STUDENT SCHOLAR SYMPOSIUM

SPRING SESSION

May 5-6, 2022

ABSTRACT VOLUME

CHAPMAN UNIVERSITY

Center for Undergraduate Excellence

Message from the Director

Greetings and welcome to the Spring 2022 Chapman University Student Scholar Symposium! After holding four virtual Symposiums over the last two years, we are excited to be back in person.

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

Please take some time to stop by and wander through the vast array of student poster presentations, check out the visual and performing art presentations, or attend the oral discussions to discover the kind of work our students are engaged in here at Chapman. 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 of the CUE staff, Lisa Kendrick, Operations Manager, and Jackie Coyne, Administrative Assistant, who have designed, developed, and organized the event. A special thanks to both of them.

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

Enjoy the Symposium!

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

Acknowledgements

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

- Leatherby Libraries

- Phyllis and Ross Escalette Permanent Collection of Art

Schedule of Events

Thursday, May 5

Poster Presentation-Session I – 9:30am-11:00am	Beckman Hall 404
Oral Presentation- Session I- 10:00am-11:00am	AF209ABC
Oral Presentation- Session II- 11:30am-12:30pm	AF209ABC
Visual Arts- Session I- 1:00pm-2:00pm	AF209ABC
Visual Arts- Session II- 2:00pm-3:00pm	AF209ABC
Poster Presentation- Session II- 3:30pm-5:00pm	Beckman Hall 404
Oral Presentation- Session III- 4:00pm-5:00pm	AF209ABC

Friday, May 6

Oral Presentation- Session IV- 8:30am-9:30am	AF209ABC
Performing Arts Session- 9:00am-10:00am	AF119A
Oral Presentation- Session V- 10:00am-11:00am	AF209ABC
Poster Session III- 11:00am-12:30pm	Beckman Hall 404
Oral Presentation- Session VI- 11:30am-12:30pm	AF209ABC

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Biochemistry and Molecular Biology

1. ***Investigating Arginine Methylation of PGC-1α, a Master Metabolic Regulator***
   Presenter(s): Tiffany Lubrino, Poula Mansour, Sidney Briski, Arisbeth Mancilla-Burgos, Joshua Huh
   Advisor(s): Dr. Cecilia Lopez

Peroxisome proliferator-activated receptor γ coactivator 1α (PGC-1α, UniProt Q9UBK2), acts as a transcriptional coactivator capable of regulating metabolic pathways. It has regulatory functions in lipid metabolism, mitochondrial biogenesis, and remodeling of muscle tissue. Thus, PGC-1α has been implicated in diseases such as type 2 diabetes and obesity, cancer, and neurodegenerative diseases such as Parkinson's disease. We set out to investigate the control points of PGC-1α by focusing on one posttranslational modification (PTM) called arginine methylation. Arginine methylation increases the structural diversity of proteins and often plays a role in protein-protein interactions. Studies show that PGC-1α contains arginine residues that are methylated by protein arginine methyltransferase 1 (PRMT1). Since there are other members of the PRMT family, we hypothesize that the methylation of PGC-1α is critical for its role as a master regulator by PRMT7. PRMT7 was used because it is a unique member of the methyltransferase family. Not only is it larger than the rest of the family members, but it is also the only known member of the PRMT family capable of producing only ω-monomethylated arginine (ω-MMA) residues. In addition, it prefers to methylate arginine residues found in RXR motifs (where R represents arginine, X represents any amino acid) surrounded by basic amino acids. PGC-1α contains four RXR, three RXRXR, and one RXRXRXR arginine-rich regions and like PRMT7 functions at temperatures outside of 37˚C. In vitro methylation reactions using purified recombinant mammalian PRMT7 and PGC-1α were performed. Methylation reactions by PRMT7 show that PGC-1α arginine residues R568 and R570 become monomethylated and are temperature dependent. These results elucidate novel posttranslational modifications that may act as control points for the regulation of PGC-1α. We next aim to continue this work by focusing on the significance of monomethylating PGC-1α at arginine residues R568 and R570.

