging Christian nationalist views has a direct correlation to hateful belief systems. This is even more evidence as to why in our country, religious freedom and separation from government is of the utmost importance.

42. Conspiracy Beliefs: A Threat to Political Stability
Presenter(s): Robert Arellano
Advisor(s): Dr. Ann Gordon

The United States may be the most powerful nation on Earth, yet its people still have endured both hardships and tragedies. Events such as the assassination of Martin Luther King Jr., the terrorist attacks on September 11th, the AIDS crisis, and the bombings of Pearl Harbor are all tragic events that have influenced American cultural fears. But the trauma and painful memories of tragic events have led some Americans to question any form of authority, even without evidence. In this paper, I examine the extent to which distrust in authority and other institutions leads to conspiratorial thinking. Using original data from the Chapman Survey of American Fears, a nationally representative sample of adults, I find a relationship between conspiratorial thinking and feelings of hostility, powerlessness, and being unfairly disadvantaged. I expect to find that people of color and racial minorities are more likely to believe in conspiratorial thinking. Although there will always be people spreading disinformation, conspiratorial thinking threatens the stability of the American political system, and this research illuminates the conditions under which it thrives.

43. Latino Political Alignment: A Developing Phenomenon
Presenter(s): Dairian Bowles
Advisor(s): Dr. David Shafie

Recent decades have seen a steady rise in the Latino population in the United States, especially in Florida, California, and Texas. This has resulted in a swath of new voters eligible for political consideration and incorporation into the body politic. Commonly, minority groups, such as African Americans and Asian Americans, have been considered entrenched, nearly axiomatic votes for the Democratic Party. The same logic has also been applied to the Latino population. Research indicates that Latinos largely vote Democrat due to preoccupation with myriad issues, chief among them being immigration, the state of the economy, and education. This common-sense standing that the Latino vote is securely Democratic was thrown into disarray when Donald Trump received a notable increase in votes from Latino voters. This, paired with Trump's inflammatory rhetoric aimed at Latin American immigrants, particularly Mexican immigrants, suggests that the issues prioritized by the Latino electorate, immigration chief among them, are not easy to discern, as previously theorized. This paper seeks to analyze the Latino electorate in the United States, paying particular attention to the vast array of different backgrounds, values, and histories cast under the umbrella term "Latino." Using the Latino Immigrant National Election Survey from 2016, this paper will investigate Latino immigrants specifically, determining which factors affect attitudes toward Trump. The plurality of the Latino electorate is expected to significantly affect attitudes toward Trump. This plurality includes religious salience, ties to the country of origin, gender, and political state of the home country. Each of these variables, and more, are expected to have significant impacts.

44. **Political Identification and Economics: How Party ID Impacts Perceptions of the United States Economy**
    Presenter(s): Dylan Hartanov
    Advisor(s): Dr. David Shafie

The economy of the United States of America holds many issues in modern day politics. Since the Great Depression of the 1920s to the Recession of 2007 to 2009 the health of the economy is very important to most Americans. In this study the focus of research will be the correlation between perceptions of the economy and party identification. This will be done through a series of hypotheses that will aim to identify from either side of the isle whether there are similar or different thoughts and beliefs about the economy and how it should be handled. This project analyzes data from the 2020 American National Election Study to examine the relationship between partisanship and perceptions of the economy. Those who identify as Republican will have economic beliefs that hold that the free market is the better solution to modern economic problems and will be overall more concerned about the state of the national economy. Democrats on the other hand will feel that the government will be better at controlling and sustaining the economy. In addition to this Democrats will be in support of a larger government and will be more worried about the effects of COVID on the national economy. Economic beliefs and perceptions are different among the political parties of the United States and it is clearly shown in the news, debates, and policies. This study aims to show the polarization of economic perceptions but also where common ground could be found between the two political parties.

45. **Climate Change & Extreme Weather**
    Presenter(s): Halle Mitchell
    Advisor(s): Dr. David Shafie

There has been a significant increase in public awareness of climate change and its potential impacts on the environment and society. This awareness has been driven by a variety of factors, including media coverage, political action, and personal experiences with extreme weather events. In this research paper, the main question will be how has an awareness of climate change changed over the last 20 years? The frequency and severity of weather-related incidents, like hurricanes, wildfires, flooding, and drought, will be examined to identify if these natural events raise awareness among the public about climate change. This project analyzes data from the National Surveys on Energy and Environment (NSEE) to examine the relationship between awareness of climate change and extreme weather events. The evidence indicates that an increase in global warming awareness has occurred among those who feel impacted by extreme weather. Additionally, there is a strong correlation between climate change awareness and extreme weather events in the United States. However, despite this increased awareness, there is still much work to be done to address the issue, and there are many challenges that must be overcome in order to achieve a sustainable and resilient future.

46. A Study of Public Support for Climate Change Mitigation Since 2017
Presenter(s): Katie Oftelie
Advisor(s): Dr. David Shafie

In the year 2020, the world experienced an event so cataclysmic that no single person escaped without their lives being completely changed. If you haven't contracted COVID or lost someone to COVID in the last 3 years, you know many people who have. Along with this disease of the body, we have also been forced to reckon with a disease that infects our planet. Climate change due to excess greenhouse gas in the atmosphere plagues us even when we all mask up and social distance. Public engagement is the key to our response to a crisis this severe, and you cannot acquire or maintain public engagement without swaying public opinion. Because we were not successful in maintaining positive public opinion for a strong COVID mitigation, we continue to deal with its consequences on public health. The purpose of this paper is to prove the increase of positive public opinion to an increased climate change response over the last 6 years. I will do this by first examining the background of three cornerstone events in climate politics that have shaped public opinion on climate action. Then, with the help of the Chapman Survey of American fears, a representative national survey of U.S. adults, I plan to demonstrate a causal relationship between the passage of time and increased public support of the fight against climate change.

Psychology

47. Multidimensional Perfectionism, Emotion Regulation, and Depression: An Analysis of the 2x2 Model
Presenter(s): Natalia Miranda
Advisor(s): Dr. Desiree Crevecoeur-MacPhail

Studies examining multidimensional perfectionism and emotion regulation have generally portrayed positive associations between adaptive perfectionism (e.g., setting high personal standards) and beneficial regulation strategies, and also between maladaptive perfectionism (e.g., concerns over making mistakes and doubts about actions) and harmful regulation strategies. This contributes to numerous outcomes, including mental health, as emotion regulation strategies have been associated with psychological adjustment. The 2x2 model of perfectionism (Gaudreau & Thompson, 2010) explains how the different dimensions of perfectionism interact to produce a perfectionistic subtype within an individual; however, relations between the subtypes and emotion regulation strategies have revealed unexpected results. The current study hypothesized that personal standards perfectionism (i.e., internal desire to strive towards exceptionally high standards created by the self) is positively correlated with cognitive reappraisal, that evaluative concerns perfectionism (i.e., harsh self-evaluations, and low self-efficacy) is positively correlated with rumination and suppression, and that rumination will positively predict depression while statistically controlling for suppression. To measure these variables, students from Chapman University completed an online questionnaire which included several reputable scales. Significant results would emphasize the importance of the perfectionistic dimensions in dictating how individuals manage their emotions while also indicating that rumination is a stronger predictor of depression than emotional suppression. Such results would imply that psychotherapists can guide perfectionists through troubling life circumstances by directing them to utilize certain emotion regulation strategies over others.

Additionally, clinical psychologists would be able to use this information to adequately help those diagnosed with depression, who may also display perfectionistic tendencies, by focusing on how to change ruminative thought patterns.

48. **Diverse Sexual Behaviors and Desire for Casual, Monogamous, and Consensually Non-Monogamous Relationships During the COVID-19 Pandemic when Vaccines were First Available**
    Presenter(s): Manya Dhupar, Emily Foster
    Advisor(s): Dr. Amy Moors

Decades of research have found a consistent gender difference in sexuality: men tend to desire short-term and casual relationships, and women desire monogamous relationships (Petersen & Hyde, 2010; Moors et al., 2013). The COVID-19 pandemic provides a context that may shift a person's desires for sexual activities or types of relationships. Recent research suggests that the pandemic allowed many people to reevaluate their intimate lives and lower their interest in monogamy (Masterson et al., under review). Also, Lehmiller and colleagues (2021) found increased exploration of sexual activities (e.g., sexting).
In the present study, we analyzed data from a national sample of single people in the U.S. as part of The Kinsey Institute's annual Singles in America study (N = 5,000; 57.3% identified as women; 42.5% identified as men). Data were collected in June-August in 2021 when the first series of COVID-19 vaccines became available to the general public. Results show: 48.1% of people indicated a desire for casual relationships (one-night stands, friends with benefits, casual sex), 45.5% of people indicated a desire for monogamous relationships (sex within a committed/exclusive relationship or marriage), and 17% reported desire for consensually non-monogamous relationships (open sexual relationship, sex relationships with multiple partners). In regards to engagement in diverse sexual behaviors during the pandemic, 19.5% of people indicated engagement in internet-based sexual activity (cybersex, sharing of explicit photos, and an exclusively online sexual relationship), 8.7% had phone sex, 5.9% had sex in a public place, 5.2% filmed sex, and 4.3% engaged in a sexual affair.
Future analyses will examine potential gender and sexual orientation differences in engaging in diverse types of relationships. We hypothesize that men and sexual minorities will most desire consensually non-monogamous relationships. We also predict that contrary to previous research, there will not be a gender difference in sexually diverse behaviors and desire for casual relationships.

49. **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 inattentional blindness. With these contrasting manipulations, we will assess the overlap in putative correlates in response to the very same visual stimuli and in the same human subjects. By triangulating across the three manipulations, we will be focusing on the commonalities in their results, with the goal of isolating NCCs that can generalize across experiments. 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.

Software Engineering

50. Deepfakes: How Technology is Affecting the Porn Industry
Presenter(s): Lauren Szlosek
Advisor(s): Dr. Ian Barnard

Deepfakes are a rapidly evolving technology that allows the creation of manipulated media content, such as images and videos, that are difficult to distinguish from real ones. One industry that has been heavily impacted by deepfakes is the porn industry, where the technology has been used to create non-consensual and often illegal content featuring celebrities and other individuals. This poster presentation explores the impact of deepfakes on the porn industry and the ethical and legal implications of their use. The presentation highlights how deepfakes have made it easier to create pornographic content without the consent of the people featured in it, leading to issues of privacy violation, exploitation, and harassment. The presentation also explores the challenges in detecting and preventing deepfake content in the porn industry. Deepfakes are often created using sophisticated artificial intelligence algorithms, making it difficult for traditional content moderation techniques to detect them. Furthermore, the decentralized nature of the internet makes it challenging to remove deepfake content once it has been uploaded. Overall, this presentation will evaluate this growing problem and how it affects not only those affected by the content but also the porn industry as a whole.

51. Quantitative Image Analysis of Bright Field Microscopy Images for Micro-Gels
Presenter(s): Arian Tajvar
Advisor(s): Dr. Andrew Lyon

Bright field microscopy is a widely used imaging technique for studying small-scale traits of biomaterials, such as micro gels, which have significant applications in various fields including biomedicine, soft matter physics, and materials science. However, quantitative image analysis of micro gels presents challenges due to the difference in refractive index between the micro gel and the surrounding medium, which is typically an aqueous solution. This refractive index mismatch can cause ambiguity in distinguishing particles within the image and lead to inaccurate measurements of micro gel features.
Accurate quantitative image analysis is essential for characterizing micro gel properties such as size distribution, morphology, and mechanical properties. However, standard image analysis tools such as the open-source software application "Fiji" may not be suitable for analyzing micro gel images due to their

unique characteristics. Therefore, developing specialized algorithms and tools for analyzing micro gel images is necessary. In this study, we explore the challenges of quantitative image analysis of micro gels taken by bright field microscopy in the presence of refractive index mismatch. We investigate the development of a Python-based implementation of image analysis tools using the OpenCV library, which offers a more flexible and adaptable approach to analyzing micro gel images. The focus of the research study aims to provide insights for the development of specialized algorithms of micro gel image analysis and offers a useful tool for accurate and efficient quantitative analysis.

Biological Sciences

1. **Utilizing Tie2-GFP mice to elucidate the in vivo interactions of oxidatively-stressed RBCs and the brain endothelium**
   Presenter(s): Rudy Chang
   Advisor(s): Dr. Rachita Sumbria

Cerebral microhemorrhages (CMH), which occur most commonly within the elderly population, are heavily associated with disorders involving cognitive deterioration such as dementia. The most common mechanism for CMH development involves structural abnormalities and disruptions to the brain vasculature that result in the passage and migration of red blood cells (RBCs) into the brain parenchyma. The neuro-inflammatory response that follows a CMH ultimately changes the brain microenvironment while trying to remove blood-derived cells and their degraded byproducts. Our previous in vitro work demonstrated that oxidatively stressed RBCs could undergo erythrophagocytosis by brain endothelial cells, and this may be a novel mechanism for non-hemorrhagic CMH development. Our latest work on the blood-brain barrier focused on extending our in vitro observations to in vivo systems and studying the interactions of RBCs, brain endothelium, and microglia. Utilizing Tie2-GFP mice with endothelium that express GFP, we injected fluorescently labeled RBCs to study the interactions of the brain endothelium with RBCs that were subjected to oxidative stress. We were able to confirm our in vitro observations in vivo, illustrating significant attachment of oxidatively stressed RBCs to brain endothelium. We also found a robust microglial response to incursive RBCs, illustrating the brains' neuroinflammatory response. Additionally, we found increased hemosiderin-iron within the brains of mice that were subjected to oxidatively stressed RBCs indicating increased CMH formation in these mice. Collectively, our results suggest a role of erythrophagocytosis of aged RBC and microgliosis in CMH formation in mice.

Business

2. **Business Strategy and the Metaverse**
   Presenter(s): Stephanie Mohl, Tod Brewster
   Advisor(s): Dr. Cristina Nistor, Dr. Niklas Myhr

The Metaverse is expected to become an important part of the business world of the future. Mainstream companies like Walmart, Salesforce, Audi, Nike, and many others have established a presence with virtual goods (NFTS), spaces for consumers to interact, and employees to collaborate and train. Yet there is little research into Metaverse strategies that are efficient and sustainable over time. We researched the top 500 global brands to uncover lessons from the many Metaverse entry approaches taken and our work has practical implications for business managers looking to make impactful entrances into this space. Firms selling physical products are entering with NFTs and spaces for customers to engage with products virtually. Energy firms are using augmented reality to help employees engage with infrastructure with added information through headset usage. Banks are creating virtual spaces where customers can learn more about financial products offered. Ultimately, each industry has begun adopting strategies unique to

their products, needs, and the needs of their customers. Our research aims to identify these similarities and differences in an effort to determine the viability both in short term and long.

Food Science

3. **Single-Laboratory Validation for the Detection of Salmonella enterica in Meat Analog Products**
   Presenter(s): Amanda Tabb, Biola Fatusin, Sam Covaia
   Advisor(s): Dr. Rosalee Hellberg, Dr. Donna Williams Hill

Plant-based meat alternatives are becoming increasingly popular for health, environmental, and ethical reasons. Meat alternatives are projected to grow to become a $23.2 billion global industry by 2024. In order to meet the demands of consumers, a variety of plant protein sources are used in meat-alternative products. Currently, the Bacteriological Analytical Manual (BAM) calls for pre-enrichment using lactose broth (LB) with added surfactants, Tergitol Anionic 7 or Triton X-100, depending on fat content, and screening using the VIDAS method for the identification of Salmonella in meat alternative products. Surfactants are used in these protocols to help reduce the surface tension in the liquid and are typically used for higher-fat products. However, it is currently unknown as to whether surfactants are necessary for use with meat analogs, which vary in their fat content. Following pre-enrichment, screening with VIDAS is recommended in the BAM. While VIDAS is an effective screening method, it requires costly equipment that is not universally found in laboratories, and it is relatively time-consuming. Potential alternatives to VIDAS are real-time PCR or loop-mediated isothermal amplification (LAMP). Therefore, the goal of this study to optimize the procedures for pre-enrichment and screening of meat analogs for the detection of Salmonella in meat analogs. Specifically, we will test the efficacy of the following pre-enrichments: LB with Triton X-100, LB without Triton X-100, and buffered peptone water (BPW). We will also test the efficacy of screening methods, specifically the use of real-time PCR or LAMP, as alternatives to VIDAS. The results of this study have the potential to impact how FDA and other agencies globally conduct regulatory testing for Salmonella in meat analog products.

4. **Labeling Compliance, Species Authentication, and Short Weighting of Frozen Shrimp Sold in Grocery Stores in Southern California**
   Presenter(s): McKenna Rivers, Alexia Campbell, Chris Lee, Pragati Kapoor
   Advisor(s): Dr. Rosalee Hellberg

While shrimp is the most-consumed seafood product in the United States, there is a lack of research into the extent of short-weighting and mislabeling of shrimp in the marketplace. The objective of this study was to investigate frozen shrimp for Country of Origin Labeling (COOL) compliance, species authentication, acceptable market names, net weights, and percent glaze. A total of 106 frozen shrimp packages were purchased from grocery stores in Southern California. Samples were determined to be COOL compliant if both the procurement method and country of origin were reported at the point of sale. Species authentication and acceptable market names were determined by comparing the species identification based on DNA barcoding to the acceptable market names on the FDA Seafood List. Net weights and

percent glaze were determined by taking the weight of each sample before and after deglazing according to AOAC methods. The determined net weight of each product was compared to the declared net weight to determine if samples had been short-weighted, taking into account the maximum allowed variance (MAV) by the National Institute of Standards and Technology (NIST) standards. Overall, 95% of samples were compliant with COOL; two samples did not indicate the production method and three had conflicting country of origin information on the label and placard. The average percent glaze was 16.6%, with 26% of samples having >20% glaze. Short weighting was detected in 37% of samples, with the greatest proportion of incidents recorded for the super/extra colossal shrimp category (57.1%). Species mislabeling was observed in 25% of samples, with conflicting market names, species substitution, and/or use of unacceptable market names. The results of this study indicate a high level of COOL compliance but suggest a need for increased scrutiny of species mislabeling and short weighting of frozen shrimp.

Health & Strategic Communication

5. **The Effects of Anxiety on Companionate Love in the Context of the Theory of Resilience and Relational Load When One Partner is Infected with COVID-19.**
   Presenter(s): Megan Williams, Amanda Robertson
   Advisor(s): Dr. Jennifer Bevan

Our project will be titled “The Effects of Anxiety on Companionate Love in the Context of the Theory of Resilience and Relational Load When One Partner is Infected with COVID-19.” For this project, we will be specifically looking at the ways in which partners may experience significant anxiety when taking on a caregiving role, and how this may affect a relationship in the long term. We would like to identify how our theory relates not just to anxiety, but also companionate love. We hypothesize that the Theory of Resilience and Relational Load will help us to explain the relationship between anxiety and a caregiving partner, and also explain the ways in which it allows for partners to experience companionate love even in a caregiving context that may put stress on the relationship. Based on an online quantitative survey data (N = 505 romantic partners) currently being analyzed, we expect to find that in partners who are not sharing an equal relational load, the anxiety will be higher for the caregiver, and the feeling of companionate love lower. For partners who feel that the relational load is shared more equally, prevalence of anxiety will be lower, and companionate love will be higher. This research is important and relevant because COVID-19 is still an ongoing health risk, and we aim to explore the ways in which it can affect intimate relationships as well.

Pharmacy

6. **Economic Analysis of CAR T-Cell Therapies for Relapsed/Refractory Follicular Lymphoma**
   Presenter(s): Buthainah Ghanem, Marc L. Fleming, Lawrence M. Brown, Rosa Rodriguez-Monguio
   Advisor(s): Dr. Enrique Seoane-Vazquez

Background: Axicabtagene ciloleucel (axi-cel) and tisagenlecleucel (tisa-cel) are chimeric antigen receptor (CAR) T-cell therapies used to treat adult patients with relapsed or refractory follicular lymphoma (rrFL)

after two or more lines of systemic therapy. However, no head-to-head clinical trials have been conducted to compare them.

Objective: This study aimed to compare the efficacy, safety, and cost of axi-cel and tisa-cel in the treatment of adult patients with rrFL after at least two lines of treatment.

Method: Overall response rate (ORR) and safety signals were compared using reporting odds ratios (RORs) with 95% confidence intervals (CIs) at p < 0.05. Progression-free survival (PFS), duration of response (DoR), and overall survival (OS) were compared using the Kaplan–Meier method with a log-rank test. Cost and cost-minimization analyses of drug acquisition, drug administration, serious adverse events (AEs), and relapsed management were calculated. Costs were extracted from the IBM-Micromedex Red Book, Centers for Medicare and Medicaid Services, and existing literature. Patient characteristics were compared using the chi-square test. Statistical analyses were conducted using Microsoft Excel and R version 4.0.5.

Results: No statistically significant differences were observed between axi-cel and tisa-cel in terms of ORR, DoR, and OS (p > 0.05). PFS was significantly better with tisa-cel (p < 0.05). Axi-cel was significantly associated with higher incidences of CRS, neurologic events, and grade 3–4 AEs than tisa-cel (ROR > 1, p < 0.05). Axi-cel and tisa-cel cost $512,021 and $450,885 per patient, respectively, resulting in savings of US$61,136 with tisa-cel over axi-cel.

Conclusion: Tisa-cel appears to have a better safety profile, fewer serious AEs, lower mortality rate, and lower cost than axi-cel.

Biochemistry and Molecular Biology

1. **Optimizing Collagen-Microgel Composites for Tissue Engineering**
   Presenter(s): Elif Narbay, Anne Marie Santich
   Advisor(s): Dr. Andrew Lyon

Regenerative medicine is a rapidly advancing field aimed at restoring damaged organs or tissues in the human body. One area of focus is tissue scaffolding and engineering, where collagen composites have shown great potential due to their biocompatibility and similarity to the body's extracellular matrices. However, collagen has limitations that can affect its usefulness in tissue engineering. One of the most significant issues is that it is relatively weak, making it unsuitable for tissues that are under load, or for use in scaffolds that require surgical handling. We are studying how incorporating microgels can improve collagen's mechanical properties to further enhance the potential of collagen composites for tissue engineering applications. Our group uses ultra-low crosslinked poly(N-isopropylacrylamide) microgels, which are composed of over 99% water because of their low degree of cross-linking. The Lyon group has already demonstrated the potential of incorporating microgels in fibrin composites to enhance their mechanical properties. By forming microgel pockets within the fibrin, these composites exhibited better structural stability and were more permissive to cell proliferation and invasion. In this work we report the successful development of collagen composites with microgels at various concentrations and characterized them utilizing optical microscopy imaging. Unlike the fibrin composites, we have observed seamless integration of the microgels without the pockets. Moving forward, we aim to conduct more detailed studies on the mechanical and rheological properties of these composites and perform quantitative analysis of collagen structural changes. To achieve this, we will synthesize fluorescently labeled microgels, incorporate them into the collagen and obtain images to better depict the structural differences. Additionally, we plan to test the bioprintability of these composites and assess their effectiveness in promoting cell growth. Overall, this research represents a promising step forward in the field of regenerative medicine.