2. ***Temperature Dependence of Lactobacillus helveticus Chlorogenic Acid Esterase Activity***
   Presenter(s): Julia Muniz
   Advisor(s): Dr. Cedric Owens, Christine Lo Verde

Lactobacillus helveticus chlorogenic acid (CGA) esterase is an enzyme that hydrolyzes CGA, a phenolic compound found in many foods, into quinic acid (QA) and caffeic acid (CA). CGA esterase has the potential to be used in industry as a way to eliminate unwanted CGA. This research focuses on how temperature influences the enzyme's stability and activity. Temperature is a key parameter that can change enzymatic rate, oligomerization state, and secondary structure. Kinetic assays reveal that CGA esterase works well at room temperature (20°C) and the enzymatic activity increases slightly as temperature increases. The highest activity of CGA esterase is achieved at ~40°C. However, CGA esterase does not obey typical Arrhenius behavior, since maximal activity was achieved well below the unfolding temperature of 65°C. This means that a process other than unfolding must be occurring above 40°C that limits the enzyme's turnover rate. We hypothesize that above 40°C, the enzyme may be oligomerizing into a less active state since preliminary data showed that the oligomerized esterase is inactive. We will test this hypothesis by determining the temperature dependence of the oligomerization. Once we determine the factors that are responsible for the enzyme's non-Arrhenius behavior, we will engineer the enzyme so that it becomes more active at higher temperatures.

3. ***Development of Fluorescence Assay for Rapid Screening of Esterase Mutants using Crude Lysate***
   Presenter(s): Caroline Monahan, Kelli Omori, Brianna Dinn, Kylie Sacapano, Destiny Ly, Tracie Okumura
   Advisor(s): Dr. Cedric Owens, Christine Lo Verde

Chlorogenic acid esterases are useful enzymes that hydrolyze chlorogenic acid and related compounds. The enzyme can potentially be applied in the food, paper, and biofuels industry. The overall goal of this research project is to engineer chlorogenic acid from Lactobacillus helveticus to be more active. This presentation describes a rapid screen that we developed to quickly determine if an engineered mutant is more active than the wild-type enzyme. Developing such a screen is an important step in enzyme engineering since we will be testing the activity of close to 1000 mutants. Our assay is designed to work with crude protein lysate and bypasses protein purification and uses both absorption and fluorescence spectroscopy. The assay uses the different absorption and fluorescence properties of chlorogenic acid and the hydrolysis products, caffeic and quinic acid. After hydrolysis, the products have a blue shift in their absorption spectrum. Furthermore, the fluorescence intensity decreases and is blue shifted. We further determined that the assay is most sensitive when it is run in 10% glycerol. In sum, the fluorescence assay will allow for a rapid way to screen for different esterase mutants using crude lysate, allowing us to find mutants that will thrive in the industry more efficiently.

4. ***Using Absorbance and Fluorescence to Measure Chlorogenic Acid Esterase Activity***
   Presenter(s): Kellie Omori
   Advisor(s): Dr. Cedric Owens

Chlorogenic acid (CGA) is an antioxidant that is present in large concentrations in many foods. CGA esterases are useful enzymes that hydrolyze CGA into caffeic and quinic acid. Our goal is to use protein engineering to make a highly active CGA esterase for food science and industrial applications. To do this, we identify regions on CGA esterase that are the most flexible and then target these residues for mutagenesis to develop engineered enzymes with higher turnover rate than the wild-type. Because this approach involves creating a rather large number of mutant esterases (>100), it requires a high-throughput activity assay that can quickly screen the activity of many mutants. We present a newly developed absorbance and fluorescence assay that distinguishes CGA from caffeic acid. CGA and caffeic acid are both fluorophores due to the aromatic rings in their structures, but they each absorb light and fluoresce at different wavelengths. Their distinct absorbance and fluorescence properties allow us to characterize the CGA hydrolysis reaction and measure enzyme activity by monitoring CGA depletion and caffeic acid formation. Highly active esterases produce a shift in peak maxima of the signals, indicating CGA breakdown is occurring. The reliability of this screening method was validated by adding wild-type CGA esterases in a reaction with CGA. As expected, we observed a shift in signals on the excitation and emission spectra. We then used this assay to screen the activity of our first mutant (Q202). These experiments demonstrate the functionality and efficiency of the rapid screen, allowing us to perform mutagenesis on the remaining target residues.

5. ***The Application of Artificial Intelligence to Improve Inflammatory Bowel Disease (IBD) Outcomes: A Systematic Review***
   Presenter(s): Andrea Venderby
   Advisor(s): Dr. John Miklavcic

Purpose: To evaluate how the application of artificial intelligence (AI) and machine learning (ML) to gastrointestinal (GI) imaging techniques can improve patient outcomes in inflammatory bowel disease (IBD). Methods: A systematic review was conducted and primary research published between 2013 and 2021 involving the use of AI, ML, and GI imaging (colonoscopy, endoscopy) in IBD was included. Outcomes in published literature included classifying healthy tissue versus IBD, predicting disease activity and phenotype, and distinguishing between ulcerative colitis (UC) and Crohn's disease (CD). The review was conducted using Preferred Reporting Items for Systematic Reviews and Meta-Analyses. Certainty of evidence and bias was assessed with the Grading of Recommendations Assessment, Development, and Evaluation approach. Results: A total of eight studies were included in the review. There was a high certainty of evidence for the involvement of AI in disease activity prediction and classification of CD. There is moderate certainty of evidence for AI involvement in reducing invasive procedures. The use of AI and ML in GI imaging was shown to improve clinical care for patients with IBD by reducing invasive diagnostic methods, improving on the time, cost, and labor associated with these diagnostic methods, increasing diagnosis accuracy, and advancing subtype classification between UC and CD. Conclusion: IBD is a complex disease that has remained a burden in the healthcare field as clinical presentation, etiology, and diagnosis is often unclear. The use of AI with GI imaging shows advancements in IBD classification and diagnosis. Using AI and ML in imaging for patients with IBD is a promising path of investigation to be considered and can potentially improve outcomes in clinical IBD.

Biological Sciences

6. ***Handedness in Hagfish Thread Skein Coiling***
   Presenter(s): Arly Adame
   Advisor(s): Dr. Douglas Fudge, Yu Zeng

Hagfishes are a group of eel-like animals that are known for their secretion of slime when they are disturbed or attacked by predators. Slime glands contain intermediate filament protein threads that are manufactured within specialized gland thread cells. The glands produce two main cell types, gland thread cells, and gland mucous cells. The thread cells are then diluted by the seawater where they uncoil and extend as fibers. The mucus absorbs the water, making the mucous component of the slime. Gland thread cells make the fibrous part of the slime, which deploys as coiled threads known as skeins. The slime threads within skeins exhibit a coiled morphology. While the 3D morphology of thread coiling is known, the origin of the coiling is unknown. The coiling of the thread can be left-handed or right-handed. It is wondered whether there are patterns of skein coiling within individuals and species. One possibility is that the coiling direction is the same in all individuals but varies among species. It is also possible that left- and right-handed coiling is randomly distributed individually, within a species, and among species. In my project, I will measure the handedness of coiling in skeins from numerous individuals from several species of hagfishes. I will do this by observing skeins through a scanning electron microscope (SEM) and using an established protocol of handedness. The results indicated that the 115 skeins examined from Eptatretus stoutii, Eptatretus deani, and Myxine limosa all had a right coiling handedness. More species will be investigated to test whether right-handed coiling is consistent among all species of hagfishes.

7. ***The Effect of Carbon Monoxide on the Mutualistic Interaction Between Rhizobia and Alfalfa***
   Presenter(s): Kevin Nguyen
   Advisor(s): Dr. Hagop Atamian, Dr. Cedric Owens