2. **Engineering a Lactobacillus Helveticus Esterase for Greater Activity**
   Presenter(s): Brianna Dinn, Destiny Ly, Kylie Sacapano
   Advisor(s): Dr. Cedric Owens, Kellie Omori

Chlorogenic acid (CGA) esterase hydrolyzes CGA into caffeic and quinic acid. Our group previously demonstrated that CGA hydrolysis prevents formation of an unwanted green pigment that is produced when CGA reacts with amino acids in sunflower flour during baking applications. Here, we describe our efforts to engineer CGA esterase to be more active and able to prevent greening more efficiently in order for sunflower flour to be more widely used in the food industry. Although CGA esterase from Lactobacillus helveticus is one of the most active CGA esterases known to date and is thermostable, its activity is lower than related esterases that act on substrates similar to CGA. Lactobacillus helveticus CGA esterase is being engineered by identifying flexible structural regions using B-factor analysis and targeting these regions by iterative saturation mutagenesis. This approach has been shown to increase the turnover rate in other enzymes. After mutagenesis, CGA esterase mutants are initially screened for rapid CGA hydrolysis using a

96-well spectrophotometric assay. Mutant screening is also being performed at different temperatures to assess thermostability and the effect of temperature on mutant activity. The most active mutants are then selected for further characterization. This poster describes ongoing work. Thus far, screening has identified mutants with similar activity as the wild type enzyme but has yet to identify ones with higher activity. Mutant screening is therefore still in progress until a mutant with higher activity and thermostability is found.

3. **Determining Where the Protective Protein, CowN, Binds to Nitrogenase**
   Presenter(s): Mitchell Underdahl
   Advisor(s): Dr. Cedric Owens

Nitrogenase is the only enzyme that can reduce nitrogen gas (N2) into the plant nutrient ammonium (NH3). Carbon monoxide inhibits nitrogenase by binding to its active site and preventing NH3 production. The protein CowN interacts with the Molybdenum-Iron Protein (MoFeP) component of nitrogenase. The interaction weakens CO's inhibition constant, thereby protecting nitrogenase from CO. The aim of this work is to determine how CowN and MoFeP interact through mutational analysis and protein crosslinking. We hypothesized that CowN binds MoFeP using its C-terminus and that CowN binds MoFeP either near its active site and/or at the entrance of a gas channel. Mutations were made on the C-terminus of CowN. Mutations at glutamate 87 (E87) prevent crosslinking, which indicates that E87 is necessary for protein-protein interactions to occur. Mutations at other C-terminal sites did not abolish crosslinking, suggesting E87 has a key role in establishing the interaction with MoFeP. To detect where on MoFeP's surface CowN binds, crosslinking was conducted with SIAB, which crosslinks sulfhydryl groups withs primary amines. These experiments were conducted with both wild-type CowN and a CowN mutant that did not have any cysteine residues. Both wild-type and the no-cysteine mutant crosslinked equally well. This indicates that the sulfhydryl-reactive group of the crosslinker binds to MoFeP and thus that CowN binds to a site on MoFeP that features a cysteine. These results narrow down CowN binding to three cysteine-containing surface sites on MoFeP. The aim of future work will be to identify which of the three sites is the target for CowN binding.

4. **Analyzing Interactions of Calmodulin with Viral HIV-1 Matrix Protein**
   Presenter(s): Andrea Sandoval
   Advisor(s): Dr. Jerry LaRue

Human immunodeficiency virus (HIV) attacks the immune system and if left untreated, could cause acquired immunodeficiency syndrome (AIDS). The HIV matrix protein (HIV-MA) is involved in replication and regulation of the HIV virus. Calmodulin (CaM), a calcium-binding protein found in all eukaryotes, has a potential role in the viral replication of HIV-MA which plays a key role in the replication of HIV. In order to investigate the interactions between calmodulin and the HIV-MA, a series of titrations with CaM are performed using circular dichroism. Circular dichroism (CD) uses circularly polarized light to observe the secondary structure of a molecule. The circularly polarized light is broken up into left and right components. When the molecule contains a chiral center, the left and right components are absorbed to different extents, and the differential absorption is measured with CD. Through a series of titrations, the

chemical environment is changed in small increments so the molecule will experience conformational changes. As the conformation changes, CD is used to measure the ellipticity which provides a better understanding of the secondary structure that is a result of these chemical interactions. Since CaM plays a potential role in the viral replication of HIV-MA, CD is used to investigate the protein-protein interactions and conformational changes.

5. **Analyzing Conformational Changes in the Binding of HIV-1 Matrix Protein, N and C Terminals, to Calmodulin**
   Presenter(s): Nousha Karimi
   Advisor(s): Dr. Jerry LaRue

Worldwide, more than 38 million people are living with human immunodeficiency virus (HIV), about 84 million people have become infected with HIV since the start of the epidemic, and 40.1 million of those diagnoses led to death. HIV Type-1 is the most common type of HIV, attacking the body's immune system by destroying CD4 cells. The virus attaches itself to the CD4 cell, taking control of its DNA and replicating itself to release more HIV into the bloodstream. The Gag proteins of HIV-1 are crucial players in the virus' assembly, release, and maturation; it utilizes its essential matrix protein (MA) to target the plasma membrane, allowing the virus to continue its replication cycle. Calmodulin (CaM) is a calcium-sensing protein that acts as a regulator molecule in many cellular functions. When calmodulin is bound to the HIV-1 matrix protein, two alpha helices form instead of the typical one, which has yet to be fully understood. Current research has suggested that in the binding between HIV-1 MA and CaM, the myristyl group within the MA becomes exposed and anchors down to the plasma membrane. CaM has been shown to be upregulated in the presence of HIV infections, and this rise is correlated to the increased accessibility of the MA's binding sites. The matrix protein also contains tryptophan — a fluorescent compound that varies in intensity based on conformation type — which can be observed through fluorescence spectroscopy and anisotropy techniques. These binding effects are hypothesized to facilitate increased viral production of HIV-1, implying that the hindering of the matrix protein binding site could lead to reduced viral replication. This project uses fluorescence spectroscopy to examine and analyze these interactions between HIV-MA and CaM in the presence and absence of calcium.

Biological Sciences

6. **Aqueous Extracts of Fabiana Imbricata as a Natural Therapeutic Treating Breast Cancer**
   Presenter(s): Evan Hughes, Keon Jafari
   Advisor(s): Dr. Marco Bisoffi

Breast cancer is the second most common cancer in women, and about 1 in 3 new cancers found in women is breast cancer. The American Cancer Society has predicted almost 300,000 new breast cancer cases for 2023 alone. Currently, mainly radiation therapy, surgery, and chemotherapy are used, although more recently, natural therapeutics have seen some promise as a treatment option. The goal of this project was to test the potential anti-breast cancer activity of aqueous extracts from the plant Fabiana imbricata. This Peruvian shrub holds many secondary metabolites and is already used as a diuretic. Extracts at different

concentrations were used to treat three different types of breast epithelial cell lines: MCF10A - noncancer control, MCF7 - early-mid stage breast cancer, and MDA-MB-453 - late-stage breast cancer. Cell toxicity was measured using the WST formazan-salt metabolic conversion assay and cell death was measured using the methylene blue assay. Our first results suggest a non-differential inhibitory effect on cell metabolism in all three cells and a somewhat differential induction of cell death in cancer cells. However, the latter was not confirmed by fee-for-service molecular assays performed elsewhere. Nevertheless, the paucity of literature on F. imbricata extracts as potential anti-cancer therapeutics warrants further investigation, thereby including related species with high levels of secondary metabolites.

7. **Lipopolysaccharide Downregulates Non-Bacterial Immune Responses**
   Presenter(s): Chathuni Liyanage
   Advisor(s): Dr. Patricia Lopes, Dr. Michael Ibba

Pathogen defenses can take on many forms whether they be behavioral, physiological or genetic. When faced with an infection risk there are observable behavioral changes known as sickness behaviors which can manifest in the form of decreased activity and avoidance behaviors, along with physiological adaptations. Despite the abundance of studies examining immune responses in different species, the link between physiological and transcriptomic responses are much less understood. Additionally, the differential expression of genes involved in the immune response may unveil important implications for the long term effects of infection. Using next generation RNA sequencing, a profile of the differential gene expressions are created to quantify the whole blood gene expression responses to an immune challenge. In this study, we examined how LPS-induced immune system activation affected Japanese quail (Coturnix japonica) behaviors and blood profiles. The blood transcriptome was selected for our analysis because it provides a detailed and global image of an animal's physiological state but also enables the analysis of both immune and non-immune related responses. Infections can be local and/or systemic and by examining the blood of these organisms, we can measure the effects of systemic infection. We predicted that LPS-treated would exhibit sickness behaviors such as reduced eating and drinking along with decreased duration of standing. Pertaining to their blood transcriptome, we predicted an upregulation of immune pathways and stress responses along with a downregulation of nonessential pathways or mechanisms such as nonspecific responses. There were 627 significantly differentially expressed genes amongst the treatment and control group, with 429 of them being downregulated and 198 upregulated. Behavioral data collected from treated individuals was consistent with expected sickness behaviors demonstrated in previous studies. The suppressed pathways revealed a potential energetic trade-off between immune specific responses and non-specific responses to maximize immune pathways to rid the host of infection.

Business

8. **Social Media Authenticity: How Authenticity is Portrayed and Perceived by Consumers**
   Presenter(s): Emma Han
   Advisor(s): Dr. Charlene Chu

Social media is an avenue for brands, celebrities, and influencers to have direct communication with their audience; however, with so much information existing on the Internet, it can be hard to discern whether said communication is authentic to the creator and truthful to consumers. This research study explores what types of content and trends contribute to the perception of authenticity in social media. Collections of varied Instagram posts from multiple creators, categorized by the relative perfection of the image itself and its corresponding text caption, were compiled into a survey. Survey participants rated each post and influencer on an authenticity scale and reported both conceptual and dispositional persuasion knowledge. These findings can be applied to better understand advertising strategies brands use to portray themselves and the information they communicate to their audience at large.

Chemistry

9. **Manganese Removal via Different Mineral Surfaces Under Varying Acidic and Oxygenated Conditions**
   Presenter(s): James Hazen
   Advisor(s): Dr. Christopher Kim, Dr. Miranda Aiken

Manganese is a pollutant in groundwater that undergoes a redox cycle that can affect other redox-sensitive elements. The goal was to remove manganese from a solution of manganese chloride via different mineral surfaces while varying pH levels and oxygen presence while normalizing surface area. The surface area was removed to compare the chemical properties of the mineral surfaces. This was done by adding a 2mM manganese solution to a measured amount of goethite, bentonite, or kaolinite. The mass of the mineral surface varied on the surface area of each mineral, which was then normalized. The pH of the mixture was adjusted to between 6 and 8.5 before being placed on a shaker table for an hour. The mixture was centrifuged, filtered, and acidified to below pH 2 for analysis via ICP-OES. This was then repeated in an anaerobic chamber to remove the presence of oxygen. The PZC and surface area of each mineral were also measured. It was hypothesized that when the surface area is normalized, if there was a significant difference in the amount of manganese removal between the different surfaces, then the chemical properties of each mineral surface play a role in manganese removal. On the chosen mineral surfaces, bentonite is the most reactive, followed by goethite, then kaolinite.

10. **Examining Photocatalyzed Reactions of the Surface of Au core/Transition Metal Shell Nanoparticles: The Importance of a Transition Metal Shell in Enhancing Reaction Outcomes**
    Presenter(s): Ishaan Shah
    Advisor(s): Dr. Jerry LaRue

Carbon Dioxide (CO2) is substantially involved in global warming, which negatively impacts human life and the environment. Many of the combustion reactions that output CO2 occur in the world's petroleum industries and automobiles. Gaining a better understanding of these reactions is crucial for creating hydrocarbon-based fuels, essential for reducing these emissions. The methods used by petroleum industries to produce fuels are energy exhaustive. It is necessary to develop more energetically efficient methods to produce syngas using green catalysts. Plasmons are potential catalysts because they can efficiently generate large amounts of electrons critical to excited state chemistry. Metallic surfaces or Nanoparticles (NPs) composed of plasmonic metals, such as gold (Au), silver (Ag), or copper (Cu), possess localized surface resonances and can adsorb molecules to their surface. When excited through visible light these surface plasmons can rapidly produce hot-electron carriers; however, these catalysts are not tunable. Reactions occurring on the surface of transition metal catalysts can be described through the d-band model, which expresses how d energy states of a transition metal surface interact with the electronic states of reactants. When the electrons within the d-band of a plasmonic metal are excited, they occupy molecule-surface antibonding states. The chemical reactivity of surface plasmons are limited by the position of antibonding orbitals relative to the Fermi level. Tuning the geometry and electronic structure of plasmonic NPs can help bring antibonding states closer to the Fermi level. Core/shell nanoparticles at 1/1, 2/1, 4/1, and ½ molar ratios were synthesized. Scanning Electron Microscopy Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Ultraviolet-Visible Spectroscopy (UV-vis), and Energy Dispersive Spectroscopy (EDS) will be used to characterize the structure and composition of the NPs. A better understanding of how to tune the geometry and electronic structure of Au NPs is essential to efficiently produce syn gas.

11. **Hot Electron Chemistry on Bimetallic Titanium Nitride Core-Shell Nanoparticles**
    Presenter(s): Stephanie X. Hoang
    Advisor(s): Dr. Jerry LaRue

The increase of CO and CO2 pollution. CO pollution can be mitigated by converting CO or CO2 into CH3OH (methanol) through the use of catalysts. Bimetallic transition metal core-shell nanoparticles consist of two transition metals and can be used as plasmonic photocatalysis for green fuels. These nanoparticles have unique optical and catalytic properties that contribute to their photocatalytic abilities. They efficiently generate hot electrons for use in excited state chemistry. This project focuses on bimetallic core-shell nanoparticles with Titanium Nitride (TiN) as the core metal. So far, ruthenium (Ru) and rhodium (Rh) have been used as the shell metal. The TiN/Ru and TiN/Rh nanoparticles (NPs) are synthesized using reflux reactions, washed using a centrifuge, and characterized using Scanning Electron Microscopy (SEM), Energy-dispersive x-ray spectroscopy (EDS), Transmission Electron Microscope (TEM), and Ultraviolet Absorption Spectroscopy (UV-Vis). Characterization of the synthesized bimetallic core-shell NPs depict favorable size, shape, and elemental distribution. The photocatalytic efficiency of the bimetallic core-shell NPs will be assessed through the combustion of oxygen and CO oxidation and hydrogenation reactions

using a Raman reactor chamber and Raman mass spectrometer in the near future. Through the use of bimetallic core-shell nanoparticles, we hope to understand their properties and use these promising catalysts to assist in creating renewable fuel.

Computer Science

12. **VRelax: A User-Centered VR Experience for Self-Expression and Relaxation**
    Presenter(s): Tyler Kay, Meghna Raswan, Scott Fitzpatrick, Katie Tang, Hector Camarillo Abad
    Advisor(s): Dr. Franceli Cibrian Dr. Trudi Qi

Recent research on Virtual Reality (VR) applications has provided promising evidence in supporting different health therapies beyond gaming. However, designing VR systems is challenging, especially when developing activities aimed at relaxing, as VR systems could be intimidating and overwhelming, especially for users with no previous VR experience. VRelax is a project focused on exploring how VR can be used to build a more relaxing experience for the user. In this project, we took the first step towards designing a VR experience allowing the users to express themselves through art creation for relaxation. Specifically, we used OpenBrush, an open-sourced painting software that allows users to create 3D art in VR for an immersive self-expression experience. To augment our understanding of user interactions and stress levels, we developed a multimodal data collection module based on VRMoVi, a VR-based data visualization system, to collect the user's VR head and hand motion tracking data, heart rate, and inertial sensor data for body motion tracking. In this manner, we could provide an enjoyable and accountable VR experience to the user, allowing us to get user feedback to design a more relaxing environment. Meanwhile, we will collect relevant information about their stress levels to complement their input. We hypothesize that by combining user feedback and biometrics measurement with VR, we could create an open-ended, user-centered environment where the user can self-explore, self-express, and relax in VR. Our next step is to conduct a human-subject study to evaluate our system design and collect user experience on the VR-based art creation environment for relaxation. Based on our findings, we will reiterate our system further to improve the proposed user-centered VR experience for relaxation.

13. **A Step Towards an Intelligent Human-Interactive Data Visualization in Virtual Reality**
    Presenter(s): Meghna Raswan, Tyler Kay, Scott Fitzpatrick, Katie Tang, Hector Camarillo Abad
    Advisor(s): Dr. Trudi Qi, Dr. Franceli Cibrian

Traditionally, data analysis relying on visualizations on 2D screens may limit the user's experience and ability to uncover meaningful patterns, especially for multidimensional, sophisticated data. In contrast, virtual reality (VR) offers an immersive experience with better spatial sensation, letting the user "step inside" the data with the potential for more intuitive interactions. Therefore, we proposed to use intuitive hand-controller-based gestures in VR to visualize the data and assist with human-data interactions. To this end, this project presents the first step towards developing machine learning (ML) models to automatically recognize the user's hand-controller gestures when interacting with the data in VR. Specifically, we proposed a list of intuitive hand-controller-based data interaction gestures and aimed to efficiently and accurately collect hand motion data and automatically label them with corresponding gestures. Thus, we have developed a novel, human-centered, VR-based data collection tool built upon VRMoVi, a VR-based

data visualization system. A sequence of computer animation-based visual prompts has been designed and implemented to guide the user through gesture perception and performance. In each animated prompt for a specific gesture, we demonstrated the movement of two hand-held controllers representing the gesture and an animation of a virtual object indicating the desired action applied to the data (e.g., zooming into the data). Our gesture data collection tool provides the user with feedback to visualize the gesture in real-time. We hypothesize that adding animated prompts helps communicate the intended gestures to the user. Our next step is to conduct a human-subject study to evaluate the usability and user experience of the proposed data collection tool and collect hand-controlled-based gesture data to train ML models for gesture recognition and integrate this model into VRMoVi to allow the user to interact with the visualized data more intuitively.

14. **Designing an Elastic Display to Support Musical Interaction for Children**
    Presenter(s): Ellie Nguyen
    Advisor(s): Dr. Franceli Cibrian

Research evidence supports that musical interaction enhances many areas of child development, including intellectual, social-emotional, motor, and overall literacy. This is especially true for children with Autism Spectrum Disorder (ASD), who may exhibit differences in sensory and motor skills. Although ideal for musical interaction, traditional musical instruments lack accessibility to children with ASD because they require excessive cognitive load and musical training. However, recent research in Human-Computer Interaction and Ubiquitous Technology has shown the ability of elastic interactive surfaces to facilitate musical interaction. Elastic surfaces can enable children to produce a wide variety of sounds simply by tapping, pushing, or pinching a fabric. Currently, we face the challenge that available elastic displays have complex set-ups and are expensive. In this work, we propose to create a more portable and cost-effective elastic musical display. The prototype combines input from an Intel RealSense depth imaging camera with Python code to detect the coordinates of the nearest point to the camera in real time. These coordinates will be interpreted as the user's interaction with the elastic fabric. Based on this interaction, we will use a portable ViewSonic projector with speakers to provide visual and auditory feedback. In future work, we plan to incorporate gameplay dynamics, which include open-ended and structured activities with challenges related to rhythm, pitch, and strength. This prototype will provide a novel approach to make musical interaction more accessible for neurodiverse children.

Creative and Cultural Industries

15. **The Evolution of the Music Industry Since the Rise of Technology and Social Media.**
    Presenter(s): Cole Dunne
    Advisor(s): Dr. Jamie Larkin

The state of the music industry and its evolution over the last twenty years is the main focal point of this project. One can see this evolution in three main ways, firstly through technology and social media, secondly through economics, and lastly through culture. The music industry has been undergoing a period of transformation with the rise of technology and social media, and this has directly affected the economics and culture of the industry. Artists, groups, and labels alike all are facing these hurdles and

navigating through them as best as possible. Many firms expect the music industry to boom over the next decade, with Goldman Sachs predicting a seventy-two billion dollar jump in revenue spread out through the entire industry. This is a significant amount of revenue for the music industry, and analyzing how this transformation has taken place is key to this project. The purpose of this project is to analyze how the music industry works and also to understand how the rise of social media and technology has affected the music industry both economically and culturally. The research will consist of detailed reviews of relevant reports and studies on the music industry and also the analysis of the music industry over the course of the last twenty years.

Data Analytics

16. **The Value of Innovation in Crowdfunding Products**
    Presenter(s): Kyle Blazer
    Advisor(s): Dr. Shahryar Doosti

As crowdsourcing opportunities grow, innovative product designs have greater odds of exposure and success than in traditional Venture Capital (VC) markets. Entrepreneurs and small businesses use crowdfunding platforms to launch products made to fill market niches. Kickstarter, a leading crowdfunding platform, hosts online campaigns where entrepreneurs publish rewards and descriptions to promote their products, solicit funding, and gauge consumer interest. In the past, scholars have used these to gather information on products and their features.
Natural Language Processing (NLP) is the area of computer science concerned with giving computers the ability to understand text, leading to tools such as Chat-GPT. Using modern NLP techniques, we can quantify innovation in crowdsourced products against those available on markets like Amazon. We can then infer innovation's role in the success of crowdfunding projects and test the hypothesis that innovation increases project success. One method used is topic modeling, which discovers latent topics in bodies of text without human input. We have built a topic model to classify 1500+ projects into 25 discrete topics and indicate the words most important to each topic. With these topics in mind, we can leverage Google's state-of-the-art Bidirectional Encoder Representations from Transformers (BERT) algorithm. BERT quantifies the meanings of words by learning contextual relationships within text. We can fine-tune BERT with text from Amazon products and create an "innovation" metric for projects.
Our research advances the literature on language in crowdfunding by using modern NLP methods and one of the most powerful NLP tools to date, BERT. Literature suggests that uniqueness increases product success, but it is possible for products to be too unconventional. Our findings can inform entrepreneurs and established firms alike when communicating product innovation and enhance their success in the market. By providing insight into the value of innovation, we hope to offer practical takeaways for the commercial space.