Nitrogen is a key element in living organisms as it is a building block for DNA and protein, but its most abundant form is atmospheric nitrogen (N2), which is unusable by most organisms. To make use of N2, plants known as legumes partake in a mutualistic interaction with bacteria known as rhizobia that convert N2 into usable forms of nitrogen such as nitrate and ammonia in exchange for food and shelter from the plants within root nodules. This interaction is a possible sustainable alternative to the Haber-Bosch process, which utilizes immense amounts of energy to convert N2. Rhizobia's viability as a sustainable alternative is limited by the presence of carbon monoxide (CO). Within free-living soil bacteria, CO has been shown to inhibit the nitrogenase enzyme responsible for rhizobia's ability to convert N2. However, CO has also been shown to induce secondary roots, which are rhizobia's point of entry into the plant to start the mutualistic interaction. With both positive and negative effects for rhizobia, the implications of increasing CO in a legume's environment were studied, particularly if secondary root growth is induced and whether increased CO would affect rhizobia's ability to convert N2. For this project, two sets of legumes known as alfalfa were grown for one week before being placed in two separate airtight glass containers in which one received high concentrations of CO gas whereas the other received none as a control. After one week of exposure, plants were removed from the glass containers and observed for noticeable differences. The root and shoot length of each plant was also recorded. The results showed that plants in CO performed worse as they had wilted and had shorter root and shoot growth. Future experiments will lower the CO concentration enough to have no visible effect on the plants. This is when the secondary roots will be examined and the inoculation of these roots with rhizobia will be conducted. Plants in CO are expected to have increased secondary root growth and subsequently increased rhizobia productivity via increased root nodules.

Chemistry

8. ***Visual Demonstration of Substituent Effects for Chromium(VI) Alcohol Oxidation***
   Presenter(s): Biyu (Chelsea) Zhao
   Advisor(s): Dr. Allegra Liberman-Martin

Different substituents on a benzene ring can behave as activators or deactivators and direct the rate of the reactions distinctly. In organic chemistry, a visual demonstration can help students understand challenging concepts, such as substituent effects. The oxidation of 1-phenylethanol with chromic acid exhibits an orange color to start with, and as the reaction proceeds, the color of the chromium changes from orange to blue gradually. A video of the reaction was recorded for 1-phenylethanol derivatives with different aromatic substituents, with the color change providing a method to visualize the reaction rate. The oxidation rate for each alcohol was measured through first-order kinetics using UV-visible spectroscopy, and these rate constants were used to construct a Hammett Plot as a quantitative method to evaluate substituent effects.

Computational Science

9. ***The Relationship Between Norepinephrine Neuromodulation and Stability of Global Brain States***
   Presenter(s): Emma Krivoshein
   Advisor(s): Dr. Aaron Schurger

Recent research investigating the neural dynamics of consciousness has emphasized that stability of brain states is important for revealing both the contents and overall level of consciousness (Wang, 2008). However, the underlying neural mechanisms that modulate stability are not well understood (Perl et al., 2020). Norepinephrine, a slow-acting neurotransmitter, modulates the excitability of neural networks and thus may play a role in controlling stability of specific brain states (O'Donnell et al., 2012). Norepinephrine levels can be reliably indexed by pupil diameter because the primary source of norepinephrine, the locus coeruleus, projects directly to the pupil dilator muscles (Joshi et al., 2016). Past studies in this topic have involved correlating neuromodulator activity with tasks, but not many studies have used perturbation of the brain to observe the effects of neuromodulation on stability. In this study, we perturbed the brain at resting state with transcranial magnetic stimulation and recorded the brain's response to stimulation with electroencephalography. We also recorded pupil diameter to index norepinephrine levels directly before, during, and after stimulation. We aim to establish whether NE act as a stability modulator by assessing whether stability covaries with pupil size. Such a relation would suggest that norepinephrine plays a crucial role in influencing neural dynamics that are relevant to consciousness.

Computer Science

10. ***Photonic Design with Deep Learning***
    Presenter(s): Alex Vallone
    Advisor(s): Dr. Nasim Estakhri