Electrical Engineering

17. **Implementation of Metasurface Interferometers**
    Presenter(s): Tyler Woo
    Advisor(s): Dr. Nasim Mohammadi Estakhri

In this project we investigate different optimization techniques to design photonic and radio frequency metasurfaces to achieve arbitrary wave splitting (i.e., splitting a single beam into two arbitrary identical beams), and also changing the direction of the outgoing wave. Metasurfaces are thin structures that can be composed of various materials and different surface elements, which allows for creating compact and integrable photonic and radio frequency elements. Here we report multiple dielectric metasurface designs, where the surface successfully modifies the incident beam splitting waves toward +20 degrees and -20 degrees (among other examples). Similarly, our beam deflectors are optimized to change the direction of the +20 and -20 degree incident waves based on the final goal to create the interferometer setup. For the optimization, we used two techniques: Genetic Algorithm Optimization and Topology Optimization to estimate the best parameters/shapes for the metasurface. For topology optimization, we use COMSOL simulations to determine the topology of the surface. The MATLAB Genetic Algorithm Optimization helped find the most efficient metasurface dimensions (few parameters) while the COMSOL topology optimization finds a complex structure with optimal response. In the presentation, we will report these findings as well as a comparison between these different design techniques and their advantages and disadvantages.

18. **Topology Optimization for Integrated Photonics**
    Presenter(s): Sophie Pelton
    Advisor(s): Dr. Nasim Mohammadi Estakhri

Topology optimization is a powerful technique employed in integrated optics to improve the performance of optical components in a system. By utilizing topology optimization, users can optimize a set of parameters in optical components to achieve specific performance criteria. These parameters may include geometric factors or material characteristics. Such optimization softwares solves Maxwell's equations using different methods such as finite difference time domain (FDTD) analysis, and they can simulate light behavior in complex geometries. Commercial softwares and open-source codes are available to perform photonic topology inverse design optimization. The user typically begins by defining a set of performance criteria that the component should meet, such as a minimum level of coupling efficiency or a maximum level of propagation loss. The software then uses an optimization method to modify the shape of the component to achieve these criteria. This can involve adding or removing material from the waveguide, adjusting the position of bends or tapers, or modifying other design aspects. In this work, we focus on the two-dimensional topology optimization of silicon waveguide mode converters (e.g., coupling from mode 1 to mode 2 with 100% efficiency).We establish specific geometric parameters, such as the waveguide width, boundary conditions, and resolution, to optimize the transmission through the waveguide. The focus of my research is on customizing and expanding on an open-source python code to conform it to our applications. As the first step, here we report several successful mode conversion examples. Through this study, we gained valuable insight on the impact of different design parameters in topology optimization

and how to customize the open-source python code to allow for dispersion engineering (next steps of this project). Overall, topology optimization offers a valuable approach to enhancing the performance of optical components, providing users with more precise control over system behavior.

Environmental Science and Policy

19. **The Urgency of Political Polarization Over Climate Change**
    Presenter(s): Mia Truong
    Advisor(s): Dr. Ann Gordon

Despite scientific consensus urging public action in the past few decades, political polarization over climate change has become increasingly disparate, with Republicans and conservatives often skeptical of its threats, while Democrats and Liberals fear its critical risks. Scholars have used the Information-Processing Theory (Woods and Vedlitz, 2007) and the Anti-Reflexivity Thesis (McCright and Dunlap, 2010) to explain the phenomenon of climate change denial, which has continued to grow. This research paper examines the partisan ideologies and characteristics that may influence political polarization over climate change. Using the Chapman Survey of American Fears, a representative national sample of U.S. adults, this study expects to find that association with Republican and Conservative ideologies has a negative relationship with fear of climate change and a positive correlation with Democrats and Liberals. Furthermore, educational attainment and media consumption are expected to have a positive relationship with fear of climate change for Democrats and Liberals and a negative relationship for Republicans and Conservatives. In addition, income is expected to correlate negatively with fear of climate change. Given the urgency to mitigate the irreversible effects of climate change, identifying the factors that contribute to skepticism and shifting political debate toward prioritizing climate change mitigation is critical for the future of humanity.

20. **Integrated Pest Management Efficiency With an Emphasis on Biological Practices in Greenhouses**
    Presenter(s): Kainani Tacazon
    Advisor(s): Dr. Richelle Tanner

Pests are common sources for damage and poor plant health in gardens and ecosystems. An integrated pest management (IPM) system is a broad based approach that typically combines biological and chemical practices to help economically control pest populations. Previous research has developed adequate IPM programs that were deemed successful for pest eradication primarily through the utilization of chemical based pesticides with few changes in garden maintenance techniques. In this current project, we explore the use of predominantly biological practices through changes in greenhouse maintenance and beneficial predator release methods as an alternative to using chemical pesticide. We conducted a series of pest collection and identification processes to test the efficiency of greenhouse cleanliness and predator release as the primary method for pest management. In this experiment, we gathered measurements across tropical greenhouse ecosystems of varying temperatures (intermediate: 75°F, warm: 85°F, and cold: 65°F) and collected data once a week for two months. We used three yellow sticky traps at varying heights (6in., 9in., and 12in.) and locations to quantify the number of pests alongside measuring the temperature and humidity of each greenhouse. The preliminary results indicate that greenhouse maintenance, such as

managing moisture, avoiding accumulation of dust, and pruning, is an adequate process to reduce and eradicate pest populations. Furthermore, the use of chemical pesticides for pest management raises the possibility of chemical immunity and strength within pest populations, thus requiring more intense management strategies including the use of pesticides. This research stresses the need to break away from pesticide dominated techniques but rather emphasize the need to explore and practice natural biological control. As a result, better resilience against pest populations can be created by farmers and gardeners, reducing the need for chemical pesticides or tools.

Film

21. **How the Female Orgasm Gap is Perpetuated By Porn**
    Presenter(s): Bridget McGarry
    Advisor(s): Dr. Ian Barnard

Most porn produced is for male pleasure, which makes it seem to viewers (both male and female) that the female orgasm is easily attainable and can happen within seconds or a couple of minutes of initiating intercourse. In reality, this is only true for a fraction of the female population. For most women, it takes an average of 14 minutes to reach an orgasm. Porn also shows women orgasming from penetration alone, but 81.6% of women cannot orgasm from penetration alone. This misrepresentation of the female orgasm in porn is spilling out into the real world since over 40 million Americans watch porn every year. Both men and women have unrealistic expectations on how to achieve the female orgasm during intercourse due to the inaccurate methods shown in porn.

Health Sciences and Kinesiology

22. **Inter-Rater Reliability of Novice Raters on the MyotonPro and Real-Time Ultrasound After a 2-Hour Training Session.**
    Presenter(s): Anna Pierre, Tasha Kotz
    Advisor(s): Dr. Brent Harper

Tendon injuries are common in sports. Tracking Achilles tendon tissue parameters may help clinicians understand injury mechanisms. The aim of this study was to determine the reliability of two student raters after a 2-hour training for obtaining thickness and stiffness measurements of the Achilles tendon. We hypothesized there will be no difference in reliability between raters in the MyotonPro (MP) Stiffness and the Real Time Ultrasound (RTUS) Thickness measures. Subjects included four healthy adults, 50% female, age 19±1.4 years, height 168.9±7.9 cm, weight 55.6±4.3 kg. This was a laboratory-based study of convenience. All participants had both Achilles tendons assessed measuring for stiffness (N/s) and a thickness (mm). A paired-sample t-test was performed to see if there is a difference in MP Stiffness and RTUS Thickness measures between raters. There was no difference identified between raters for Stiffness (N/s), $t(7)=0.185$, $p=0.86$ as rater 1 had a mean±SD of 1069.3±101.8 and Rater 2 had a mean±SD of 1064.7±77.4. There was no difference identified between raters for Thickness (mm), $t(7)=1.776$, $p=0.12$ as rater 1 had a mean±SD of 5.48±0.64 and Rater 2 had a mean±SD of 5.15±0.71. Intraclass correlation

coefficient (ICC2,1) agreement between raters for MP Stiffness was 0.72, demonstrating moderate agreement, F(7,1)=5.45, p=.019, CI95[1020.5, 1113.6]. ICC2, agreement between raters for RTUS Thickness was 0.65, demonstrating moderate agreement, F(7,1)=5.78, p=.017, CI95[4.95, 5.67]. Bland-Altman plots indicated the raters were equivalent.
A 2-hour training may be appropriate to obtain reliable Achilles tendon assessment regarding Stiffness (MP) and Thickness (RTUS) measurements from novice raters. Future research is required with more participants to really assess reliability of these measures between novice raters and when compared to a licensed professional are needed. Furthermore, construct validity on subjects with Achilles tendon injuries is required.

23. **Dysfunctional Breathing Pattern's Effect on Movement Performance Between Sexes**
    Presenter(s): Anna Pierre
    Advisor(s): Dr. Brent Harper

Fundamental movement patterns such as the Functional Movement Screen (FMS), the Selective Functional Movement Assessment (SFMA), and the lower quarter Y-balance (LQ-YBT) assess movement competency, dysfunctions, and performance and are proposed predicters for injury risk. The purpose of our study was to explore associations between sexes, dysfunctional breathing, and these three-movement metrics. 79 healthy adults, mean (± standard deviation), 49.4% female (n=39) age 24.41 (2.04) and 50.6% male (n=40) age 24.96 (2.09). Laboratory based, cross-sectional study of convenience. Participants completed the LQ-YBT, the FMS, the SFMA, and the Breath Hold Test (BHT). Higher scores indicate better performance for LQ-YBT, FMS, and BHT, while a lower SFMA score is better. Normality was violated (Shapiro-Wilk). Spearman's rho correlation showed: a significant, small, positive relationship between BHT and FMS (rs= .269, p= .016); a significant, medium, negative relationship between SFMA and FMS (rs= -.562, p= <.001); a significant, medium, positive relationship between FMS and LQ-YBT right (rs= .359, p= .001) and left (rs= .419, p= <.001); a significant, medium, negative relationship between SFMA and LQ-YBT right (rs= -.328, p= .003) and left (rs= -.375, p= <.001); a significant, small, positive relationship between Sex and BHT (rs= .228, p= .044). A Mann-Whitney U identified significant differences between Sexes for BHT (U = 575.0, p= .045) and SFMA (U= 572.0, p= .041). BHT mean scores were lower for females (M=27.58, SD=7.96) than males (M=32.17, SD=11.48). SFMA mean scores were lower for females (M=9.00, SD=8.88) than males (M=10.35, SD=5.63). Lower BHT scores influence movement competency (FMS) and better movement quality (lower SFMA) results in better overall movement (higher FMS). Individuals scoring higher on dynamic balance testing (LQ-YBT), have better fundamental movement competency (higher FMS and lower SFMA scores). Females demonstrated better complex functional movement (lower SFMA) despite exhibiting less optimal breathing pattens (lower BHT scores).

24. **The Relationship Between Ligament Thickness and Stiffness, and Dynamic Balance in Those With Chronic Ankle Sprain**
    Presenter(s): Tasha Kotz
    Advisor(s): Dr. Brent Harper

Fundamental movement patterns such as the Functional Movement Screen (FMS), the Selective Functional Movement Assessment (SFMA), and the lower quarter Y-balance (LQ-YBT) assess movement

competency, dysfunctions, and performance and are proposed predicters for injury risk. The purpose of our study was to explore associations between sexes, dysfunctional breathing, and these three-movement metrics. 79 healthy adults, mean (± standard deviation), 49.4% female (n=39) age 24.41 (2.04) and 50.6% male (n=40) age 24.96 (2.09). Laboratory based, cross-sectional study of convenience. Participants completed the LQ-YBT, the FMS, the SFMA, and the Breath Hold Test (BHT). Higher scores indicate better performance for LQ-YBT, FMS, and BHT, while a lower SFMA score is better. Normality was violated (Shapiro-Wilk). Spearman's rho correlation showed: a significant, small, positive relationship between BHT and FMS (rs= .269, p= .016); a significant, medium, negative relationship between SFMA and FMS (rs= -.562, p= <.001); a significant, medium, positive relationship between FMS and LQ-YBT right (rs= .359, p= .001) and left (rs= .419, p= <.001); a significant, medium, negative relationship between SFMA and LQ-YBT right (rs= -.328, p= .003) and left (rs= -.375, p= <.001); a significant, small, positive relationship between Sex and BHT (rs= .228, p= .044). A Mann-Whitney U identified significant differences between Sexes for BHT (U = 575.0, p= .045) and SFMA (U= 572.0, p= .041). BHT mean scores were lower for females (M=27.58, SD=7.96) than males (M=32.17, SD=11.48). SFMA mean scores were lower for females (M=9.00, SD=8.88) than males (M=10.35, SD=5.63). Lower BHT scores influence movement competency (FMS) and better movement quality (lower SFMA) results in better overall movement (higher FMS). Individuals scoring higher on dynamic balance testing (LQ-YBT), have better fundamental movement competency (higher FMS and lower SFMA scores). Females demonstrated better complex functional movement (lower SFMA) despite exhibiting less optimal breathing pattens (lower BHT scores).

25. **Mindfulness Meditation as a Complementary Therapy for Chronic Migraines**
    Presenter(s): Isaac Min
    Advisor(s): Dr. Manjari Murali

Migraines are a common and genetically influenced disorder generally characterized by intermittent episodes of headaches ranging from moderate to severe. These headaches are often associated with symptoms such as nausea, hyperacusis, and photophobia (Ruschel and Jesus, 2022). Studies have demonstrated that over 1 billion individuals worldwide experience migraines, and it is the most common neurologic disorder (Amiri et al., 2022). Current treatment and therapies for migraines range from the use of analgesics, triptans, antiemetics, and calcitonin gene related (CGRP) peptides. Neuromodulation techniques are available for patients who do not respond to drug interventions (Schwedt and Garza, 2022). Mindfulness, a practice that directs one's attention to the present moment, has grown in popularity and is being more frequently used in academic medical centers and hospitals. Studies have demonstrated promising results for treating psychological conditions such as ADHD and emotion regulation (Keng et al., 2011). However, a relatively limited number of studies examine the effects of mindfulness techniques on migraines. A meta-analysis found that mindfulness meditation had a statistically significant effect on reducing the frequency, duration, and severity of migraine attacks (Gu et al., 2018). Results of these research studies suggest that mindfulness meditation may be an effective complementary therapy for chronic migraines.
To promote the benefits of mindfulness, my research partner and I will conduct a workshop this April for Chapman undergraduate students at the Crean College of Health and Behavioral Sciences. It will provide an overview of mindfulness, its potential benefits for overall health, and mindfulness techniques that students can incorporate into their daily lives.

26. **Mindfulness Meditation, Bipolar Disorder and Structural Brain Abnormalities**
    Presenter(s): Sabina Hernandez
    Advisor(s): Dr. Manjari Murali

Mindfulness meditation has vast benefits, including increasing emotional regulation and improving psychosocial functioning, which are commonly impaired in individuals with Bipolar Disorder. Individuals with Bipolar Disorder experience severe mood fluctuations of mania and depression. These symptoms of mania and depression have been linked to structural brain abnormalities. What is missing in the scientific literature is research on the effects of mindfulness meditation on these structural brain abnormalities that occur with Bipolar Disorder. In the present systematic review, I will discuss several studies on brain structural deficits associated with bipolar disorder, and other studies where mindfulness practice caused enhancements in certain brain structures. Through this comparative analysis, I will argue that mindfulness meditation could serve as an adjuvant therapy in patients with bipolar therapy. Individuals with Bipolar Disorder show increased cortical thinning and significant hippocampal abnormalities (Abé et. al. 2022, Cao et. al. 2017). In the same brain structures that are altered in Bipolar Disorder, researchers have observed an increase in neuron density in people who practice mindfulness meditation. Specifically, mindfulness meditation practice increases cortical thickness and gray matter density in the prefrontal cortex and hippocampus (Lazar et. al. 2005, Holzel et. al. 2011). Additionally, as part of my research, I completed an evidence-based 4-week Koru Mindfulness course. In this course, I learned about mindfulness meditation, and how it can be utilized as a tool to manage stress and anxiety. My research partner and I are conducting a mindfulness workshop for the campus community this April to spread awareness about the health benefits of this practice. During the workshop, we will guide participants through some mindfulness meditation techniques, talk about the research on mindfulness, and have small group discussions on how college students can benefit from mindfulness. I will also present the outcomes of this workshop during the symposium.

History

27. **The Effects of Trauma Among Holocaust Survivors After the War**
    Presenter(s): Natalie Braker
    Advisor(s): Dr. Jeffrey Koerber

This paper will examine the effects of trauma among Holocaust survivors after the war, including Post-Traumatic Stress Syndrome (PTSD), triggers, nightmares, and anxiety. It will review clinical research by comparing it to the range of experiences of Holocaust survivors as described in videotaped interviews during the late 1980s and early 1990s. Upon reviewing existing literature, it becomes clear that PTSD is life-long for Holocaust survivors. PTSD is a mental health condition triggered by either experiencing or witnessing a terrifying event or a series of events. There are four general types of PTSD symptoms: intrusive memories, avoidance, negative changes in thinking and mood, and changes in physical and emotional reactions. People with PTSD may avoid situations that remind them of the traumatic event, as is the case with Trude Plack, who describes her aversion to flags. She told an interviewer in the 1990s how she once saw a line of flags posted every six feet, causing her to tell her husband that she “couldn’t stay here” and needed to leave. Her need to avoid flags was triggered by witnessing Nazi flags during the

Holocaust. According to Trude, her strong reaction to flags has left an irrevocable impression on her. This "irrevocable impression" is a common experience of Holocaust survivors, in which extreme stress in childhood and young adulthood endured from the Holocaust is life-long. Ultimately, symptoms of PTSD in Holocaust survivors have been recognized even more than seventy years after the Holocaust.

Honors

28. The Effect of Mass Consumerism on Pornography and Art.
Presenter(s): Madigan Hunt
Advisor(s): Dr. Ian Barnard

"Sex sells" has been a massive consumer theory that has driven media to classify sexual content as simply money-driven, mass produced, artless cash grabs. Pornography has been described as "one-dimensional media sans artistic merit" by the Supreme Court — however, the sex work industry and feminist film theorists disagree. This research project will be looking at feminist theory, queer theory, and artistic film theory to try and examine the gray area between the categories and prove that both are not mutually exclusive. Is pornography anti-feminist? Is there artistic merit to sexually explicit content? Is pin-up art pornography? Using theoretical threads, this research presentation will attempt to flesh out these gray areas and prove that categories are not simply threads to separate.

Physical Therapy

29. Comparing Motor and Non-Motor Digital Biomarkers Among Healthy Older Adult and Person with Parkinson's Disease
Presenter(s): Mira Ananthanarayanan, Emily Henson
Advisor(s): Dr. Rahul Soangra, Michael Shiraishi

Parkinson's Disease (PD) affects approximately 500,000 older adults in the US and researchers are investigating critical digital biomarkers which can be predictive of PD. Gait offers important digital biomarkers and gait initiation has been already reported as a critical component affected in a participant with PD. Similarly, postural control has been reported by some as an important digital biomarker and is affected by the disease as well. Camera-based motion capture systems are widely used to investigate gait and posture. The infra-red markers on the participant's body and ground-embedded force plates make it easier to observe differences in gait and posture. Non-motor digital biomarkers such as speech are reported to be affected in PD. The frequency and pitch of a Parkinson's patient are drastically lower than a control participant. Thus, Mel-frequency cepstrum (MFC) can be used to differentiate the voice data and frequency spectrograms can be observed. Frequency spectrograms represent the magnitude range of frequency that makes up the signal collected. MFCCs are coefficients that, together, comprise MFC. This study will use motion capture data to compare the gait between healthy and PD participants. Researchers prompted participants to walk at their own normal speed for 60 seconds. Researchers then prompted participants to say "AH" for as long as possible in a single breath, then repeated "PUH," then "TUH," and "KUH '' as many times as possible in one breath. Researchers recorded these sounds and compared them

using a spectrogram between healthy and Parkinson's participants. This is an ongoing study and we plan to collect data from 40 more participants.

Political Science

30. **Secular Politics in 2023**
    Presenter(s): Gabriel Ramos
    Advisor(s): Dr. Ann Gordon

Relationships between church and state have been debated throughout history in efforts to both promote and diminish the presence of faith in our political culture. In this article I will be using data from the National Election Studies to examine the extent of which religious beliefs manifest itself in political life. Certain phenomenon such as the "All-Lives Matter Movement" are rooted in religious beliefs and have led to events such as the overruling of Roe v. Wade. Examples include the debate of gay marriage and the new drag ban laws such as in Tennessee and elsewhere which are aiming to "eradicate transgenderism" from public life, rooted in an outdated religious prejudice against homosexuality. Secular politics become most important when such beliefs begin to harm and marginalize groups of people. This is a complex issue, but it seems obvious that often claims to political morality are rooted in faith, and are attempts to manifest one set of sectarian religious beliefs into legislation and public policy. Research suggests that certain religious beliefs are a catalyst for political participation. Religiosity, the quality of one's belief has been studied in a number of surveys to determine whether it has an impact on an individual's drive to participate in politics. However, religiosity across a variety of denominations has demonstrated a negative correlation with political engagement suggesting a sense of general lack of dissatisfaction with society and politics. What has been discovered, is that there are certain religious beliefs often on issues of moral virtue, which creates an incentive to participate in politics, both conventionally and unconventionally. These beliefs often can be correlated to evangelical Christian virtues, leading me to search for a connection between those who hold to evangelical Christian virtues and how they seek to influence in politics in both conventional and unconventional ways.