In this project we used deep learning to design efficient photonic structures for different applications. We specifically focus on two problems: multilayer filters and low scattering absorbers. To achieve this goal, we have created a multi-layered tandem regression neural network (NN) to give us an inverse design neural network capable of producing design parameters from a desired response curve with high accuracy [Liu et al. 2021, Ma et al. 2021]. The recurring challenge that arises from training inverse neural networks on their own is the non-unique solution problem, which occurs when the design parameters and responses are not one-to-one [Liu et al. 2021, Xu et al. 2021]. It is possible to overcome this issue by creating a tandem NN consisting of an inverse NN feeding into a feed-forward NN [Xu et al. 2021, Malkiel et al. 2018], training the feed-forward NN first, and then using a modified loss function to train the inverse NN [Xu et al. 2021]. Using Tensorflow, we have created a schema for a feed-forward neural network, which is trained to output response curves from the limited input design parameters, and ultimately serves as the second half of our tandem network. This part of the tandem NN solely uses data-points that we feed to it to produce predictions, and then propagates the loss of those predictions [Xu et al. 2021]. In our presentation, we will report successful design of multilayered filters and low scattering absorbers, tailored for different applications.

11. ***AI and Machine Learning are Applied to Classify Human Activities Recognition with Time Series***
    Presenter(s): Liora Mayats Alpay
    Advisor(s): Dr. Yuxin Wen

Human Activities Recognition (HAR) is a challenging and fascinating topic in AI and Machine Learning. In the present work, we created a machine-learning algorithm to classify six activities of humans' daily living (ADL): walking, walking upstairs, walking downstairs, sitting, standing, and laying. We used data from the University of California at Irvine (UCI) with an experiment sample size of 30 people, ages ranging from 19 to 48, who participated and performed these tasks. The signals of this experiment were recorded with embedded inertial sensors: accelerometer and gyroscope in three-dimensional axes: X, Y, Z. The data recorded body motion using a smartphone worn on the waist. We transform the observed stochastic recordings or random body motion signals of wavelets into an artificial convolutional neural network model that needs engineering knowledge for optimization, calculation, fitting, and predicting activities model. First, we randomly split data into two sub-data: train 70% and test 30%. In the training data set, we create the Convolutional Neural Network (CNN) model, which learns to transform neurons in the artificial neural network (ANN) from observing signals to the deep learning process and demonstrates the high accuracy of classification of human activities recognition. We visualize how data changes with time in the different human activities by the time series method based on calculating the features. Then we have tested the model using the test data-set. To analyze the data and predict human activities, we give an accuracy of classification in the form of a confusion matrix, AUC – ROC, and classification report. This work can be used in medical problems, robotics, biological, financial, and other research fields, which need to classify data that changes with time.

Electrical Engineering

12. ***Implementing Genetic Algorithm for Optical Metasurface Design***
    Presenter(s): Tyler Woo
    Advisor(s): Dr. Nasim Estakhri

In this project, we use computational optimization techniques to design photonic metasurfaces for arbitrary wave bending (i.e., changing the direction of the propagation of the wave). A photonic metasurface is an extremely thin structure composed of various materials ranging from metals (such as gold and silver) to dielectrics (such as silicon and silicon dioxide) at the length scale of nanometers (one billionth of a meter). The primary advantage of metasurfaces compared to traditional optical elements (such as prisms) is the extremely compact profile which allows for easier integration and lower loss. Simultaneously, metasurfaces provide a rich design platform where the output can be controlled by different physical parameters such as the length, width, height, and material properties of the surface elements. Here we report multiple dielectric and plasmonic metasurface designs, where the surface successfully modifies the direction of the incident wave from 0 degrees all the way to near grazing angles (i.e., 90 degrees). All our designs demonstrate more than 90% efficiency, verified by full-wave simulations in COMSOL software. We use Genetic Algorithm Optimization to estimate the best parameters for each metasurface. Genetic Algorithm is inspired by natural selection to generate the most suitable “offspring” at each step, and thus moving toward the global optimum for the solution. In addition, we report metasurface beam splitters where the incident beam is divided between two oblique waves. The reported metasurfaces are part of an ultrathin interferometer design which will be briefly discussed.