31. **The Impact of News Media on Changing Racial Demographics in the United States**
    Presenter(s): Luke Patterson
    Advisor(s): Dr. Ann Gordon

With the evolution of American demographics into a more ethnically and culturally diverse country, it is believed by many that the once-white majority of the country will no longer be the case. On the other hand, with rising political polarization among everyday Americans, an apparent diaspora in the news programming people consume can directly affect their emotions that lead to political action. Programs such as Fox News have capitalized on these new emerging demographic shifts by discussing the future of race relations on their channels, reinforcing a negative view of a demographically different society in the future. I believe that by examining the relationship viewers have with their preferred source of news and current events through questionnaire surveys and their level of fear of whites no longer being the majority race within the country, an understanding of news stations and their impact on everyday Americans can be accurately assessed. Through this research, a clear association between the specific brand of news

media consumed can be directly associated with the level of fear viewers have of changing racial demographics within the country. From this research, we can accurately attribute different news companies' levels of fear-mongering and agenda-setting that can be used to inform viewers and hold the various companies accountable.

32. **The Effects of Racial Resentment, Racial Empathy, and Racial Sympathy on Death Penalty Opinions in the United States**
    Presenter(s): Alyssa Castanon
    Advisor(s): Dr. David Shafie

Capital punishment has become an increasingly polarizing issue due to concerns that certain racial groups are unfairly executed, such as Blacks and Latinos. While most Americas support the usage of capital punishment, breaking the population into sub-groups reveals that different racial groups support the practice at vastly different rates. In this paper, I will examine the relationship between public opinion in differing racial groups and support for the death penalty, particularly in terms of racial resentment, which has shown that animosity towards racial groups can cause individuals to encourage harm towards that group. I will also examine racial empathy and sympathy which has been shown to encourage voters to vote in the interests of other racial groups. Using the American National Election Survey dataset, which gathers information about beliefs and attitudes that influence American voting behaviors, I expect to find that the presence of racial resentment is likely to increase support for the death penalty in all races that have animosity towards Blacks and Latinos, as those groups are disproportionately affected by the death penalty. The presence of racial empathy and sympathy will cause opposition to the death penalty because those who can connect with individuals facing execution are less likely to support capital punishment due to the harm that it causes. However, those with higher levels of racial resentment towards Blacks and Latinos than levels of racial empathy for those groups, will feel more compelled to support capital punishment. This research will provide insight on American society to better understand how racial relations influence the formation of public opinion.

33. **The House of Representatives: How Representative are They With Respect to Environmental Public Opinion?**
    Presenter(s): Cole Barlow
    Advisor(s): Dr. David Shafie

The present study examines the voting habits of elected officials on climate policy in the United States. Looking at congressional votes and congressional district sentiment on climate change to see the difference between how closely constituents are represented. By first analyzing different theories of representation, public opinion, and environmental policy it becomes evident what comes into creating positive change. I combined 2021 survey data from Yales Climate Opinion Maps and the 2022 League of Conservation Voters in the National Environmental Scorecard into a unique dataset for this study. The goal is to first see if members of congress are voting along with the opinions held by their constituents. Two hypotheses will be presented. First, Democratic congressmen will be more closely aligned with their voters compared to Republican congressmen, and second, more congressmen will be voting against the interest of their constituents rather than with them. If elected officials in the United States are not properly

representing the beliefs of the citizens that vote them into their positions our government is not working as it was meant to. Furthermore, it will delay much-needed environmental policy to mitigate the effects of climate change.

34. **The Electoral College: The Effectiveness of our Presidential Elections**
    Presenter(s): Kyle Tanimura
    Advisor(s): Dr. David Shafie

The Electoral College is a voting process that elects the President and Vice President of the United States. This voting system uses a selected group of electors to elect the president instead of a direct popular vote. This system relies on the outcome of the popular vote in the state election to determine who the electors will cast their ballot for. To become the next President of the United States, a candidate must receive 270 votes from the electoral college.
This has been a topic of much debate and has been questioned for its effectiveness in accurately representing the opinion of voters regarding who should be the President of the United States. Furthermore, competitive states, also referred to as “swing” and “battleground” states, are perceived to have greater significance to the success of a presidential candidate.
This study examines the electoral college's impact on presidential campaigns and the outcome of presidential elections. By using the voter turnout data from the 2020 National Election Study, this research seeks to understand further the relationship between the competitiveness of an election within a state and voter turnout believing that competitive states (swing and battleground) will have higher voter turnout in comparison to states with less competition as well as voters from competitive states will more than likely to report being contacted by a campaign.
By understanding the relationship between the Electoral College and voter turnout, we hope to contribute to the ongoing conversation about the effectiveness of elections in the United States to elect the President and Vice-President.

35. **Are Federal Workplace Environments Still Toxic?: A Sex Discrimination Analysis**
    Presenter(s): Sophie Imondi
    Advisor(s): Dr. David Shafie

Treating someone with prejudice based on sex or identification otherwise a definition of sex discrimination. Harassment occurs in many environments including, households, school campuses, the workplace, and more. Enduring any harassment and discrimination of any kind tend to be followed by mental health issues. As societies we have imposed Title Ⅶ and Don’t Ask Don’t Tell in order to make progress as societies, but what is the gravity of the effect? After decades of these changes, we can analyze the difference between environments within the federal workplace over time. In order to conduct an in-depth analysis, the population for the study was limited to United States federal employees and an emphasis on military branches. This study will examine the rates of sex discrimination between civilian and military personnel with the use of reports by the U.S. Merit Systems Protection Board on sexual harassment in the Federal Workplace. This analysis was made in order to uncover if there have been progressional changes in areas of the United States federal workspace regarding the relationship between sex and identification with forms of harassment.

36. **Regional Variation Among Latino-American Political Opinion**
    Presenter(s): Victor Leon
    Advisor(s): Dr. David Shafie

As of 2020, Latino and Hispanic Americans constitute 19.5% of the entire U.S. population, making them the biggest racial minority group in the country and making their contribution to American politics increasingly more important. The growth of Latino and Hispanic Americans in the United States has also led to diversification in this community of people from different national origins as well as a spread of Latino Americans into different regions of the country. Subsequently, voting behaviors and political beliefs among Latinos have aligned with the country's regional electoral realignments. Issues on which the Latino community should be perceived to have unified group-identity support, such as immigration and cultural assimilation, are divisive. Latino views on these issues have tended to align with their region's reigning political ideology. Using data from the 2018 National Survey of Latinos (NSL) from the Pew Research Center, this research paper will examine this regional variation to determine what influences it. Specifically, I will examine two variables: national origin and racial identity. Voting trends throughout United States history have demonstrated that Latino Americans tend to be an important constituency for the Democratic Party, sparking a perception of a group-conscious support for liberal political policies and ideals. Recent trends have shown growing Latino American support for the Republican Party. With the growing rate of Latino Americans in the United States and their ever-growing importance and participation in our country's politics, it is important to fully understand what drives their political behavior. This research paper and its findings hope to contribute to the idea that the Latino-American community should begin to be viewed as a diverse voting base and not a monolithic voting bloc.

37. **Digital Butterfly Battleground: The Transgender Community and Social Media**
    Presenter(s): Zoe Bell
    Advisor(s): Dr. David Shafie

For several decades now, the LGBTQ+ community has generally been seeing increasing levels of acceptance among the general public; however, one community of people under that umbrella, the transgender community, has been struggling to achieve the same acceptance, and has even faced increasing opposition and scrutiny in recent years. This shift in the public conversation around transgender people has coincided with another shift, one from traditional forms of media, like newspapers and cable television, to the internet-based social media, giving rise to the spreading of news through places like Facebook or Instagram. For this study I will be attempting to examine the interactions between transgender people and social media, and the ways in which different platforms interact with, perceive, and support transgender people, and whether or not different social media platforms might have overall leanings in regards to their opinions on the community distinct from traditional forms of media. To do this, I will be using data from the American National Election Studies' 2020 Social Media study (which compiles the aggregated answers of over 5,700 respondents) along with supporting data from their 2020 Time Series Study, to compare the professed opinions of trans people across different social media platforms, as well as contrasting the results against traditional media. For this study, I will be focusing on Instagram, Snapchat, Facebook and Twitter, as these are the most long-term established social media platforms that have been the most strongly entrenched in the internet for several years. Additionally, I will examine the relationships between

other demographic variables, namely age and gender, and compare them against both social media use and opinion of the transgender community in an attempt to determine whether or not these variables may have an additional effect on the differences between social and traditional media platform leanings.

38. **The Impact of Political Efficacy on Group Consciousness**
    Presenter(s): Lilly Anderson
    Advisor(s): Dr. Crystal Murphy, Dr. Angelica Allen, Dr. David Shafie

In a representative democracy, there can be a conflict between citizens' trust towards government effectiveness which can have numerous impacts on group consciousness. The relationship between government and citizens is paramount in the United States, as active political participation makes up the nation's political institutions. Public opinion, however, plays a pivotal role in the government's interests. Using data from the American National Election Studies, I want to investigate how political efficacy varies group consciousness regarding different ethnic groups. My independent variable, political consciousness, alongside the dependent variable of political efficacy, leaves my controlled variable as a political party. I hypothesize that mistrust in government can not be attributed to one singular factor. Still, instead, distrust can be built due to the election process, hyperpolarization, social movements, racial division, or public perception of particular individual leaders.

Psychology

39. **Am I Staying Active? Analyzing Daily Activity and Health Trends**
    Presenter(s): Analisa Vavoso
    Advisor(s): Dr. Oliver Lopez

I am analyzing my own data on habits such as sleep and activity. Some data that I am measuring is on calories burned, steps, distance walked, sedentary minutes, and sleep quality markers such as minutes of deep sleep, awakenings, and sleep debt. I have been collecting this data since February 9, 2023, and will continue to do so until April 8, 2023. My method of collecting data is wearing a Fitbit tracker daily. My goal is to uncover any possible patters relating to my daily habits as a way to learn about myself and improve my habits in the most efficient way. Additionally, I want to expand my knowledge of analyzing data and apply it in a psychological context. My aim is to examine if there is any correlation between activity and sleep. As a psychology student, I have learned a lot about the importance of sleep and activity, and I want to know how this shows up in my own life. I hope to contribute more research on health and habit trends. I expect to find that improving sleep time will improve other areas of my habits, and that getting more activity during the day will help my sleep habits.

Art

1. **To Find Joy in Our Birthing**
   Presenter(s): Kennedy Cardenas
   Advisor(s): Lia Halloran

This exhibition, To Find Joy in Our Birthing, created thanks to the undergraduate scholarly creative grant program, is an installation resembling a domestic living space. This is a space positioned “post-revolution” in an imagined society that is structured around blackness instead of whiteness. The work nods to such creative genres as afro-futurism and afro-surrealism, while highlighting black histories that have been systematically omitted from western culture. From the magazines to the sofa to the paintings on the walls, this space is representative of what life could look like were it built around the African diaspora. This installation consists of six primary pieces and a medley of found objects and smaller pieces that make up the space. The larger more prominent pieces in this installation include three 18” x 24” paintings, a dress, a quilt, and a broken tv. The three paintings cover such topics as early African American cowboys, Black Wall street, and early drag in Harlem. These paintings shed light on black histories that are not well known due to the white bias in how American history is often told. The dress piece references Baby Esther, the girl whose musical style was stolen to create the better known cartoon character, Betty Boop, who has been sexualized and whitewashed for mainstream media. The quilt nods to the history of African American quilters and how they were said to be used to help enslaved people seek freedom through the use of symbolism. Lastly the broken tv references Gil Scott Heron’s “the revolution will not be televised”. Beyond these main pieces, there are many other details that aid in creating the space. No aspect of this installation is unintentional as all elements, big or small, add to the feeling of this being a safe space by and for blackness. The aim of this project is to carve out a space often denied to black people and to reclaim agency as to how black stories are told.

Biochemistry and Molecular Biology

2. **Haploidentical Stem Cell Transplant Using Post Transplant Cyclophosphamide for Pediatric Hematological Malignancies**
   Presenter(s): Leia Reddy
   Advisor(s): Dr. Marco Bisoffi

A Children's Hospital of Orange County (CHOC) institution retrospective study was done on ten years of data to measure the overall survival (OS), disease-free survival (DFS), and graft-versus host disease (GVHD)-free relapse-free survival (GRFS) across allogenic stem cell transplants. The types of transplants in this study were haploidentical stem cell transplant (HSCT), matched unrelated donors (MUD-HSCT), and matched related donors (MRD-HSCT). Data was collected from all transplants that occurred between June 2010 and June 2020, with 105 patients in total, of those 42 received transplants from haploidentical donors, 34 from MRD, and 29 were MUD. Patients that received transplants were diagnosed with the following hematological malignancies – Acute Lymphocytic Leukemia (ALL) (n = 58); Acute Myeloid

Leukemia (AML)/Myelodysplastic Syndromes(MDS)/Chronic Myeloid Leukemia(CML) (n = 40), Mixed Phenotype Acute Leukemia (MPAL) (n=2) and lymphomas (n=5). Results from the study suggested the potential of haplo-HSCT as a curative treatment for high-risk hematological malignancies with comparable results to MRD-HSCT and potentially better outcomes than MUD-HSCT.

3. **Purification and Characterization of Black Seeds (Nigella sativa) Proteins by Edman Sequencing and Mass Spectrometry**
   Presenter(s): Kadambari Ayithi
   Advisor(s): Dr. Aftab Ahmed, Basir Syed

According to the CDC, cancer deaths in the United States dropped 27% in the past 21 years, but still, it is the second leading cause of death. In traditional folk medicine, compounds extracted from various plant components such as fruit, seeds, leaves, flowers, etc., play a crucial role in treating several ailments, including cancer. Therefore, there is a constant interest in developing more effective, targeted, and cost-effective anticancer drugs. Medicinal plants are an enormously rich source of biologically active peptides and proteins. Nigella sativa, a miraculous medicinal herb commonly known as black seed or Kalonji, belongs to the plant family Ranunculaceae. Our group has previously reported the anticancer activity of proteins extracted from its seeds against the MCF7 breast cancer cell line. The present study focuses on applying two-dimensional liquid chromatography for protein purification and employing automated Edman sequencing techniques for the primary structure elucidation of purified proteins. We also used Q-TOF LC/MS/MS, and De Novo protein sequencing bioinformatics tools to evaluate the Black seeds proteome. The proteins were extracted in PBS precipitated in 80% ammonium sulfate. The HiTrap Heparin column was employed to enrich the heparin-binding proteins/peptides from the crude extract and were further purified by the second-dimensional RP-HPLC. The identity of several proteins was established by complementary techniques, including N-terminal amino acid sequencing and mass spectrometry. Our preliminary findings based on the homology search identified several biologically active proteins, including non-specific Lipid Transfer Protein (ns-LTP), Defensin, and Nigellin-1 proteins. Further, the differential mass spectrometric analysis of tryptic digest of heparin bound and unbound fractions revealed exciting information on black seeds proteome. Work is in progress on determining the complete primary structure of these and other biologically active proteins from the black seeds for their anticancer potentials.

Chemistry

4. **Carbonyl Hydroboration and Cyanosilylation Catalyzed by Group 14 Metallocenes**
   Presenter(s): Haley Robertson
   Advisor(s): Dr. Allegra Liberman-Martin

For various industries, catalysts are used to improve the efficiency of a reaction. It is essential nowadays to find catalysts that are inexpensive, safe, and earth-abundant. Traditionally, precious metals were used as the primary catalytic component, but this project uses main group elements instead. We have synthesized six catalysts made of germanium(II), tin(II), and lead (II) metallocenes and compared them in

carbonyl hydroboration and cyanosilylation reactions. Stoichiometric reactions were also performed to test the reactivity of each catalyst.

5. **Adsorption of Manganese Onto Goethite and Goethite-Coated Sand-Effects With Sodium Chloride in Simulating Oceanic Salinity**
   Presenter(s): Thao Vy Le
   Advisor(s): Dr. Christopher Kim, Dr. Miranda Aiken

Iron oxides, a strong environmental oxidant, are naturally found in sand and soil and can form reactive surface coatings on mineral surfaces. The highly reactive surface can sequester trace metal contaminants found in aqueous systems from sources such as volcanic eruptions, weathering, and anthropogenic activity. The dissolution of Mn oxides contributes to the increase of trace metal contaminants in water sources and negatively impacts human health and the ecosystem. Therefore, it becomes highly interesting to investigate the chemical properties of iron oxide coatings to predict aqueous Mn adsorption and Mn oxide precipitation behavior in environmentally relevant conditions such as salinity. Despite existing studies on different aqueous conditions, the effect of saline environments on manganese adsorption onto iron oxides is unknown. This work presents a novel procedure based on work by Schwetmann and Cornell towards the solid synthesis of goethite, commonly occurring iron oxide, and goethite-coated sand. The absorption experiments were done in both oxic and anoxic environments to determine the amount of Mn uptake by iron oxide surfaces and differentiate between precipitation and sorption occurrences. To simulate a saline environment, the concentrations of NaCl were adjusted, ranging from 0.0 to 1.0M. Current results show that the amount of Mn (II) uptake by goethite correlates with the concentration of NaCl in the oxic aqueous solution, indicating that saline environments promote Mn(II) uptake. At 1.0M NaCl, beyond seawater salinity, Mn uptake reaches its peak at about 61%, while at freshwater salt content, only 15% of Mn uptake is observed, that saline condition is more ideal for Mn(II) removal compared to a freshwater environment. Under the anoxic condition, the removal of dissolved Mn(II) appeared lower than in oxic conditions, reaching about 53% peak at 1.0M NaCl, suggesting that under oxic conditions, precipitation had occurred, which caused the higher percentage of Mn removal under the oxic condition.

6. **Effect of Sulfate Concentrations on the Adsorption of Heavy Metal Ions Onto Goethite Surfaces**
   Presenter(s): Sarah Connolly
   Advisor(s): Dr. Christopher Kim

Due to countless industrial processes constantly occurring throughout the environment, heavy metal concentrations continue to contaminate wastewater with the potential to affect human health and surrounding environments. Trace metals are commonly found in mine waste runoff and can potentially expose local communities to toxic amounts of metal. Among these metals, copper and zinc have been shown to negatively affect human health through cancer, hyperkeratosis, hypertension, melanosis, lung diseases, and peripheral vascular diseases. A potential remediator to clean these effected wastewaters is to use nanomaterials for heavy metal ions to adsorb onto the particles' surface and then be removed from the water via desorption. In the following experiment, copper and zinc ions were tested for their adsorption onto the surface of goethite nanoparticles under different sulfate concentrations. Sulfate

enhanced copper and zinc adsorption and retention with these iron oxyhydroxide nanoparticle surfaces. Further research is required to determine the optimal remediation technique to remove these harmful heavy metals from surrounding wastewaters. In the future, we hope goethite nanoparticles will be implemented into environmental remediation efforts to clean effected wastewaters throughout the state of California and onward.

7. **Metal Ion Effects on Sulfur(VI)-Fluoride Exchange Mediated by Group II Salts**
   Presenter(s): Natalie Saadeh
   Advisor(s): Dr. Maduka Ogba

Group II salts bound to weakly coordinating counterions, such as bistriflimide, have
recently gained attention as Lewis acid catalysts in chemical reactions. These salts are particularly attractive because they are cheap, abundant, and non-toxic alternatives to transition metal catalysts typically used in modern organic synthesis. Catalyst scope data across several reports using these group II salts reveal reactivity differences when different group II metal ions are used; a deep understanding of metal ion effects on catalysis would foster efficient reaction design. To that end, we use a case study from recent experiments showing that calcium bistriflimide was effective in activating sulfur(VI) fluorides toward nitrogen-containing sulfur(VI) compounds via sulfur(VI)-fluoride exchange (SuFEx). In this work, significantly reduced yields were observed when magnesium bistriflimide was employed. Density functional theory (DFT) methods were used to compute and compare the SuFEx mechanism mediated by magnesium bistriflimide to that of calcium bistriflimide. Structural, energetic, and electronic properties of the activated species were analyzed to reveal the origins of the metal ion-induced differences in SuFEx reactivity mediated by group II Lewis acidic salts.

8. **Calcium vs. Zinc: Which Metal Lewis Acid is a Better Activator of Sulfur(VI)-Fluoride Bonds?**
   Presenter(s): Paul Rosa
   Advisor(s): Dr. Maduka Ogba

Our research group is using computational techniques to investigate how Lewis acidic salts activate sulfur(VI) fluorides. The product of the reaction of study are sulfonamides, which are prominent functional groups in many FDA-approved pharmaceuticals. In our previous report, we revealed at the molecular level, how calcium salts disrupt the sulfur(VI) fluorine bond in the reaction, thus allowing for sulfonamide formation. We hypothesized that the reaction is energetically feasible because the calcium ion forms strong bonds to the departing fluoride from the substrate. However, questions remain about whether calcium is particularly privileged in facilitating sulfur(VI) fluoride activation, or whether other +2 oxidation state metals, such as zinc, may have comparative reactivity. To answer this question, we will use computational techniques to generate a reaction coordinate diagram for the sulfur(VI) fluoride activation reaction mediated by the zinc salt, and compute the fluoride ion affinity of the zinc salt. These data will be compared to the previously reported calcium system and will provide us with insight into how altering the metal ion affect sulfur(VI) fluoride activation reactivity. The underlying hypothesis and preliminary data will be presented in this poster.

Creative and Cultural Industries

9. **Living in the Digital Dimension: An Autoethnographic Approach to Assessing our Technologically Mediated Lives through Museum Spaces**
   Presenter(s): Rebecca Day
   Advisor(s): Dr. Jamie Larkin

Whether we like it or not, each of us is living in a digitally mediated society, where our phones and other technologies are almost an extension of the self rather than a separate entity. We carry our phones with us wherever we go, and the idea of losing them and the memories they may hold is a terrifying thought. Due to this attachment and dependence on technology, it is becoming more and more difficult to pull our attention from our devices and focus on our current surroundings. Whether it be in class lectures, Zoom meetings, or even in museum spaces, we constantly find ourselves reaching for our phones as a distraction. What I seek to uncover from this research project is how members of the younger generation respond to a thought-provoking environment without access to technology. Does this disconnection recultivate their attention and encourage them to be more creative and divergent thinkers? Or does it have the opposite effect and cause frustration and a longing for technology as they will not have the ability to capture and store their experience on their devices? The spaces I have selected to conduct my research in are the Orange County Museum of Art and the Laguna Art Museum. Depending on the participant's responses, I will be able to determine the severity of our attachment to our devices and if spaces like museums could be a possible antidote to our digitally mediated lifestyles.

Data Analytics

10. **It's Music to My Ears! Tracking Top Songs on Spotify**
    Presenter(s): Charles Hsieh
    Advisor(s): Dr. Oliver Lopez

For this particular data project, I decided to track the Top 5 charted songs on Spotify every single day from the beginning of second semester–Spring 2023. Various aspects of each song were recorded and kept on an Excel sheet. These various aspects include tempo, song length, use of synthesizer, whether the guitar was present within the first 10 seconds of the song, and more. This would present us with a more clear picture of the demographic of Spotify and would also highlight the similarities and differences between the most listened to songs. Learning more about how certain types of songs or genres of music make their way to the highest standings, or in other words the more “mainstream” side of society, provides a window into how the psyche of a large portion of our music-listening population functions and tracking this particular data helps to establish, at the very least, a baseline of that understanding. What was and is expected in the outcome of this project is that the Top 5 charted songs on Spotify will have a similar combination of instrument use, lyrical premise, and music theory (time signature, key signature, genre, etc.). Any outliers would include remixed music (particularly by any musical artist that has gained more popularity and traction within the last few years) and very recent, newly-released songs by musical artists

that already had much popularity prior to this data project – that latter outlier is mostly in terms of a top charted song that doesn't fit the expected conclusion.

11. **Moving or Tossing? Can VR Tell the Difference?**
    Presenter(s): Joseph Ellis, Dylan McIntosh
    Advisor(s): Dr. Trudi Qi

Virtual reality (VR) technologies have the potential to transform human lives, but to truly unlock their benefits, they must provide personalized assistance to users in their virtual activities. Fortunately, machine learning (ML) models offer a promising solution to this challenge by leveraging data to understand user needs. While modern VR devices offer high-end tracking of the user's head and hands, developing AI technologies for interpreting human activities in VR is still in its infancy. Our project aims to address this challenge by creating ML models that can interpret human intentions and predict their actions based on VR tracking data. We started by analyzing a massive VR dataset containing human activity data in a virtual environment, and our goal is to label VR tracking data collected from users' heads and hands with specific human activities. We developed a novel rule-based system to accurately and efficiently label VR tracking data with specific human activities. By analyzing both hand and object motion data, we developed a hierarchy of rules to distinguish hand-object interactions, such as reaching, moving, and tossing, based on hand motion metrics like hand position, velocity, and proximity to objects. Our proposed rule-based system achieved an accuracy of 91.2% for the "moving" activity when tested on manually labeled data. We plan to fine-tune the metrics for labeling other hand activities. Our next step is to train ML models and integrate them into a virtual rehabilitation program. By understanding the activity the user is conducting, such as reaching an object, our program can provide feedback and assistance on their rehabilitation goals. In summary, our project takes a crucial step towards offering personalized assistance in virtual reality. By developing novel AI technologies to interpret human activities in VR, we can further help users achieve more in their everyday lives.

Electrical Engineering

12. **Metasurface Cloaking**
    Presenter(s): David Giani
    Advisor(s): Dr. Nasim Estakhri

Objects around antennas create interference that disrupts an antenna's waveform, consequently decreasing the antenna's efficiency. In this research, we propose that in the presence of a metasurface, the antenna's original waveform can be recovered or even improved, increasing the antenna's effectiveness. A metasurface is a thin layer of material called metamaterial, which is designed to function with a specific surface profile in order to manipulate the behavior of an incident wave. It is also possible to change the characteristics and the operational wavelength of the metasurface by adjusting its thickness, material, and shape. Their small and light profile distinguishes metasurfaces from other methods of radio frequency wave manipulation. We design our metasurfaces using COMSOL optimization software and Genetic Algorithm Optimization, which optimizes the characteristics of our surfaces to optimally create the desired waveform. The genetic algorithm optimization randomly assigns various points on our

metasurface with a given permittivity value and then measures whether the waveform is closer or further from the desired shape. During our research, we achieved partial waveform reconstruction of a dipole antenna near a metallic wall using these computer-optimized metasurfaces, and we are working on other models now.

English

13. **Evolving Education: An Analysis of the Controversy Surrounding the Teaching of Evolution in Schools and Science and Religion's Incompatibility**
    Presenter(s): Kylee Schwartz
    Advisor(s): Dr. Fredric Caporaso

Charles Darwin's theory, descent with modification or evolution, is essential for basic biology comprehension and has been lauded as one of the greatest ideas of all time. Yet, despite evolution's widespread acceptance worldwide, it has sparked intense controversy in the United States, leading to movements like Intelligent Design campaigning for its removal or modification in science curriculums. As such, this raises the question of whether evolution, Intelligent Design, or both should be taught in classrooms and how to improve these tensions. I will explore the United States' resistance to evolution as a result of America's culture of individuality, the misuse, and misunderstanding of evolution from a lack of education, and, most crucially, Conservative Christian's opposition due to the fear of upsetting one's faith and religion's intimate nature. By approaching this question as an examination of science and religion's compatibility, and analysis of the Kitzmiller v. Dover Area School District trial, the Bill of Right's First Amendment, and prominent atheists/scientists and their books relating to this subject, like Jerry Coyne, I conclude that the evolution controversy and possible resolutions stem directly from science and religion's incompatibility. Due to science and religion's differing methodologies, and their encroaching nature (inability to occupy separate, distinct spheres), relations between the two will only lead to conflict, as seen with the evolution crisis. Therefore, it is imperative that only evolution may and must be taught in classrooms, and science and religion must be kept strictly separate in all aspects to reduce tension. A 2018 PISA international test by the Organization for Economic Cooperation and Development highlights the need for an improved science education, as the U.S. was ranked 20th out of 25 countries for science literacy, indicating a lack of scientific understanding. For American academics to meet the global scientific standards, education must adapt and embrace evolution.

Food Science

14. **Functional Properties of Sunflower Protein Isolates as a Function of Lipid and Polyphenol Removal**
    Presenter(s): Charlene Pok
    Advisor(s): Dr. Lilian Were Senger, Dr. Nana Baah Pepra-Ameyaw

Sunflower seeds are a potential source of phenolic acids and alternative protein. Chlorogenic acid, the predominant polyphenol causes the protein to have a green color at alkaline pH. There is a need to study

the functional properties of the protein, as a function of polyphenol-protein interactions. This research determined the protein yield and functionality as a function of the presence of fat and polyphenols in sunflower seeds. Protein isolate was extracted from sunflower meal after defatting sunflower meal in hexane. Defatted sunflower meal was then dissolved at alkaline pH, and then precipitated out at its isoelectric point. The polyphenols were then removed using ethanol or hydrolyzed with chlorogenic acid esterase enzyme. Determination of protein content using Kjeldahl apparatus determined that solvent extracted samples with and without polyphenols had the highest protein content. Water and oil absorption capacities of the defatted samples with and without polyphenols had the highest water absorption capacity while the non-defatted samples with and without polyphenols had the lowest water absorption capacity. Color measured using Hunter L*a*b* showed that samples without polyphenols had higher L* coordinates while samples with polyphenols had more negative a* coordinates. These results show that the presence of polyphenols has an effect on the solubility and other functional properties of sunflower protein isolates, which can be applied when determining what type of qualities desired from sunflower-based protein powders in foods. This research could be further used to determine how to modify sunflower protein isolates so they are more desirable for consumers.

History

15. **The Ethical Debates Faced by Female Jewish Physicians Within Auschwitz-Birkenau**
    Presenter(s): Sidney Briski
    Advisor(s): Dr. Jeffrey Koerber

During the Holocaust Jewish physicians who treated fellow concentration camps prisoners, yet who also worked under Nazi supervision, faced numerous ethical debates. For example, should a concentration camp prisoner be saved if their likely fate is to be murdered in the gas chambers? What if an SS officer ordered the Jewish doctor to murder the prisoner? Not following SS orders could result in the patient as well as the physician's death, but by following orders the patient may be killed and the physician could live to see another day. This project analyzes the ethical dilemmas present in the memoirs of two female Jewish physicians who were responsible for providing medical care to women inmates within Auschwitz-Birkenau. Auschwitz was the largest death camp where 1.1 million people were murdered between 1940 and 1945. Within Auschwitz, camp hospitals were created for the inmates to receive medical care in order to increase efficiency of slave labor within Auschwitz-Birkenau. Jewish physicians such as Gisella Perl and Lucie Adelsberger were forced to run these hospitals and provide healthcare to women inmates under the oversight of the SS, under horrific unhygienic conditions, as well as with limited-to-no supplies. The hierarchy of the camp hospitals meant that the SS oversaw the work of these physicians; however, the consequence of this was that the severely ill who the SS thought could not be saved within the camp hospital were sent to the gas chambers. This hierarchy led to many ethical debates among prisoner hospital personnel whether to thwart SS demands and risk punishment, or even death. Through the use of memoirs, the experience of female physicians providing medical care within Auschwitz provides insight into their ethical dilemmas and strength of character during a time of lost hope.

16. **Motherhood and the Julio-Claudians: Maternal Power in Early Imperial Rome**
    Presenter(s): Emma Brandel
    Advisor(s): Dr. Julye Bidmead

The Julio-Claudian dynasty of the Roman Empire gave history some of its most infamous ancient women. These famous figures, from Livia Drusilla, the wife of the Emperor Augustus, to Agrippina the Younger, the mother of the Emperor Nero, reflect the views and roles of women during the period. What is most fascinating about these women are their roles as mothers to their children; the succession of the Julio-Claudian empire relied heavily on maternal lineages leading back to Augustus, and these women often took advantage of this fact to wield political power. To examine the roles of mothers in the Early Roman Empire, we must look at the most prolific and powerful mothers of the Imperial Family: Livia Drusilla, Julia the Elder, Antonia Minor, and Agrippina the Younger, and how they used their mother status to gain, wield, and retain political power. The power these women wielded was also recorded by historians of their time, and these images were passed down to the modern day. Given the deeply patriarchal culture these women came from, we must attempt to determine whether certain depictions of them are accurate, how propaganda and political strife have influenced our modern view of them, and whether any of this matters at all to the larger discussion of motherhood in the early empire.

Honors

17. **Understanding How Racism Impacts Porn Stars of Color**
    Presenter(s): Aaron Gutiérrez, Myra Dayrit
    Advisor(s): Dr. Ian Barnard

The purpose of this research project is to analyze and theorize how people of color, such as the Filipino/a/x and Latino/a/x communities, are represented in pornographic contexts. Our findings show that racism manifests within the field of pornography through reinforcing racial stereotypes and narratives that are harmful for their respective communities. Oftentimes, people of color are depicted as “exotic” through an extension of their stage names (which are typically modeled after foods or countries), their costumes, and the scripted roles they portray. In a chapter from The Feminist Porn Book, Dr. Mireille Miller-Young states that people of color are often depicted “desirable for their supposed difference, exoticism, and sexual potency” (108) within porn. This phenomenon is extended throughout the book with Tristan Taormino’s claim that “the intersection of sexuality and race in mainstream porn is complex territory with a history of inequality, stereotypes, and racist depictions. One need only look at titles in the so-called “ethnic” genres of Asian, Latin, or black (because, in mainstream porn, you can only be one)— like Slant Eyed Sluts, Naughty Spanish Maids, and Big Black Asses—to see how race is exoticized, fetishized, and commodified in very particular ways” (261). Whether intentional or not, these “ethnic” genres contribute to the hypersexualization of people of color and other marginalized communities, since their bodies are commodified for hegemonic audiences. In addition to the exotification and hypersexualization of pornstars of color, they are expected to look “ethnic enough” to “qualify” themselves to make ethnic porn. This prevents porn stars of color, but are maybe lighter skinned or lack ethnic facial features, from creating films for these ethnic categories. It is through these various avenues that racism prevails and manifests within the porn industry.

18. **Exposing Nature**
    Presenter(s): Tia Fidaleo
    Advisor(s): Dr. Ian Barnard

In expanding what is defined as an environmental issue we can analyze ecopornography, or ecoporn, which has sparked quite the controversy within the environmental movement. Ecoporn can be described as the representation of nature intended to stimulate the viewer into a state similar to that of watching pornography. Further examining the Fuck for Forest(FFF) non-profit environmental organization founded in 2004 in Norway and it's sister documentary Fuck for Forest by Michał Marczak in 2012, this paper aims to explore the intersections of sexual politics and ecopolitics. Ecoporn serves to not only queer the environmental movement but also expose the ways in which society's negative views of porn restrict nonconventional trains of thought about crucial problems but also perpetuates the narrative that sex is something taboo and unnatural.

Physical Therapy

19. **Comparing Teslasuit Joint Angle Data to Motion Capture During Slips**
    Presenter(s): Audrey Arenal, Rachelle Beshay
    Advisor(s): Dr. Rahul Soangra, Michael Shiraishi

Capturing accurate joint angle data of the gait cycle is vital in understanding the kinematics of the human body, and essential for the research and analysis of human subjects. This study collected joint angle data using Teslasuit, a full body device that captures motion data using Inertial Measurement Unit, in order to analyze the accuracy of its data collection in comparison with motion capture during a slip trial. The accuracy of the Teslasuit allows for a more convenient and accessible method of collecting joint angle data, along with the ability to collect data in more complex gait cycle scenarios which are limited by motion sensor collection. Data was collected from 5 males and 7 females, in which participants completed a 5-minute walking trial, followed by a 10-minute blind slip trial. During the blind slip trial, the treadmill momentarily reversed at the subject's right heel strike at 5 randomized time frames, which induced the slip. During both trials, both knee and hip joint angle data was collected using the Teslasuit, which contains 14 Inertial Measurement Unit (IMU) Sensors, and motion capture data, through 34 reflective markers placed on the bony processes. The joint angle data of the Teslasuit will then be compared to the data collected from the motion sensors, in which the error of data points throughout the gait cycle will be analyzed, along with variation or consistency present within the possible error. The error in joint angle during the gait cycle will also be analyzed for the gait cycle following the slip, in order to analyze the ability of the Teslasuit to recalibrate, and continue to collect accurate data. It is hypothesized that the Teslasuit will collect joint angle data before the slip with precision and relative accuracy, but the consistency in error may fluctuate after the slip. With the expectation that Teslasuit provides accurate data, it can be used in the future to detect subtle gait kinematic changes due to slip, and prevent possible injury through intervention (such as an inflatable hip guard).

Political Science

20. **"Religious Zealotry or Racial Bigotry? Investigating the Correlation of White Christian Nationalism and its Racist Motivations in America"**
    Presenter(s): Christian Douglass
    Advisor(s): Dr. Ann Gordon

Contrary to the mainstream beliefs of Christianity and democratic values, White Christian Nationalists deflect the ideals of these groups and values in numerous ways leaving a question as to where these behaviors arise from. Further understanding the general makeup of a White Supremacist, there seems to be an oddly repetitive association with Christianity while at odds with its inclusive and democratic values in a Biblical context. In this research study, I examine the extent of a Christian's religiosity in America and its impact on racism, xenophobia, and political violence in America. Using the Chapman Survey of American Fears, I find a moderately strong relationship between the religiosity of Christians motivating racist and xenophobic ideologies in addition to Government skepticism. Through my research, I have found evidence in Biblical text along with historical contexts to further understand the connection between the religiosity of Christians with racism, xenophobia, and political violence. Research on American colonization further develops my understanding of how passionate church members have enabled these ideologies to take shape in the present day. Furthermore, the recent January 6th attacks on the Capitol prove the relevancy of White Christian Nationalism today as a reliance on Biblical texts and entitlement created Government skepticism igniting violence with racist and xenophobic undertones. Ultimately while Christianity appears to be an inclusive community, many fail to see the illegitimacy behind White Christian Nationalism as they exaggerate the texts of the Bible and historical contexts to further justify racism, xenophobia, and political violence.

21. **The Politicization of the COVID-19 Vaccine**
    Presenter(s): Julia Gaspari
    Advisor(s): Dr. Ann Gordon

The COVID-19 pandemic, a global health predicament, quickly turned into something much more starting in the year of 2020. Efforts to fight the pandemic through vaccinations were hindered by politicization and anti-science beliefs. Politics, economics, and cultural agendas frequently use and distort science. When people disregard reasonable and advantageous scientific advice, the politics of science can limit the benefits that scientific advancements, such as vaccines, can provide. Politicization admittedly had a role in the population's hesitation to get the COVID-19 vaccine, specifically in the United States. This paper will explore current research surrounding this idea, considering factors such as the association of conservative values like freedom of choice to a person's decision to become or not become vaccinated. Using nationally representative samples from the Chapman Survey of American Fears to evaluate the relationship between Trump voters and vaccine hesitancy, it was found that Trump's supporters had significantly higher vaccine anxiety when compared to other voting categories and the general public. These results provide valuable insight into levels of vaccine hesitancy in the overall population. Finally, a systematic review was conducted assessing vaccine acceptance behaviors and hesitancy on a global scale. This study provided further

contextualization of voters' opinions and vaccine decisions across various cultural fronts. Future research could explore how these hesitant attitudes have evolved in the time since the beginning of the COVID-19 pandemic, comparing past and present ideas.

22. **A Critical Race Lense On The Rise Of Conservatism.**
    Presenter(s): Hoda Mostafa
    Advisor(s): Dr. Ann Gordon

In recent generations, public opinion of conservative ideology has declined. Despite overall decline in support for conservatism, older generations of any ethnicity are more likely to identify as conservative in all demographics. With the aid of the generational gap theory, I investigate the relationship between conservatism among minority groups and religiosity and traditionality.
By analyzing American National Election Studies, a national survey of U.S. adults. These surveys are based on voting behaviors and feelings of closeness to the Republican party among Black, Asian, and Latino communities. It is expected to find a correlation between the race and age of voting for conservative parties. In comparison, the generation gap is heavily discussed. This research, in particular, aims to view the preexisting theory with a critical race lens and reevaluate the direct correlation between traditionalism in culture and having a likelier conservative ideology.

23. **The Affordable Housing Crisis: How Californians Respond to Local and State Efforts to Minimize the Crisis and Decrease Homelessness**
    Presenter(s): Arleth Ulloa
    Advisor(s): Dr. David Shafie

California has fallen into a severe housing crisis, making it the fourth most expensive state to live in and holding the third highest rate of homelessness in the US. Orange County has seen many of the repercussions of these climbing rates, and residents seek a solution from local and state governments. Using data from the Chapman University Orange County Annual Survey conducted in 2018 with approximately 700 respondents, my research will be on housing. Given that over 40% of residents believe that housing affordability and poverty are the most significant issues in the county, my question is to find ways that the county could respond to these concerns. What policies or initiatives in Orange County that target affordable housing and homelessness would residents be most receptive to? Is there a correlation between higher mean income zip codes and their receptiveness to these policies/initiatives?
I speculate that my research and findings will conclude that OC residents will be more receptive to policies that create more housing developments with a mix of affordable and market-price units rather than an entire complex targeted at lower-income communities. I do not believe that the creation of shelters, both short and long-term, would be well received by residents. From my initial research, it's understood that the public opinion on affordable housing and how neighborhoods will take their position on affordable housing projects based on how it will affect them and who the beneficiaries would be (Tighe 2010). Therefore, I can also hypothesize that zip codes with higher means of household income are less likely to implement or pass any policies in relation to addressing the lack of affordable housing and homelessness.

While at the same time, I think zip codes with lower means of household income will be more likely to implement said policies.

24. **Fear of Mass Shootings in America: Influence of Mass Media**
    Presenter(s): Eva Jones
    Advisor(s): Dr. David Shafie

The fastest growing fear in America is fear of being a victim of random and mass shootings. This paper will analyze and observe the media and demographic factors in relation to fear of mass shootings and the power of mass media. I intend to examine the extent to which fear of mass shootings is predicted by certain news media outlets including the following variables: social media, online news websites, and national television. Relying on the Chapman Survey of American Fears, a representative national sample of U.S. adults, my study focuses on the significance of this fear, sub-factors, and current events. This is relative to the increase of school shootings across the country and in-class nationwide shooting safety drills students participate in today. It is important to study and identify factors that contribute to our societal fear, and if specific mass media resources are directly affected. The demographic predictors studied include, gender, race, age, education level, and religion. The expected results are that mass media will have a significant impact on Americans' fear of mass shootings. It is also found that there are other external factors that may lead to the contribution of Americans' fear of random or mass shootings. The effectiveness and influential notion of mass media bringing awareness to causes and demographic predictors of mass shootings is explored. The U.S. without random or mass shootings is an unrealistic standard, the independent variables are significant contributors to Americans' fear and questions our country's moral character and behavior. It is a basic human right to life, Americans live in fear of becoming the victim of a mass shooting in public places, schools, concerts, and holiday celebrations. Understanding how influential the news media is and why it focuses attention on the violence plaguing America and the need for decisive action.

25. **"What is the Impact of Social Media on United States Presidential Elections?"**
    Presenter(s): Nicholas Ferrone
    Advisor(s): Dr. David Shafie

This paper explores the impact of social media on the United States Presidential Elections. Social media platforms such as Facebook, Twitter, Instagram, and YouTube have transformed how political campaigns are run and how voters engage with the political process. One of the critical impacts of social media has been the ability of campaigns to reach a larger audience than traditional media platforms. Social media allows candidates to post updates, share photos and videos, and engage with voters in real time, increasing the visibility of their message. The paper also discusses how social media has allowed campaigns to amplify their messages, with viral posts and videos reaching millions. However, the paper also addresses the controversy surrounding social media in the United States Presidential Elections. There have been concerns over fake news, misinformation, and foreign interference. These issues have raised questions about the role of social media in shaping public opinion and the validity of the electoral process. The paper explores these concerns and their potential impact on the future of social media in political campaigns.

Overall, this paper concludes that the effects of social media on the United States Presidential Elections have been significant. Social media has allowed political campaigns to reach a more extensive and diverse audience and engage with voters in real-time. However, the paper also highlights the need to address the challenges that come with the use of social media, such as fake news and foreign interference, to ensure the integrity of the electoral process. The paper concludes that social media will continue to play an essential role in United States Presidential Elections and that it is crucial to address these challenges to ensure a fair and democratic electoral process.