Environmental Science and Policy

13. ***The Effects of Weathering on Arsenic Bioaccessibility as a Function of Particle Size***
    Presenter(s): Macy Dexter, Lauren Hu
    Advisor(s): Dr. Christopher Kim

Identifying mines containing elevated levels of As is an important step towards tackling the global issue of As contamination in humans living or working in mining communities. The aim of the current project is to examine the effects of physical weathering on the As bioaccessibility of eight different size fractions from a mine waste sample in the Empire Mine district in California. Larger particles may have a greater change in percent bioaccessibility after grinding compared to smaller particles since they have a greater initial volume and surface area available to be ground and which As may be encapsulated inside of compared to a smaller particle. To test this, sample grinding using a ring mill shatterbox was used to simulate physical weathering. Both ground and unground samples of the particle size fractions were subjected to simulated gastric fluid extractions at human body-like conditions, and inductively coupled plasma-optical emission spectrometry (ICP-OES) was used to establish the concentration of dissolved As available after undergoing the gastric fluid extractions. The largest particle size fractions (2830 - 4750 micrometers) were found to have the greatest change in bioaccessibility between the ground and unground samples (93.4%). An overall trend was observed that, as particle size increases, relative change between the ground and unground particles' bioaccessibility increases. This data contributes to the existing As bioaccessibility data found by the Kim Environmental Geochemistry Lab, providing insight into how As bioaccessibility trends at this site in the Empire Mine District compare to other locations.

Health Sciences and Kinesiology

14. ***Identifying the Neural Correlates of Postural Control: A Novel fMRI Paradigm***
    Presenter(s): Korinne Henslee
    Advisor(s): Dr. Jo Armour Smith, Dr. Laura Glynn

Postural control is essential for maintaining balance and facilitating goal-directed action during voluntary limb movement. Altered postural control in the trunk and hip musculature is a characteristic of aging and of multiple neurological and musculoskeletal conditions. It has not previously been possible to non-invasively determine the patterns of altered brain activation underlying impaired postural control in patient populations. The purpose of this study was to demonstrate the feasibility of a novel fMRI-compatible postural control paradigm and identify the brain activation associated with postural control in the trunk and hip musculature during a voluntary lower-limb task. BOLD fMRI imaging was performed on 20 healthy volunteers who performed two versions of a lower-limb task using their non-dominant, left limb. For the supported leg raise task (SLR), the leg is raised from the knee while the thigh remains supported. For the unsupported leg raise task (ULR), the leg is raised from the hip. Significant brain activation during the SLR task occurred predominantly in the right primary and secondary sensorimotor cortical regions. In contrast, significant brain activation during the ULR task occurred bilaterally in the primary and secondary sensorimotor cortical regions, as well as cerebellum and putamen. This novel paradigm enables simultaneous and noninvasive identification of human cortical and subcortical brain activation associated with postural trunk and hip muscle recruitment during a voluntary lower-limb task. Regions activated during the unsupported leg raise, but not during the supported leg raise, were consistent with the planning, execution, and sensory experience of a task involving multisegmental and

bilateral postural control, including anticipatory postural adjustments. This paradigm provides a foundation for future studies that will isolate neural mechanisms of impaired postural control in patients with neurological and musculoskeletal dysfunction.

History

15. ***The Life of Napoleon and his Influence on the French Revolution***
    Presenter(s): Bradley Parsons
    Advisor(s): Dr. John Boitano

We will study Napoleon's life and military conquests to better understand the progression from the French Revolution to the Consulate and the First Empire. We will then examine Napoleon's negative influence to understand better why his critics despise him. Finally, we will analyze Napoleon's impact on French culture today to understand his influence on the French and the country. It is said that very rarely can a man have a significant impact on the history of the world, and Napoleon is without a doubt one of those men. A little history about Napoleon, he was born in Corsica in 1769, and he studied in a military school in France. He started his career in the army in 1785 and became a brigadier general on the Committee of Public Safety. Napoleon was a controversial leader in France and had lasting effects that some people remember positively and others negatively. The most important action he took was to create a standard educational system and create secondary schools. Napoleon also contributed to the infrastructure of France with projects to build new streets and sewage systems. In addition, he facilitated the adoption of the metric system and introduced the first central bank in France. Napoleon got rid of trade guilds, monopolies, and trade restrictions in the economic realm. One of Napoleon's most important contributions was the introduction of the Napoleonic Code, a legal code that the majority of Europe later adopted.

Physics

16. ***Microwave Plasma Chemical Vapor Deposition of Graphene for Flexible and Transparent Electronics***
    Presenter(s): Aviv Zohman
    Advisor(s): Dr. Jerry LaRue

Graphene’s remarkable electrical, optical, and chemical properties make it a promising successor to indium tin oxide for applications in flexible, transparent electronics. However, efforts to manufacture graphene have been hindered by inefficient synthesis and transfer methods. Chemical vapor deposition (CVD) is commonly used to produce graphene. CVD starts with a blank surface onto which a chemical vapor is deposited to create a single graphene layer. CVD requires extreme temperatures, so only substrates with high melting points are applicable, like metals. This excludes insulative substrates such as polymers which are essential to transparent and flexible devices. Therefore, a subsequent process transfers the graphene sheet from the metal substrate onto an insulating one. During this transfer, the graphene sheet is usually deformed. On the other hand, microwave plasma chemical vapor deposition (MPCVD) enhances this approach by lowering the process temperature, thereby eliminating the need for substrate transfer. Here, we design and build a custom MPCVD reactor to directly deposit graphene on insulating substrates for applications in flexible, transparent electronics.

Political Science

17. ***Ideological Polarization Factors in the American Political Arena***
    Presenter(s): Avery Davidson
    Advisor(s): Dr. Ann Gordon

Do you ever wonder how two people can have such divergent beliefs on ideological issues? What about how someone can hold beliefs that are consistently liberal or conservative across a range of issues? There are many different factors that can contribute to determining one's political ideology such as education level, religion, region, and generation. This paper examines the extent to which these factors influence one's political ideology, and which are most impactful. Understanding the factors that influence the American voter can have profound implications for democracy and the American political process. Relying on the Chapman Survey of American Fears, a representative national sample of US adults, information was gathered on topics of political ideology as well as subtopics such as education level and religious beliefs. It was found that religion and region have strong correlations to one's political ideology. The big picture implications of this study can be used to further understand the mindset of the American voter.

18. ***Fear of Muslims: Rising Islamophobia in the United States***
    Presenter(s): Zohal Noorzayee
    Advisor(s): Dr. Ann Gordon

According to the Bill of Rights, the United States glorifies itself over the legal notion that religious tolerance and acceptance serves as a major foundational component that the U.S. was built upon. By granting citizens the ability to practice religion freely, without government interference, the United States has been able to become a melting pot for several different religions. Following the attacks of 9/11, Islamophobia in the United States reached tremendous heights with hate crimes, an increase in surveillance, and stronger security against Muslims across the nation. Using the Chapman Survey of American Fears 2020-2021 results conducted by Chapman University scholars, I was able to draw a relationship linking Americans who fear Muslims with those who hold a more Conservative ideology. After cross analyzing the data, we are able to determine that 72% of people who're "very afraid" of Muslims identify as moderate Republicans. Those who fear Muslims, are likely to believe that Islam is incompatible with Western democracy and as a result, more likely to be reluctant in supporting immigration from predominately Islamic countries. The apprehension towards Muslims in the United States may not always be physically present, but acts as an omnipresent force that can be seen through people's hesitancy in advocating for religious inclusion, such as permitting mosques to be built in their neighborhoods. Although the United States preaches religious toleration, the rise in Islamophobia among different partisan groups presents a major issue that invalidates a fundamental feature of democracy.

19. ***Down the Rabbit Hole: How Non-Traditional Media Consumption can Lead to Conspiratorial Affiliations***
    Presenter(s): Trevor McNally
    Advisor(s): Dr. Ann Gordon