26. **The Power and Implications of Young Voters**
    Presenter(s): Westley Hall
    Advisor(s): Dr. David Shafie

This research will be focused on finding the connection between finding young people's most recent perceptions of Joe Biden as a political leader and what implications that has for him serving the country currently and in the future. Why should we focus on or care about what young people think about modern day politics? Fisher (2020) points out the exact voting power of young Americans by noting the amount of eligible and actual voters of this age group. My research will add to this observation by emphasizing the importance of young people's perceptions of political leaders (in this case specifically focusing on Joe Biden) actually are. This research will comment on why young Americans' perceptions of politics and voting patterns are important by pointing to past literature that emphasizes the voting power that Millennials and Gen Z Americans currently have and will have in the future. The main research question behind this research is, What are young American's feelings and perceptions of Biden serving as president and what implications do these feelings have? Some aspects that will be observed, measured, and accounted for will be age, race, and gender and how their feelings differ towards how they feel about Biden. I will look specifically at how people of color versus white people feel about Biden and how women versus men feel about him. I will be utilizing the data obtained through the ANES (American National Election Study) that will give me insight into how the people they surveyed feel about Joe Biden as a leader. This research will contribute to observing how young people feel about Joe Biden and what implications their feelings have and the powerful message that this has to left-leaning politicians.

27. **Freshman Members of Congress and Their Impact on the American Political Agenda**
    Presenter(s): Rolando Sanabria
    Advisor(s): Dr. David Shafie

Within recent years, many media sites and political commentators have brought attention to the rise of the influence of freshmen politicians within Congress. Due to their growing influence and power, these politicians have significantly shaped the political agenda and what issues should be addressed for Americans. With the rise of non-partisanship within Congress, both in the House of Representatives and the Senate, it has become crucial to understand what direction Congress is taking when it comes to the influence freshman politicians, more specifically Millenials and Generation X, have when it comes to the direction of policies and the overall political environment. Research studies from the Pew Research Center will be analyzed in various areas to understand this influence better. The first data set, entitled

'Generational composition of the House of Representatives, as of the state of each Congress in 2017 (115th) and 2019 (116th)' examines how Millennials and Gen X are increasing their positions in the House of Representatives, with a higher increase seen with the Democrats. The second data set entitled '% with political values' aims to understand the Millenials' ideological differences compared to previous generations. This survey was conducted through a survey of an undisclosed number of U.S. adults conducted June 8-18 and June 27 - July 9, 2017. In addition, scholarly journals will be analyzed that analyze two topics. First, freshman vs. incumbent voting practices from the Prohibition era will be examined to help create a historical standard to help predict how the younger generations could affect American politics. Second, an overview of the polarization of American politics will be presented, and its implications for mass political behavior and public policy outcomes. I hope to understand Freshman politicians' growing influence within Congress and its impact on American politics while also creating predictions about how this will affect future politics within America.

28. **Political Partisanship and Intimate relationships: Exploring The Effect of The Similar & (Dis)similar**
    Presenter(s): Michael Ricci
    Advisor(s): Dr. David Shafie

This study attempts to examine the relationship between the political agreement and disagreement within close relationships and how it influences political participation, such as the likelihood of turnout, protest, and other forms of participation. Additionally, this study will investigate if this relationship varies by other factors such as gender, political affiliation, marital status, and other relevant variables. Using Anes data, this study will use regression analysis to test the relationship of political homology in groups to the likelihood of different types of political participation. These findings have important implications for understanding the role of intimate relationships in shaping political behavior. I predict the findings will show that political agreement within intimate relationships has a positive relationship with all fields of political participation and that marital status, gender, and political affiliation will show a significant deviation from one another.

Psychology

29. **How Demographics Influence Self-Image**
    Presenter(s): Stephanie Yu, Leyla Rakshani, Melissa Brillhart
    Advisor(s): Dr. Aaron Schurger

When creating psychological research surveys, demographics are typically recorded at the end of the main survey. The reasoning behind psychologists placing demographic questions at the end can be to omit any biases from the participants (Hughes et al., 2016). However, does the placement of these types of questions influence people without them knowing? This research project will answer these questions to find the effects of demographic question placement on participants. Specifically, can demographic question placement prime individuals and their self-rating of attractiveness and the overall impact of demographic placement on survey results? To test this question, this project will conduct two versions of

the study to compare self-ratings of overall attractiveness. In version one, individuals will first answer demographic questions, rate the attractiveness of celebrities, and then rate their own attractiveness. In version two, participants will first rate the attractiveness of celebrities, rate their attractiveness, and then answer demographic questions. All ratings will be on a scale of 1-10. After gathering the data, we will compare the overall attractiveness ratings between the two groups to see if there is a meaningful difference. So far, a preliminary study has been done on 120 individuals, mainly Chapman students. Participants primed with their demographics at the beginning rated their attractiveness lower than participants who answered them at the end. In the future, we plan on conducting this study on Prolific to see if this finding applies to the general population. Overall, this research will further our understanding of the impacts of demographic question placement. 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.

30. **Re-Engagement and Roommates: Analyzing Gender and Sexual Orientation Differences in Reconnecting With Past Partners and Platonic Roommates During the First Five Months of the COVID-19 Pandemic**
    Presenter(s): Valentyna Simon, Alex Kraft
    Advisor(s): Dr. Amy Moors

The first few months of the COVID-19 pandemic limited people's interactions as a result of social distancing and stay-at-home orders across the U.S., and research documented declines in partnered sex during this time (Hensel et al., 2020). It is unclear if people who were single during the first few months of the pandemic found sexual connections with ex-partners or roommates. In the present study, we examined the prevalence of people contacting ex-partners and non-romantic roommates to engage in sex.
We analyzed data from a national sample of people who were currently single in the U.S. as part of The Kinsey Institute's annual Singles in America study (N = 4,264; 57.3% women; 42.5% men). Data was collected in June-August of 2020 when most states issued social distancing guidelines. Results show that 15% of people initiated re-engagement with an ex during these months. Of 736 people (out of 4264) who reached out to an ex, 55% texted or direct messaged, 26.5% phone/video chatted, 8.2% met in-person, 5.8% sexted/had phone sex, and 2 people had sex in-person with their ex. Eleven percent of singles had sex with their platonic roommate for the first time, 13% said that they had sex with their roommate prior to lockdown, and 76% said they did not have sex with their roommate.
In the future, we plan to examine potential gender and orientation differences in engaging in sexual activity with ex-partners and roommates. We hypothesize that LGBTQ individuals will show a higher frequency of initiating sexual contact with ex-partners or roommates because gay individuals have reported higher levels of post-breakup connectedness than heterosexuals (Harkless & Fowers, 2005).

31. **Maternal Employment and Mother-Child Relationships**
    Presenter(s): Jenna Funkey
    Advisor(s): Dr. Desiree Crevecoeur-MacPhail

In the United States, 55% of mothers with children under the age of 18 are employed full time; this is a significant increase from the previously reported 34% fifty years ago (Pew Research Center, 2019). With

this rise of women in the workforce, has come a conversation concerning the impacts of maternal employment status during childhood on relationships in early adulthood, a conversation which remains both enveloped in controversy and critical to the wellbeing of future generations. John Bowlby and Mary Ainsworth's (1991) Theory of Attachment proposes that the infant-caregiver relationship is a foundational building block for the development of healthy attachment styles throughout childhood and long into adulthood, past research has both supported and refuted the costs associated with maternal employment. The purpose of this study was to seek clarity on the subject by exploring the impacts of maternal employment status during childhood on the mother-child relationship in young adulthood. It was hypothesized that maternal employment during childhood would negatively impact early mother-child relationships but positively impact mother-child relationships in young adulthood, as well as positively impact expectations of success in young adulthood. Young adults with working mothers were also hypothesized to have more positive perceptions of maternal employment. Statistically significant results would affirm these hypotheses and demonstrate that maternal employment has a net positive impact on childhood development, an important step towards reducing the stigma so often associated with being a working mother.

32. Socioeconomic Status and the Risk of Eating Disorders
Presenter(s): Angelina-Rose Thalheimer
Advisor(s): Dr. Jennifer Robinette

Emerging evidence has suggested that eating disorders (ED) may be an outcome of socioeconomic disadvantage. Though typically associated with youth, ED prevalence is close to 2% among US adults over 18, with binge eating most common among these older individuals. Additional research has documented associations between socioeconomic status (SES) and ED, but these vary where sometimes higher and sometimes lower SES relates to greater ED prevalence. This paucity of research leaves several questions unanswered, including how SES relates to ED and what factors might explain its association, specifically among older adults. Given extensive literature documenting the development of maladaptive eating habits to cope with stress, binge eating may represent a pathway from the stressful circumstance of low SES and ED. Using data from the second wave of the Midlife in the United States (MIDUS II) study, we tested whether low SES using education, household income, and perceived financial status would relate to an increased likelihood of seeking out self-help groups for eating problems, partially explained using maladaptive coping strategies such as eating more to comfort oneself. Results did not support this hypothesis, as people with higher SES were more likely to report attendance in groups for eating disorders than those with lower SES. Although eating for comfort was significantly correlated to eating problem self-help groups, this maladaptive coping strategy did not explain the relationship between attendance of these groups and SES. These unexpected findings may be explained by research indicating that people with low SES are less likely to seek medical help generally when compared to those with higher SES and, therefore, may not receive diagnoses as readily. Future research would benefit from more granular data that probes for actual ED diagnoses and their forms (e.g., anorexia nervosa, bulimia, binge eating), as it may vary as a function of SES.

AF 209A

Psychology

11:00am-11:15am

The Effects of Extracurriculars on Personal Beliefs and Substance Use
Presenter(s): Karlyn Oura
Advisor(s): Dr. Desiree Crevecoeur-MacPhail

The prevalence of parents involving their children in extracurricular activities has greatly increased, as it aids in developing social, problem-solving, and supplemental skills. Previous research has focused on extracurricular activity's effect on mental health; however, there were a lack of studies focused on its long-term effects. This study aims to examine the long-term goals and influences extracurricular activities have on high school students. In addition, previous research has found correlations between drug use and approval within specific extracurriculars. The current study expected to find that engagement in extracurricular activities influenced the expectancy to attend higher education past high school. Participation in physical contact activities would result in higher rates of substance use. Students engaged in non-physical contact activities are more likely to disapprove of substance use. Similarly, students in extracurriculars are more likely to perceive their peers to disapprove of substance use. The results of this study provide insight to advise parents or guardians about the attitudes and experiences their children will be exposed to while in extracurricular activities.

11:15am-11:30am

Critical Race Theory: An Empirical Investigation of its Benefits
Presenter(s): Saba Modaressi
Advisor(s): Dr. Desiree Crevecoeur-MacPhail

Within the last decade, discussions regarding the implementation of critical race theory in education have gained significant controversy among educators and politicians. Although empirical research on critical race theory is limited, conservative state and district legislators continue to place bans on the teaching of critical race theory (CRT) in K-12 schools (Carter, 2021). The purpose of this study was to build empirical research on CRT, specifically examining whether a course utilizing a critical race curriculum is effective in reducing negative stereotype beliefs and improving attitudes toward critical race theory. Thirty undergraduate students who were enrolled in the course, IES 102: The Social Construct of Difference, at Chapman University were selected to participate in this study. Within the first two weeks of the course, students were recruited to participate in an online pre-test that assessed their beliefs in stereotypes and attitudes toward the concept of critical race theory. In the last four weeks of the course, students who participated in phase one were recruited back to complete a similar post-test, assessing their beliefs in stereotypes and attitudes toward the concept of critical race theory once again. To examine this data, a t-test and correlation coefficient was calculated. The author expects to find that exposure to the critical race

theory course will reduce the student's beliefs in negative stereotypes while improving their attitude toward critical race theory. Additionally, it is hypothesized that students who identify as more conservative will have a more negative attitude to CRT, and students who identify within a minority community will have fewer beliefs in negative stereotypes. These results are significant as it demonstrates that a critical race curriculum is effective in eliminating large-scale social issues such as discrimination and/or oppression. This would provide empirical evidence reflecting why a critical race curriculum should be incorporated in schools.

11:30am-11:45am

How Does the Presence of Divorce Affect Children's Anxiety Surrounding Romantic Relationships?
Presenter(s): Hannah Fereday
Advisor(s): Dr. Desiree Crevecoeur-MacPhail

With divorce no longer being viewed as taboo in some cultures, the number of marriages in the United States resulting in divorce has reached a high of 50 percent, with the average marriage lasting only eight years (Divorce statistics and facts, 2022). Due to these increasing rates, more children are being forced to live with the aftermath of separated families and dealing with the lingering effects of parental divorce. Past literature has shown that children who experience parental divorce suffer from increased behavioral difficulties, less time with father figures, and feel more hesitant towards commitment in relationships than children who do not experience parental divorce. The current study specifically inspected how parental divorce affects individuals and how the social learning theory impacts an individual's thoughts toward divorce and future romantic relationships. To determine the severity of effects on individuals due to parental divorce, this study utilized survey research to collect data for analysis from students at Chapman University. If the results are found to be significant then this will further emphasize the drastic effect that parental divorce has on individuals and how parents need to consider these lasting effects before they make the decision to get divorced. This could also be used to inform intervention groups/organizations to better support couples who are looking to get divorced or have experienced parental divorce. Assuming that the results of this study are significant, this should prompt therapy interventions to be offered and accessible to any child who goes through parental divorce, with therapy being offered at schools or from private therapists to prevent the negative consequences of parental divorce.

11:45am-12:00pm

How Single Parent Households Affect the Sociability of Children
Presenter(s): RJ Casiquin
Advisor(s): Dr. Desiree Crevecoeur-MacPhail

Family dynamics that differ from the traditional nuclear family have become more increasingly common in the home. Past research has examined differences between single parent households and two-parent households in terms of sociability. This research has shown that children in single parent homes displayed less social competence than children in two-parent homes, based on the children's interaction with their

peers in school (Díez et al., 2021). However, less research has explored the effect of reintroducing a second parental figure after the separation of children's parents. This study retrospectively examined children's sociability as a result of their parents' relationship status as well as several aspects of the children's living situation. The participants were asked questions regarding parents' relationship status while growing up, their sibling status, and their relationship quality with their parents. These aspects were examined in terms of sociability under the theory of Relative Deprivation (Runciman, 1966). Children in homes in which a second parent has been reintroduced and experienced longer duration before the reintroduction will have decreased sociability. The presence of siblings or better-quality relationship between parents and their children will improve their sociability. The results of this study will inform parental strategies to create a favorable environment for children to develop their sociability as well as minimize the stigma of single parenting.

AF 209B

Integrated Educational Studies

11:00am-11:15am

Understanding the Filipino/a/x American Experience in Higher Education
Presenter(s): Myra Dayrit
Advisor(s): Dr. Stephany Cuevas

The purpose of this study is to better understand how the cultural values of Filipino/a/x Americans impact their aspirations and plans for higher education to improve their success. This study, in particular, will explore the impact of their relationship to their Filipino culture, their home life, and whether or not their parent(s) were engaged in the college process and aspirations. Asian Americans are often underrepresented in higher education research due to their wrongful association with the model minority stereotype. When disaggregating Asian American students in educational research, Filipino/a/x Americans are noticeably underrepresented despite being the third largest among the Asian American population. Existing research note that Filipino culture stresses the significance of family values and an emphasis on education. Researchers have made connections between these Filipino cultural values and the U.S. colonial history in the Philippines. This dynamic may currently impact Filipino/a/x Americans' experience in higher education.
This study contributes to the limited understanding of Filipino/a/x American experiences in higher education contexts. It examines Filipino Americans, and the impact their culture and home life have on their plans for higher education. The following question guides this study:
How do Filipino cultural values impact or influence Filipino American students' higher education aspirations, goals, and plans?
20 self-identified Filipino/a/x American college students who are 18 years or older and currently enrolled in a community college or university in the United States were interviewed. They were asked questions about their student experiences on and off campus, family involvement in the college process, relationship with their Filipino culture, and how that relationship manifests with their peers. Common themes noted

in the preliminary findings include feeling a cultural disconnect, familial obligations, and difficulty finding community within cultural clubs. The next steps for this study are to continue with data analysis.

11:15am-11:30am

Understanding How College Access Professionals Utilize Funds of Knowledge When Working with the Families of Prospective First-Generation College Students
Presenter(s): Myra Dayrit
Advisor(s): Dr. Stephany Cuevas

Funds of Knowledge (FoK) (Moll et al., 1992) acknowledge the explicit and nonexplicit skills and knowledge learned at home. The literature has noted the significance of the impact of the knowledge gained in the home on students. Prospective first-generation college students (PFGCSs) and their families are often represented under a deficit perspective in research, thus applying the FoK framework counters these harmful perceptions. In this study, I investigate how funds of knowledge potentially play a role in college access and family engagement research. Decades of research have noted the significance of a system of support during the college-going process. Educators, including teachers and school counselors, can aid and help PFGCSs with their college-going aspirations. For PFGCSs and their families, these educators serve as institutional agents, providing them with social and cultural capital about college. However, teachers and school counselors are often limited in their capacity to provide these students and families with specific and individualized college support due to their other responsibilities. College access professionals (CAPs) offer a solution to fill this need, yet, there is a limited understanding of the relationships between CAPs and PFGCSs and their families.
Based on the experiences and perspectives of 20 CAPs, this qualitative study explores these educators' work with the families of PFGCSs. Building from family engagement research that highlights the importance of family-school partnerships and applying the FoK theoretical framework, this study highlights how CAPs can effectively communicate and support PFGCSs and their families. Study findings are consistent with existing literature and find that FoK of CAPs and CAPs recognizing the FoK of the students' families are beneficial when working with PFGCS families. Thus, this study offers the opportunity to expand family-school-student partnerships for student success within a college-going context, reciprocating the positive results in other K-12 settings.

Sociology

11:30am-11:45am

Effectiveness of Sustainability Policies in Higher Education: Adoption, Adherence, and Achievement
Presenter(s): Eva Stanton
Advisor(s): Dr. Stephanie Takaragawa

As the prioritization for environmental advocacy and sustainability policy grows among institutions, universities play a critical role in finding solutions through education, research, and community

participation. However, the effectiveness of these policies can vary depending on several factors, such as the availability of resources, degree of institutional commitment, and level of stakeholder engagement. Literature suggests that adopting sustainability policies and integrating environmental concerns into the university structure not only positively impacts the environment but also improves the institution's reputation, student engagement, education, and overall quality of life at the university. Yet even after policies are adopted, longstanding challenges can stand in the way of adhering to sustainable practices, such as resistance to change, lack of resources, and competing priorities. By integrating information from institutional websites and organizations that rank university environmental impacts, this project seeks to determine areas of strength and weaknesses in the effectiveness of such policies through an ethnographic case study. Universities leading sustainable development often can overcome issues associated with the longevity of sustainable goals by fostering a culture of environmental concern, engaging stakeholders, allocating sufficient resources, and integrating sustainability into their growth goals and internal strategy. With the proper structure, implementation, and support, sustainability policies help universities achieve their goals and contribute to a more sustainable future for the surrounding communities.

Biochemistry and Molecular Biology

11:45am-12:00pm

Down-Regulation of Androgen Receptor in Breast Cancer Cell Lines Using Natural Product, Apigenin
Presenter(s): Yeseom Cho
Advisor(s): Dr. Marco Bisoffi

Unlike early breast cancer, triple-negative breast cancer (TNBC) tends to be untreatable because it lacks estrogen receptor, progesterone receptor, and human epidermal growth factor 2, against which medicines exist. Since TNBC accounts for about 10-15 % of breast cancer and is deadly, the experiment to down-regulate the TNBC was studied. According to the previous study, TNBC expresses a high level of androgen receptor (AR), which will be the critical receptor to downregulate the expressions of TNBC eventually. The purpose of the experiment was to target the androgen receptor (AR) in TNBC by specifically using the natural product called apigenin. Three breast cancer cell lines, MCF-10A (non-cancerous epithelial cell line), MCF-7 (breast cancer cell line with estrogen and progesterone receptors), and MDA-M-453 (triple negative breast cancer cells), were cultured to study the effect of apigenin in androgen receptor for TNBC. MCF-10A, MCF-7, and MDA-MD-453 were all put into the control DMSO, and the concentration of 50 µM of apigenin. The phenotypical change of three cell lines was studied to compare the control and treatment groups. In addition, the Bradford assay using bovine serum albumin (BSA) was analyzed to detect the protein concentration. As a result of the Bradford assay, the protein concentration of cell lines treated with apigenin was lower compared to the control group of all three breast cancer cell lines. In addition to the Bradford assay, protein expression of androgen receptors for each MCF-10A, MCF-7, and MDA-MB-453 were measured and analyzed by Sodium dodecyl sulfate polyacrylamide electrophoresis (SDS-PAGE) and Western blotting.

AF 209C

Dance

11:00am-11:15am

Tap Musicians: Exploring the Use of Tap Dance as an Instrument Through the Lens of Notation
Presenter(s): Kurt Horney, Kaia Goddard
Advisor(s): Julianne Pedersen-O'Brien

Known to very few, there is a written notation for tap dance: Kahnotation. Our research explores the integration of Kahnotation with musical notation. Tap dance is considered to be a performing art rather than a musical instrument. Our goal for this research is to develop a musical notation, derived from Kahnotation, that uses the bass clef and treble clef to incorporate tap as an instrument into a musical score. Multiple versions of tap notation exist; however, one universal form has yet to be codified within the performing arts industry. Synthesizing previous tap notations (that focus on movement patterns) and recalibrating these methods to be used for the codified musical notation. This research bridges the gap between what it means to be a dancer versus a musician. This notation requires that both dancers and musicians are able to understand and execute the written score solely based upon the new notation. Tap dancers are the foundation of this research which correlates to our main objective: rebranding the traditional verbiage of a dancer to a musician.

Film

11:15am-11:30am

Showing the Mystic: Whereof One Cannot Speak, Thereof One Must Make a Movie
Presenter(s): Mason Dickerson
Advisor(s): Dr. Kelli Fuery

In spite of his broad reaching influence over the field of philosophy, Ludwig Wittgenstein
has been curiously neglected in the developing field of media studies, which historically favors continental and post-structuralist approaches to media affect and ideology. With attention to Wittgenstein's discussion of the function of language, picture theory, and the limits of what language can access (the mystic), this paper seeks to re-contextualize Wittgenstein's philosophical project – specifically, his singular treatise Tractatus Logico-Philosophicus – within the realm of filmmaking and viewership. The paper proposes a Wittgensteinian photo-ontology utilizing his picture theory, constitutively suggesting cinema, as a medium which stimulates sight and sound to often profound somatic effect/affect in the viewer, can capture the limits of language and being: the "mystic" in the same way our own sensory data in life can experience but fail to translate, or signify directly. Cinema is therefore framed as a form of "silence," playing with Wittgenstein's famous quote – we cannot speak directly of the limits of experience, but we can show it through images in the same way we experience it in life. Cinema is the language of the mystic, and through

cinema the mystic can be explored as an end in itself – the paper explores the short works of filmmakers such as Apichatpong Weerasethakul and Stan Brakhage in this capacity, and further the possibility of "mystic" style in filmmaking. Though typically disregarded in the realm of aesthetics, Wittgenstein's Tractatus can be used as a device to frame cinema as a medium which accesses the mystic and denies the direct signifying processes of language in its ontological primacy.

11:30am-11:45am

Submitting to Memory in "The Night Porter": Memory Work as Disruption of Natural Attitude
Presenter(s): Sophia Bain
Advisor(s): Dr. Kelli Fuery

This presentation synthesizes the existing scholarship on Liliana Cavani's 1974 film The Night Porter with memory studies to analyze if the film implicates our natural attitude toward women's submissive situation. The film begins when Lucia (Charlotte Rampling), a death camp survivor, and Max (Dirk Bogarde), a former SS officer, bump into each other by chance in 1957 Vienna and begin to replay the sadomasochistic sexual relationship they had during Lucia's internment. Max is working as a night porter at the hotel where Lucia is staying with her American husband. When her husband leaves Vienna to continue his travels, Lucia decides to stay behind with Max, and the distinction between past and present begins to blur. In conjunction with philosopher Manon Garcia's Beauvoirian analysis of women's submissive situation, I build upon Dr. Kelli Fuery's Beauvoirian analysis of the film in her chapter "Must We Burn Cavani?: Moral Ambiguity in The Night Porter" to analyze the relationship between subjects and their memories as similarly ambiguous to moral ambiguity in the film. I argue that the recognition of memory's ambiguity is essential in performing Annette Kuhn's idea of "memory work," which the film asks us to perform by calling into question the historical situation of women's submission. Finally, I consider how Kuhn's memory work is related to the disruption of a Husserlian natural attitude and conclude that Cavani's film disrupts our natural attitude toward women's submission and our memory of women's submission to move us toward a future feminist situation.

Interdisciplinary

11:45am-12:00pm

Reflective Exploration of Inspiration & Growth in Florence, Italy
Presenter(s): Emalia Katelanis
Advisor(s): Dr. Federico Pacchioni

The project explores the concept of "rebirth" and how growth follows traumatic times, as seen through the lens of Florence, Italy, over an Interterm travel course. The research features a self-reflective method, whereby the researcher's point of view becomes part of the object of examination. The ideas come from an interesting perspective where the researcher muses on the evocative historical parallels between the Black Death of the 14th century and the recent COVID-19 pandemic. The central research question is: How does the idea of "rebirth" manifest itself in Florentine culture, history, and personal experience, and what

can we learn from it? External research includes drawing on a variety of scholarly sources, such as historical accounts, literary works, and personal interviews with local residents and experts. The idea of "rebirth" is situated in the broader context of Italian Renaissance Humanism and its emphasis on individual potential and creativity. It examines how the Florentines used the experience of suffering as a catalyst for creativity, innovation, and personal growth. Through the integration of various sources and personal reflections stimulated by symbolic site visits, fascinating insights were uncovered into the history and culture of Florence, as well as contemporary and lived experiences of growth and transformation. The results yielded a deeper understanding of how individuals and communities can repurpose the past to inspire and grow, even in the face of adversity. Thereby, just as Florence's Renaissance emerged from the Black Death pandemic, we can find beauty in suffering and foster growth in ourselves and our communities following the COVID-19 Pandemic. By exploring the intersections of beauty, inspiration, and growth, the project offers valuable insights into the human capacity for resilience and creativity.

AF 209A

Psychology

12:30pm-12:45pm

Employment, Stress, and Physical Health During the COVID-19 Pandemic: The Moderating Role of Social Support
Presenter(s): Helen Lee
Advisor(s): Dr. Desirée Crèvecoeur-MacPhail, Dr. Tara Gruenewald, Dr. Brooke Jenkins, Dr. Julia Boehm

The COVID-19 pandemic has brought a number of negative changes in the employment status of many populations, including college students. Past research consistently suggests that stressful life events such as employment change are linked to both higher psychological stress and worse physical health outcomes. The objective of the present study was to investigate how employment status change is associated with perceived stress and physical health of college students. Additionally, the moderating role of perceived social support in these associations was examined. Lastly, the longitudinal analysis investigated whether this moderation effect was maintained in the follow-up survey after a five-month period. The data were collected through an online survey administered across five time points in 2020 on students enrolled at Chapman University (n = 292). It was hypothesized that students whose employment status has been impacted by the COVID-19 pandemic will show higher levels of perceived stress and worse physical health outcomes. It was also hypothesized that perceived social support will weaken the associations between employment status change and perceived stress and physical health. Furthermore, this moderating effect of perceived social support is predicted to be maintained after five months. If these hypotheses are supported, this study would show significant evidence of the role of employment in college students' psychological and physical well-being, as well as the importance of social support in reducing the health risks imposed by negative changes in employment status.

12:45pm-1:00pm

Exploring the Relationship between Participation in College Hookup Culture, Sociosexuality, and Attachment Style
Presenter(s): Tanshi Mohan
Advisor(s): Dr. Desirée Crèvecoeur-MacPhail

The taboo around casual sex has been decreasing over the years, especially on college campuses; it is estimated that around 60-80% of college students engage in hookups (Garcia et al., 2013). Hookup culture is a college campus phenomenon that encompasses the social scripts, beliefs, and norms around casual sex among college students (Allison, 2019). The term "hooking up" includes a range of sexual behaviors, from kissing to intercourse, that have no expectation of a committed relationship after the encounter

(LaBrie, 2012). The goal of this study is to understand how differences in an individual's attachment styles and sociosexuality (attitude towards casual sex) may influence engagement in hookup culture behaviors, such as alcohol consumption, post-hookup communication, and engagement in hookups. This study hypothesizes that individuals with insecure attachment styles will report engaging in more hookups as well as consuming more alcohol during hookups compared to individuals with a secure attachment style. Data comes from Chapman college students ages 18 and older who were enrolled in an introductory psychology course. Studying hookup culture behaviors such as binge drinking and their predictors of engagement can help young adults understand what may contribute to adverse hookup outcomes, such as feeling regret after a hookup. Significant findings highlight the importance of understanding the complex factors contributing to risky health behaviors among college students and the need for tailored interventions to address these factors. Given the prevalence of engagement in hookup culture, universities should opt to educate students, provide resources, and establish a safe environment for young adults during a time of sexual exploration.

1:00pm-1:15pm

Veterans and Mental Health Services
Presenter(s): Hailey Buitrago
Advisor(s): Dr. Desirée Crèvecoeur-MacPhail

Active duty military members can be subjected to significant amounts of stress, trauma, and physical and mental exhaustion during their service periods. It is vital to recognize the extent of these mental health disorders because they affect 27% of veterans, and when not adequately treated, they can lead to increased functional disability, even more so than physical illnesses (Philips, 2016; Wells et al., 1989). This study aims to examine how different types of information influence the perceptions of therapy for veterans. Veterans of all branches of the United States military between the ages of 18 and 100 were asked to participate in this study. The participants were asked to answer a set of questions regarding perceptions of therapy and were then prompted to watch a video with either a testimonial or information on how therapy can help. After the video, participants were asked to complete a second round of the questions they previously answered. The study intends to find that the presentation of testimonial video intervention will result in a greater increase in the desire to attend therapy than informational video intervention, and the presentation of the informational video intervention will result in a greater change in the perception of therapy than the testimonial video intervention. Furthermore, the study intends to find that female veterans will have a greater change in their desire to attend therapy when compared to male veterans, and lastly, younger veterans will have a greater change in their perception of therapy when compared to older veterans. Currently, mental health disorders lead to 21 veteran suicides every day (Shane, 2016), with many of these veterans not seeking therapy due to their perceptions of therapy. The study's results could lead to changes in how mental health services are perceived, thereby increasing the likelihood that veterans will attend therapy, which would lead to reduced suicides and other negative mental health outcomes.

1:15pm-1:30pm

Assessing Differences in Opinions and Attitudes Surrounding Psilocybin as a Treatment for Mental Health Disorders
Presenter(s): Onjolie Silva-Padovan
Advisor(s): Dr. Desirée Crèvecoeur-MacPhail

As mental health continues to be a prevalent issue throughout the world, innovative medical treatments are of top priority. There has recently been a fascinating new wave of research surrounding the promising therapeutic uses of psilocybin (magic mushrooms) as a treatment for depression. With the history of psilocybin being widely known as an illicit or dangerous substance, public opinion on psilocybin is important when considering patient acceptance and education of the treatment. This research study aimed to assess the differences in opinions and attitudes surrounding psilocybin as a treatment for mental health disorders. This study was a single condition survey design where Chapman student participants received the same survey. It was expected that participants with depression or treatment resistant depression who have received treatment would have more positive views on psilocybin as a new treatment. The literature indicates a lack of efficacy with traditional antidepressants, and these results additionally indicate a need for a massive restructuring of mental health services and a reevaluation of antidepressants as the mainstream treatment method. Additionally, after analyzing general opinion on psilocybin as a treatment method, it is important for medical professionals to accurately educate the public on the usage of psilocybin as it becomes a more mainstream method of treatment. As public opinion on psilocybin changes, this will pave the way for new and innovative research on depression that could change the way we treat depression and improve patient outcomes around the world.

AF 209B

Electrical Engineering

12:30pm-12:45pm

Nanophotonic Devices for Information Processing
Presenter(s): Kyle Wynne
Advisor(s): Dr. Mark Harrison

Computing within communications networks is almost entirely supported by designs using electrons, even though transmission is typically done with photons. Photonic devices integrated onto silicon wafers are already used in networking applications mostly related to transferring data. If we can create devices for computing that data, we could process the data more efficiently and remove the need for translation between electrical signals and optical signals. One of the main challenges involved with photonic computing devices is signal degradation. When traveling over long distances an optical signal can become noisy, lose power, and become weaker. We are exploring the use of nonlinear optics to remedy this problem. Nonlinear optics is a branch of optics that deals with mixing different wavelengths of light in

nonlinear mediums to generate different effects. There are many different types of nonlinear materials, but we settled on using epsilon near-zero (ENZ) materials that exhibit nonlinear behavior at a crossing wavelength where the permittivity goes through zero, changing from positive to negative. To better understand the behavior of these materials before they are integrated into a chip, we must experiment and verify that a near-zero wavelength can be identified and quantify how the nonlinear behavior changes with different wavelengths around the near-zero wavelength. The ENZ material Indium Tin Oxide (ITO) was used for these experiments because it is cheap, easy to manufacture, and is already used in commercial technologies. By using a sample of ITO with a near-zero wavelength of around 1280nm, we were able to generate nonlinearities and data to support the idea that nonlinearities occurred at a higher efficiency when closer to the near-zero wavelength. With this being verified, we can now start working on the signal regeneration process.

Film

12:45pm-1:00pm

Loyalty, Honor and Betrayal: Masculinity in the Heroic Bloodshed Film
Presenter(s): Will Singer
Advisor(s): Dr. Jan Osborn

In the current era of Hollywood, superhero action films dominate the box office. Recently, the characters have come under fire, with maverick filmmaker James Cameron claiming that they “all act like they are in college.” Thor, the only character to have four standalone movies, represents the worst of these issues. He is violent, dominant, emotionally closed off, treated like a joke, and his image perpetuates unrealistic body standards. This begs the question: what is a better representation of masculinity in the action genre? Hong Kong films released between the ‘70s and ‘90s offer a better example, with the melodramatic approach showcasing brotherhood as messy and emotional. Starting at the beginning with A Better Tomorrow (1986), the law is blurred to show the complexity of the relationships between the characters, in particular the criminal protagonist and his police officer brother. Instead of bantering like the Avengers, the characters in these films hug, cry and even tickle each other. Unfortunately, increasing strictness in censorship standards have hindered the Hong Kong film industry since the city was handed back to China in 1997. With Raging Fire (2021), the genre reflects a lack of complexity as a cop and his former protégée, now a criminal, are pitted against each other in a duel to the death. The black and white morality of the law versus the lawbreakers found in the genre is now more in line with Hollywood’s films, but the films still exist to remind the audiences of a more positive representation of masculinity in the action genre.

Peace Studies

1:00pm-1:15pm

Envisioning and Unifying A Sovereign Hawai'i
Presenter(s): Kawai Kapuni
Advisor(s): Dr. Lisa Leitz

Hawai‘i has faced a century-long battle over statehood within the United States (U.S.), and many seek for Hawai'i to regain its status as an independent, sovereign nation. Beginning with the arrival of missionaries and Anglo-Saxon capitalists that catalyzed the overthrow and annexation of Hawai’i in 1893, to statehood in 1959, U.S. colonization and imperialism have resulted in "a society in which the indigenous culture and people have been murdered, suppressed, or marginalized for the benefit of settlers who now dominate [Hawai'i]" (Trask 1999). In 1960, precisely one year after statehood, one of the most robust and instrumental forms of civil resistance in Hawai‘i would begin. Coined the Hawaiian Sovereignty Movement, "Native Hawaiians banded together to campaign for Hawai‘i’s reestablishment as an independent nation, calling for the human right to self-determination" (Trask 1999). However, this movement has seen a decrease in long-term and effective mobilization and has splintered. Whereas sovereignty has remained a core issue and concept within Hawai‘i‘s community, it has also taken on myriad interpretations. This research examines these differing interpretations and whether these have acted as an inhibitor to the mobilization and unification of the overall movement. Using publicly available media, academic, and archival materials, as well as a snowball interview technique of key leaders and participants in the movement, I will identify the timing of these definitions of sovereignty arising and how activists felt about these differences. Overall, this research will clarify whether and how different interpretations of sovereignty led to the decrease in long-term and effective mobilization and unification of the Hawaiian Sovereignty Movement. In addition, the results may provide potential ideas as to how the Native Hawaiian community can increasingly mobilize and unify the Hawaiian Sovereignty movement.

Religious Studies

1:15pm-1:30pm

A Brief Analysis of Contemporary Confucianism's Research on Feminine Topics
Presenter(s): Jingzhi Pan
Advisor(s): Dr. Nancy Martin

Although Confucianism has been recognized as a world religion for more than a hundred years today, recent research, which studies it as a religion, still seems numbed to or ignores day-to-day feminine topics like sexual crimes, domestic violence, male patronize, and even gendered religious value itself. More often, even if they announce they are studying the religion, people study Confucianism as a philosophy, an ethic, a phenomenon, a political strategy…everything else but a religion with transcendent values like other world religions. This essay will overview the research of contemporary Confucian feminine topics and analyze and argue their utilities in helping Confucian women.

AF 209A

Psychology

2:00pm-2:15pm

Let's Talk About Sex, Baby: How People Who Date Women Differ In Desires Towards Women Breaking Relationship Norms
Presenter(s): Emily Foster
Advisor(s): Dr. Amy Moors, Dr. Desiree Crevecoeur-MacPhail

Over the past few decades, there have been shifts in people's values toward traditional relationships and dating norms (Klein et al., 2019). As such, the reasons why people engage in relationships (including what people look for in partners) have also changed with time. However, there is often a heteronormative perspective when looking at gender roles and norms for dating, and little research has focused on the perspective of sexual minorities (Kowalski & Scheitle, 2020). The present study examined single people's attitudes toward dating and what they seek in a partner collected as part of The Kinsey Institute's annual Singles in America project data from 2021. Using a nationally representative sample of currently single people in the U.S. (N = 5,000, average age of 45.68 years old), this study investigates how people who date women perceive the importance of their partner adhering to or violating gendered dating norms associated with women in U.S. society. Specifically, we examined the importance of desiring a partner who wants traditional relationship milestones, such as marriage or children; and desiring a partner who breaks a scripted "submissive" role to be assertive about their wants and needs. To examine this, the study analyzed survey responses of heterosexual men (N = 1,614), bisexual men (N = 71), bisexual women (N = 204), and lesbian women (N = 143) (i.e., people that date women). Drawing on the Sexual Scripts Theory, we expect that lesbian women are more accepting of women who do not want traditional relationship milestones than heterosexual men. In contrast, bisexual men and women will be more likely to want traditional relationship milestones than lesbian women. Additionally, bisexual and lesbian women will be more accepting of assertive women compared to heterosexual men, but bisexual men will be more open to this than women who date women. Results will help understand sexual minorities' perceptions of gender roles and any shifts in partner or relationship preferences.

2:15pm-2:30pm

The Influence of a Roommate's Body Talk on One's Body Image
Presenter(s): Sharon Cohen
Advisor(s): Dr. David Frederick, Dr. Desiree Crevecoeur-MacPhail

The tripartite social influence model proposes that parents, peers, and media play a role in shaping body dissatisfaction. In many studies, the definition of peers is vague, and this study examines one type of peer: a roommate. This study drew on 188 college students and examined their perceptions of how roommates impact their eating behaviors, clothing, and body satisfaction. Due to social comparison theory, it was

predicted that body talk and discussions about dieting, clothing, make-up, exercise, and other strategies for modifying appearance would play a more significant role in one's body image. The survey included a modified version of the peer pressure subscale of the Social Attitudes Towards Appearance Questionnaire-4, new items created for this study, and validated measures of body dissatisfaction and preoccupation with weight. About 1/4th of the participants reported that their roommates negatively impacted their eating behaviors. Only about 1/10th reported negative impacts on their feelings about their overall appearance. People who felt more appearance pressures from their roommates reported more fixation with their weights (r=.383), a stronger drive to look thin (r=.603), and less satisfaction with their appearances. This study highlights the importance of further examining how college roommates may influence one's body image.

2:30pm-2:45pm

Parenting Styles on Adults' Coping Skills, Openness and Interpersonal Closeness
Presenter(s): Kylie Mullenex
Advisor(s): Dr. Desiree Crevecoeur-MacPhail

We often say that people are the product of their parents. This little phrase highlights the significant impact that parents have on their children. Data collected in the U.S highlights that 46% of parents use the authoritative parenting style. Previous research has examined the connection between parenting styles, the majority of the research focusing on authoritative and authoritarian parenting styles, and its influence on personal development. The current study examined the relationship between perceived parenting styles, effective coping skills, interpersonal closeness, and personality development. This survey research study consisted of participants from Chapman University. Expected results indicate that authoritative parenting leads to increased effective coping skills, higher interpersonal closeness and more openness personality traits. In addition mothers use more authoritative parenting styles in comparison to other primary caregivers. Significant results will indicate that parenting classes and instruction should focus on authoritative parenting. This focus will benefit children resulting in increased effective coping skills, higher interpersonal closeness and more openness personality traits. Authoritarian parenting should no longer be seen as an effective parenting style and replacing it with authoritative techniques will result in grand improvements in the well being of society.

2:45pm-3:00pm

The Influence of Social Identity on Fear of Mass Shootings
Presenter(s): Stephanie Yanes
Advisor(s): Dr. Desiree Crevecoeur-MacPhail

In the past year alone, at least 609 mass shootings have occurred (A partial list of mass shootings in the United States in 2022, 2022). Given this looming total, this study built upon Social Identity Theory to examine the relationship between an individual's fear of mass shootings and elements of their identity, such as the social categorizations of race, political affiliation, and age. Additionally, the study explored how an individual's fear influenced their psychological well-being. Among the different tests utilized, the results

revealed the importance an individual's identity plays in their fear and how this fear can create future consequences for an individual's psychological well-being. If consistent with the hypotheses, the results would reveal a statistically significant relationship between fear of mass shootings and multiple identity factors, including race, political affiliation, and age. With the consistency with which mass shootings continue to transpire, this study serves as a valuable and essential step to eliminate the polarized nature of gun control debate. Most importantly, this study will help to inform effective policy to address the often invisible consequences left behind by such mass tragedies.

AF 209B

Political Science

2:00pm-2:15pm

The Role of Group Identity and Group Membership on Acceptance of Political Violence in the United States
Presenter(s): Aarushi Bhaskaran
Advisor(s): Dr. David Shafie

Rising rates of political violence and extremist ideology in the United States, especially related to identity politics in the form of hate crimes, has led to a need to understand what factors influence an acceptance of violence in the American population. This study aims to gain an understanding of the relationship group identity and membership to acceptance of political violence in the United States. Existing research on political violence includes conversations around the impact of rhetoric (particularly analysis of former President Donald Trump's rhetoric as it relates to American acceptance of extremism and violence), across party lines, in relation to the COVID-19 pandemic, tied to media consumption habits, and in relation to specific ethnic, racial, or religious groups. The objective of this research is to gain a coherent understanding of Americans' acceptance of political violence across various groups, emphasizing the strength of group identification. Which groups are most prone to accept political violence? How strongly held are these beliefs? How does strength of group identity impact the former questions? In this research, party identification and partisan strength, racial and ethnic identity, feminist/anti-feminist identity, and religious affiliation, with strength of each identity, is explored. To include an intersectional approach to feminist identity, variables related to respondents' stances on transgender and gay issues will also be included. This paper employs data from the 2020 American National Elections Studies (ANES) and uses regression analysis and other tools of statistical analysis to add to the discourse on this topic and to further theoretical understandings of the role of group identity and membership on United States politics.

Theatre

2:15pm-2:30pm

If It Merely Lasts a Second: A Concert Cabaret Revue of Broadway's Musical Flops
Presenter(s): Michael Miller
Advisor(s): Dr. Jocelyn Buckner

In 2021, I undertook a project where I listened to every single musical produced on Broadway since 1950. That was two musicals a day, for a total of roughly 750 shows (the actual number of musicals that fit these constraints is slightly higher, but unfortunately some of those were completely lost to time, and were unable to be consumed in any form). With such a huge library of musicals, it's no wonder some of them get lost to time, but it is curious thinking about why certain shows stay in the public consciousness and are seen as important pieces in the Broadway canon, while others - no matter the brilliance - get overlooked and forgotten. I want to shine a light on some of these lesser known shows. Some have something to say about current society, or provide a fantastic audition song, or just have funny anecdotes attached to them. Listening to so many shows in succession - and in chronological order, no less - clued me in to wider trends, the topics and messages that seemed to be resonating with people - or, at least, the shows that producers thought were worth producing, and the shows that composers and playwrights thought were worth creating. It's interesting to speculate on why they failed, or became obscured - perhaps it was because the producers ran out of money, or the show was ahead of its time, too behind in the times, patently offensive, marketed incorrectly, simply too long and dull. By the creation of a concert cabaret, I'd like to illuminate all of the various aspects of why a show flops, the behind-the-curtain secrets, and discuss some of Broadway's best, worst, and weirdest hidden treasures.

English

2:30pm-2:45pm

Redefining Storytelling
Presenter(s): Jordan Beal, Evan Fenley, Court Jeffries, Fiona Bumgarner
Advisor(s): Dr. Glenn Kurtz, Dr. Jan Osborn

All art forms have genres, a type of classification that focuses on shared components of the form. And in any art form/genre, there exists a tension between free expression and convention. The conventions impose limits – both conceptual and expressive – on the creative product, creating a tension between the conventions and creation. In an attempt to determine how genre works and how there can be creative change within a genre, in the Make It New: The Practice of Creative Thinking Workshop, we participated in a series of guided exercises that challenged us to look at "What makes a story a story?" Following a series of guided exercises, we challenged our conceptions – the fundamental assumptions – regarding stories. Once we identified the essential components of a story, we imagined how a story might work

without an essential element or two. We created a story without the structural elements of a beginning, middle, and end; and then, we decided to do away with words as well. From there, we redefined what a book is by creating a book as a three-dimensional cube. Our work redefining storytelling focused on contributing to literacy. The cube – a book for reading – would require the reader to put the beginning, middle, and end – plus the words – back into storytelling. By designing a new way to tell stories, we have found that everyone who picks up our book creates a different story. In this presentation, we will describe the process that led to a book without a beginning, middle, end, or words; and we will ask our audience members to read the book as they participate in the symposium.

AF 209A

Psychology

3:30pm-3:45pm

Humor Styles and Their Effects on Controversial Jokes
Presenter(s): Emma Holland
Advisor(s): Dr. Desiree Crevecoeur-MacPhail

The normalization of controversial humor has affected how various people, depending on their demographics and humor styles, find various controversial jokes humorous. People have different humorous beliefs and views on the world. This study examined the relationship between humor styles, demographics, and controversial jokes. By utilizing surveys and controversial jokes with questions for participants regarding if they found them humorous and/or controversial, this study predicted that participants with different demographics and humor styles will find controversial humor more humorous. It was expected that all the hypotheses will be supported. These results may show how normalization and desensitization to serious topics, especially in the form of humor, can negatively impact society. Though people have learned to cope by using these jokes and are able to talk about serious topics in a lighthearted tone, with certain topics, these jokes become harmful. With society widely accepting and normalizing controversial jokes, this can continue to promote and increase offensiveness and discrimination as people often make jokes about others. This study can guide people to recognize that these jokes that are common in one's everyday life are producing more harm than good and can re-evaluate their humor style and find different sources for their humor.

3:45pm-4:00pm

Microaggressions Versus Blatant Discrimination and Their Effects on Mental Health
Presenter(s): Ian Lock
Advisor(s): Dr. Desiree Crevecoeur-MacPhail

This study examined the relationship between types of discrimination and its effect on mental health. Specifically, comparing microaggressions and blatant discrimination to see which variable had a significant impact on depression and anxiety. Microaggressions, derogatory slights/insults directed at members of an oppressed group, are a primary focus for researchers looking at racial discrimination. The impact of microaggressions is prevalent across a myriad of different marginalized groups such as people of color, women, and the LGBTQ+ community. Microaggressions have a large negative impact on mental and physical well-being in individuals, with research finding that it has a negative impact on symptoms related to anxiety, depression, self-esteem, and behavior. Results are expected to find a consistent relationship between higher levels of anxiety/depression when more experiences of microaggressions/blatant discrimination were reported. Specifically, those who had more experiences with blatant discrimination would suffer from higher levels of depression, whereas those who experienced a higher number of

microaggressions would suffer higher levels of anxiety. The results of this study will help to inform individuals on the respective effects of microaggressions and blatant discrimination on mental health. Mental health professionals can use this information to further race-related research, being able to incorporate these results into their work, in order to individualize the way they interact with patients from marginalized groups. More importantly, this research will shed light on the experiences of marginalized individuals and allow them to feel more comfortable sharing their stories publicly.

4:00pm-4:15pm

Conforming and Rebelling of Gender Roles
Presenter(s): Tanner Rubin
Advisor(s): Dr. Desiree Crevecoeur-MacPhail

This study, built upon gender schema theory, examines the relationship between an individual's knowledge of gender roles and how these created schemas shape one's behavior. Furthermore, the study explored how individuals adjust their behavior to align themselves with the cultural gender norms within which they have been emersed, starting from their earliest stages of development. This study examined the associations we know as the concepts of "maleness" and "femaleness. The results of this study indicated that individuals who have grown up within an environment supporting preconceived gender roles are more likely to adopt the normalized behavior specified for that of a specific gender. These results can be witnessed within everyday life as women are typically expected to dress feminine, adding to a polite and nurturing attitude. In contrast, men are generally expected to adhere to a much bold and more aggressive manner of conducting their lives. Constant conforming to societies' stipulated gender roles has led to an increased level of depression. The inability of individuals to be able to generate differences between men and women involving gender-characterized separation has created a discrepancy interrupting the natural flow of one's individuality. Our environment's disparity ultimately determines whether gender roles are met or rebelled.

4:15pm-4:30pm

Long-Term Influence of Parenting on Disordered Eating and Body Perception
Presenter(s): Maggie Smith
Advisor(s): Dr. Desiree Crevecoeur-MacPhail

Eating disorders are among the most deadly psychiatric disorders. Relationships such as friends, parents, siblings, and media have all been previously analyzed regarding their effects on one's development of disordered eating behaviors and negative body perception. Specifically in studies focusing on parental influences, the majority of those included subjects who were in their childhood and adolescence, and very few observed long-term effects in adulthood. In addition, the majority of previously conducted studies investigated the mother-daughter relationship and did not include data on males. The present study worked to further examine these previously neglected variables, by gathering data from college-aged students above the age of eighteen and of all genders. Data was gathered through an online survey including the use of multiple well-tested instruments. This study hypothesized that coercive food control

practices, maternal disordered eating behaviors, use of food as behavioral rewards, and frequency of family meals would all affect the subject's disordered eating behaviors. The results of this study will provide important information for the prevention of disordered eating behaviors in adulthood by giving insight into harmful parenting techniques and relationships that are positively associated with such behaviors. This study will aid in the development of positive parenting practices concerning feeding, and contribute to the decrease in eating disorder diagnoses.

AF 209C

Tunnel Vision
Presenter(s): Reese Paddock
Advisor(s): Micol Hebron

Tunnel Vision, a narrative work addressing simulacra and reality within the Internet, provides imagery of how the Internet affects identity, mental status, and time. The Internet supports global inclusivity and communication, however, it proposes severe effects on our individual identity, mental status, and time continuum. The Internet has become a platform where anyone can create an ideal identity or environment; however, it comes at the cost of our persona. Furthermore, "Tunnel Vision'' provides direct commentary on how we have become the Internet, yet the Internet is a product of society. I used cultural connotations and symbolism to target identity, time, and mental status ideologies. The red, headless figures represent society and our psychological endeavors. I decided to keep these figures red to create a sense of segregation within the image. In addition, the Internet figure is black and white and drastically warped to highlight its non-human form and leeching function, yet, the figure is still human because we are the sole contributors to the Internet. Moreover the figure is attached to a TV, insinuating that the figure and Internet are one function and form. Furthermore, I reflected the figure over most of the image to show how prominent the Internet is, and how it holds space within our daily lives. We use the Internet to escape reality, and typically, we hyper fixate or have tunnel vision when surfing the Internet.

Uncanny Evolution
Presenter(s): Will Baca
Advisor(s): Micol Hebron

I like to think about reality and simulacra in the internet age as then and now. Then being everything before a conscious awakening and now being anything between consciousness and reading this. The image is an arranged landscape divided into thirds from right to left, similar to a timeline. I tried my best not to use square images, cutting out only the important objects or symbols. My image uses little to no negative space, somewhat of a sensory overload. All the images are different sizes and I used layer arrangement to embed smaller objects into any negative space. From the left, the image is very warm and almost soft. The middle has much sharper edges, and texture and all the images are black and white. Off on the right of the image, things are much brighter with a mixture of textures. Using more layering techniques I recreated an uncanny image we see daily.
I had some ideas like looking at how art and communication have evolved over time. Like, Elliott Hundley, I want to make an abstract collage similar to his with lots of little embedded things in the large space. Using symbols that are nostalgic and familiar to represent a timeline of how art and communication have evolved. In a larger context, this piece touches on the changes in what colors are chosen and how we used only natural pigments but now we have simulated chemical colors. The form relates to reading the piece right to left like a timeline, and the content is grouped by different eras in human history to help present an evolution. I am choosing images based on representations of different eras in society, things like the pyramids for ancient life and Snapchat for the present day. I encourage the viewer to engage with the collage, drawing connections between the various images.

Opportunities
Presenter(s): Johannah Choi
Advisor(s): Micol Hebron

For this project, I wanted to showcase the many window of opportunities Chapman has provided me with. Now being a senior and getting ready to graduate in three months, I've been doing a lot more self reflecting recently. This project has allowed me to realize how many amazing, great things have happened to me over the years. I know my past self would be proud of who I've become today. I'm currently nervous, yet excited for what the future holds; however, I know it'll be good. Through all of this, I wanted to tell others about how my life journey has helped me learn the significance of loving life. I am forever grateful for the opportunities Chapman has given me and the people who have supported me.

Blissful Unawareness
Presenter(s): Anders Little
Advisor(s): Micol Hebron

One of the main points I wanted to convey was the contrast between the person and the world outside of them. I wanted the person and the house to have a very cheerful and oblivious feel while the natural world has a dreary and dystopian atmosphere. I wanted this separation to show how humans are responsible for how quickly climate change has impacted the world, but most people are not changing their habits because they do not feel personally affected by the changes. I chose images of deforestation and animals like polar bears and bees because they are just a few of the things that have been impacted by climate change. Changes in weather and climate have affected habitats and human impact has affected the population size of animals. Because of increased demand for products, deforestation has become more prevalent. For the photos of the natural world, I looked for photos that had a melancholic feel and a dull color palette to emote how dreary climate change is. Alternatively, for the house and person, I specifically wanted brighter colors and vibrancy to emote positivity and contrast the background. I picked a photo of a person smiling to convey a happy emotion.

Runaway
Presenter(s): Cameryn Krauss
Advisor(s): Micol Hebron

Runaway is a narrative collage that comments on the long standing issues regarding the progressing climate crisis and the complacency of humans. Runaway is separated into three corresponding sections, the background, middleground and foreground. This allows greater depth to the piece as well as adding a level of complexity. Many of the elements within the piece fall within the rule of thirds, creating a visually aesthetic look.
At first glance runaway should seem overwhelming and confusing. As the viewer continues to look, the meaning will start to reveal itself. Many elements of the piece are exaggerated in order to achieve this effect. The saturation of the entire piece is very high in order to optimize the vibrance. By doing this the

nature scene becomes unrecognizable and distorted. The distortion of the nature scene is representative of the damage that the ongoing climate crisis has caused to the natural world. The artificial feeling connects to the production of man made objects that seem to have taken over the world. This message is also portrayed through the trees made out of nuts, bolts, and wrenches. The sectioning of the piece is one of the most notable and meaningful. The division of the background middleground and foreground connects to the history of the climate crisis regarding its past, present and future. The background represents the past, the natural world, pure of pollution and machinery created by humans. The middle ground symbolizes the destruction of this through the imagery of the chopped down trees. The metal trees and distorted hands represent the future. It displays the uncertainty of the future as well as the excessive use of man made material. The window is a metaphor for the current inability to view and change our actions. The window only exists in the future where the human looks back on the affects, changes and damages that humankind has caused towards the environment. The human in the future behind the window longs for the natural world we once maintained and can now understand the danger and harm we have caused.

I Love My Art and My Art Loves Me
Presenter(s): Magdalena Alexander
Advisor(s): Micol Hebron

The meaning of my piece comes from the Greek Myth of Pygmalion and Galatea. Pygmalion had a great passion for sculpting, and one day he created a sculpture so beautiful he fell in love with it. Impressed and honored by his deep love for his sculpture, the goddess of love Aphrodite decided to turn his ivory sculpture into a real woman for him to love eternally forever named Galatea. I wanted to reclaim the misogynistic parts of this story by turning myself, a woman, into Pygmalion. I have always been drawn to this story because I believe that it can represent a love for your art so deep that it is personified in your mind. In the story, Pygmalion loves his sculpture so much that it is all he looks forward to all day, coming home and embracing it. I constantly feel so consumed by my art that I sometimes feel as though I am in almost a toxic relationship with it, which is why I wanted to become Pygmalion in this. It also works out that I am a ceramicist and he is a sculptor. In the middle ground, I included real pieces that I have made and in the painting on the wall I included a photo of me selling my art, and of me next to a giant vase I made last semester, which I consider to be my hardest and most effort/time consuming project to date. This idea is encapsulated by the text at the top of the piece, reading “Your Art Consumes You Whole.” I also expressed this in the title of the piece as well. Pygmalion’s piece came to life and loved him back, and even though mine do not do that, I put so much effort and time into them that when they are finished it exudes in me a feeling of deep adoration that I could compare to that of a companion.

Self-Portraiture Through Cultural Narrative, Personal History, and Folklore
Presenter(s): Daniel Purtell
Advisor(s): Micol Hebron

I call Huntington Beach my home. The first place that comes to mind when I think of home is the HB Pier, where I have spent years playing volleyball with family and friends and swimming in the refreshing

Pacific Ocean. This image of my home contains images that have shaped me as a child and images that have shaped me during my years of becoming independent. The color green is a symbol of resilience, youth, health and optimism. The images that have a green tint represent the symbolic meaning of green in my life. My family, dog, and the traveling experiences that my family blessed me with, were all out of my hands, meaning that the person I was during that time was shaped by the forces around me. The color purple is associated with wisdom, creativity and independence. The images with a purple tint foundate the symbolic meaning of purple in my life. My friends, the music I listen to, and volleyball are all important and enjoyable aspects of my life where I have been able to independently make decisions and grow into a distinguished person. Both the green and purple images are equally important in terms of putting together who I am, and both of them are blessings. The phrases on the collage are from two songs I like from two different artists. These artists were favorites of mine during two different periods of my life, each with very different mental states yet similar mindsets. The music artists in my collage are Machine Gun Kelly and Zach Bryan. Encompassing the entire college is a piece of my life that is always a part of me, but an unknown part of me. I'm adopted and my birth mom (17 at the time) left me a journal during her pregnancy. I've never met her and all I know about her is the words she left me. I think that the composition of these almost unreadable, faded words in the background are a good way of showing how my biological mom is present yet unknown in my life.

How Many in Your Party?
Presenter(s): Amanda Stein-Sigal
Advisor(s): Micol Hebron

How many in your party? was created to represent climate change and how climate change is causing extinction of animals. The three animals I use, polar bears, African elephants, and honeybees, are all animals that can be found on the endangered species list, and like the honeybees, the species may be on the verge of extinction. The background is a literal visual of how there used to be more icebergs which have begun to melt, and how more wildfires are occurring due to climate change. The tables are divided into three sections, shown better by affiliation with the iceberg to ocean to wildfire behind them. The section on the left shows tables that are full and have multiple animals sitting together. This represents the past when the animals were thriving and had no additional concerns to their natural lives. The middle section shows that there are only one or two animals sitting at the tables. This represents the present day when these animals and their environments have been negatively affected by climate change and are now endangered species. The tables on the right side of the collage represent a possible future where humans fail to find a way to protect nature, causing animals to have gone extinct. I wanted the tables to be set up and resemble the layout of tables in a restaurant. This decision is also what inspired the name of the collage, when a host at a restaurant asks how many people are in your party in order to know how many people to seat at the table.

AF 209C

Human Nature
Presenter(s): Emily Paris
Advisor(s): Micol Hebron

For my narrative collage, I chose the topic of life in the time of the climate crisis and the Anthropocene. When we are endangering the planet, we are ultimately endangering ourselves. The photo of the girls' faces shows the vulnerability and stoic pain that we all deep down feel in this current age of impending environmental doom. The boys seem to display similar feelings but in a different time period (the start of this mass production and pollution; the Industrial Revolution). The colored elements and objects in contrast to the black and white images are to show what we are currently being shown today through the media, our own experiences, and conversations with others. The dying polar bears, the polluted waters, and forest fires. On the other hand, I also wanted the colored elements with the shadowed photos and the dancing girls on earth to be glimpses of hope for a better and cleaner future.The girls dancing on earth are to give a positive perspective on what life could look like; simply enjoying and loving Earth as an action for positive change. Living alongside Mother Nature and nurturing her, just as she does us. We have the power to make a change to create a more hopeful and healthy future. It is in our human nature to do so. That's what I believe and want to convey through this piece.

Hidden Emotion, Masked Identity
Presenter(s): Isabelle Morr
Advisor(s): Micol Hebron

For my collage topic, I chose self-portraiture through cultural narrative, personal history, and folklore. I started off with a landscape background and I wanted a lot of it to be displayed throughout my piece, since it is part of the message. I was aiming for an abstract aesthetic with a real-world meaning and nature-like appearance. A lot of work was done with opacity, blurring photos, cropping, and liquifying. I also played around with the contrast and brightness, filters, and the distort tool. The goal for me was not to crowd the background with objects, but instead I placed images with lots of detail on top of a basic landscape. I included aspects of narcissism, 2-faced emotions, and the development of self-portraiture throughout the centuries. The concept of trying to hide our inner emotions with our outward appearance was also an important factor of this piece.

Inner Nature
Presenter(s): Hannah Emerson
Advisor(s): Micol Hebron

Inner Nature is a digital collage that explores the evolution of the relationship between humans and nature over the course of one's life and how the Internet affects it. This collage has three separate sections that represent different stages of life and flow together with the use of the landscape to tie all of the elements together. The left side represents when people are young and often spend more time outside playing due to having mandated times to do so and not having as much access to the Internet. This is represented with various imagery of kids playing in the grass and on the top of the hills. The

middle showcases a path with two people, one on their phone and one immersed in the environment that surrounds them. This represents the time in many people's lives where they start having more access to the Internet with their own phones or other devices and begin to have more of a choice with what they do in their free time. With this choice, many people end up not prioritizing spending time outside. Lastly, the right represents people choosing to spend more time inside surrounded by objects that resemble different aspects of the outdoors, like lamps, plants, and simulator games. Although the outdoors is still present, as shown through the curtains, many people over time begin to prefer this over spending time amongst real aspects of nature. Overall, Inner Nature showcases a gradual pull away from the outdoors in one's life, inspired by my own experiences, and utilizes different Photoshop tools and filters to achieve the final product.

Metamorphasis
Presenter(s): Olivia San Jose
Advisor(s): Micol Hebron

I chose to portray self-portraiture through cultural narrative, personal history, and folklore. The assets I gathered include pictures of the seasons, pictures of me as a child, stages of a butterfly, paintings I created in high school, pictures of my grandmother, and pictures and the types of women I used to want to embody. I wanted this work to encapsulate a portrait of metamorphosis from child to adolescent to emerging adult. I incorporated seasonal landscapes I've photographed as a representation of mental states. The snowy, bleak, icy, Chicago winter landscape which lines the bottom background reminds me of what it felt like to be an adolescent. I am in this photo of lake Michigan looking out as a fence overlaps me. When this picture was taken I was struggling with my mental health. It was uncomfortable and cold, hopeless, lonely, and seemingly endless, just like a wintery Lake Michigan. This period of depression also translates to a butterfly in its cocoon waiting for the right time to emerge. The way I arranged the butterfly stages and the seasons in the window in no particular order was intentional to emphasize how growth, change, and cycles are not always linear but can seemingly jump from one stage to the next.
I pasted faces of me as a child onto the bodies of sexualized, conventionally attractive women. I wanted this to be provocative and feel uncomfortable to look at. The adult bodies with a child's face represent the pressure I felt to be sexy and desirable from such a young age. In commercials, movies, magazine covers, and billboards we see women being presented in infantilized ways, implying that a beautiful woman never leaves girlhood behind, she must always strive to look young. This innocence that is so coveted, is heavily and bizarrely associated with sexuality. The relationship between youth and sex appeal is another way to code female sexuality as submissive, powerless, and dependent. And we are told that this is the nature of being a woman.

Artificial Self-Image
Presenter(s): Sydney Carson
Advisor(s): Micol Hebron

As our society and culture evolve into a digital world, what happens to our self-image? We've seen beauty standards change all throughout history, but, what happens after we have completely digitized

our standards of beauty in this modern day of artificial intelligence? This piece explores the evolution of one's self-image when one interacts with the digital world. Social media being introduced to children as young as elementary school students is all fun and games in the beginning; A form of entertainment. I used photos of myself from my childhood to symbolize the playfulness and innocence of children interacting with social media. However, when a child is consumed by social media throughout their life they are told they don't know anything about the real world. The images of scary mouths are used to symbolize the "boomers" and the "haters" in this piece because Gen Z is constantly shamed for the very culture they didn't create they were just born into. As a 2000 baby, I consider myself to be a "cusper" and I often find myself wondering, what is the real world? Who am I without my Instagram followers? And as the digital world continues to expand I am highly cautious of adolescents tying their self-worth to social media simply because it is the only world they know. And, now, as we step into the world of AI having mastered image manipulation, we are stepping into a digital world that feels a little too realistic to the point where we question the authenticity of every image we see. The impact this has on a child's self-image is immeasurable. I used the contrast of the real film photos against the AI-generated images to show how artificial our self-image can become when growing up under these conditions. Overall, this piece should provoke thought and force you to look deeper into all of the layers of the digital world we live in today and ask yourself, who would I be without social media?

Daydream
Presenter(s): Alex Wolf
Advisor(s): Micol Hebron

I have always felt that this dream-like feeling is something I strongly resonate with in my own personal identity. As someone who was diagnosed with ADHD in kindergarten it has played a big role in shaping my life, because of this I have always struggled with certain symptoms as a result such as extreme anxiety, depression, constant daydreaming, and a constant feeling of nostalgia longing for the past. It was really important to me to effectively illustrate my personal history of dark nostalgia and daydreams.

Graduate Students

Undergraduate Students

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O