Conspiratorial ideas have permeated the American ethos for decades. Whether it be Hollywood faking the moon landing to government involvement in the 9/11 attacks on the twin towers, there has always been a subsection of the population who believes larger malicious forces are at work. As humanity moves

towards a more digital existence, conspiracy theorists also have advanced; enter Qanon. This paper will attempt to deduce the correlation between members of the Qanon community and what external factors could drive one to this belief. Qanon is a conspiratorial community that has attached itself to former President Donald Trump; their thoughts are intriguing, ranging from government corruption to the occult. The groups can attribute its founding to online forums where "Q" was conceived, lurking in dark corners of anonymous websites exchanging information about the "conspiracy." However, in recent years "Q" has emerged from the shadows and made its way into the fray. QAnon presents an interesting case study on how digital media can influence individuals' behavior and beliefs. This paper will investigate how different forms of media consumption correlates with the adoption of conspiratorial beliefs. Furthermore, due to the pertinence of Donald Trump in the conspiracy, and the level of the radicalism of the individual will investigate party affiliation in conjunction with emotions tied to the January 6th insurrection. This investigation will be conducted by cross comparing variables and their intersections by utilizing the Chapman University American Fear survey. By understanding how online information can be leveraged to shape one's own beliefs, it could be possible for regulators to predict who and when someone will fall prey to these ideologies.

20. ***Connections between Political Party Identification and One's Viewpoint on Covid-19 and the Vaccine***
    Presenter(s): Oliver Ludwig
    Advisor(s): Dr. Ann Gordon

During the time of the pandemic, many people had many different thoughts and positions on Covid-19 and the eventual vaccine that would come out to fight this disease. During the time when the vaccine was still being produced, the discussion on whether the vaccine would be effective or even worth was being discussed among several political party groups. This research paper attempts to find if there is a connection with a certain political party and refusing to take the vaccine or even not believing in the severity of Covid-19. Primary research points will attempt to show why this political party thinks this way, which groups of people within this political party are the most unwilling to take the vaccine and which "information" channels are the most popular with the unwillingness of taking the vaccine.

Psychology

21. ***Engagement in Consensual Non-Monogamy and Multi-partner Sex during the COVID-19 Pandemic: Insights from a National Sample of Single Americans***
    Presenter(s): Kaylie Posen, Manya Dhupar, Amanda Gesselman
    Advisor(s): Dr. Amy Moors

For many, the COVID-19 pandemic and social distancing gave people time to think about their sex lives. Previous research by Lehmiller and colleagues (2021), showed correlations between loneliness and stress with increased sexual risk-taking and new sexual desires during the pandemic. In the present study, we examined the prevalence of engagement in consensual non-monogamy and multi-partnered sex during the COVID-19 pandemic taking into account sociodemographic factors and living arrangements. We analyzed data from a national sample of people who are currently single in the U.S. as part of The Kinsey Institute's annual Singles in America study (N = 3,622; 60.7% identified as women; 39.3% identified as men; 88% identified as heterosexual/straight people; 12% identified as lesbian/gay/bisexual). Data were

collected in June-August in 2021 when vaccinations were widely available in the U.S. We found that a small, but sizable proportion of single people engaged in diverse types of multi-partnered relationships and sexual acts during the pandemic. Specifically, 8.1% of single Americans indicated that they had engaged in a consensually non-monogamous relationship during the pandemic followed by 3.8% and 3.1% who indicated that they had a threesome or group sex, respectively. Men and sexual minorities (lesbian, gay, and bisexual people) were more likely to have engaged in consensual non-monogamy and multi-partner sex during the pandemic than women and heterosexual people, respectively (Brange: 0.53-0.89, pvalues < 0.01). Associations between living arrangements and desire for socializing will also be discussed as individual difference factors. These data suggest that engagement in consensual non-monogamy and multi-partnered sex during the COVID-19 pandemic is more prevalent than some people may expect.

22. ***Empathy in Health Professions: Effects on Patient Satisfaction, Anxiety, Trust, and Health Care Professional's Job Satisfaction***
    Presenter(s): Sophia Kelsey
    Advisor(s): Dr. Desiree Crevecoeur-MacPhail, Dr. Tara Gruenewald

With healthcare as a growing concern, it is essential to evaluate empathy levels in healthcare professional's (HCP's) communication to determine the effects on patient satisfaction, anxiety, trust and HCP job satisfaction. Interpersonal theory explains that understanding relationships is important to understanding behavior and has been used to evaluate nurse- patient interactions in the past. Maintaining strong relationships with nurses correlated with a positive patient perception of their healthcare experience. To examine these effects for HCP-patient interactions, college students participated in a study which required them to recall the last time they engaged in healthcare before they took the Generalized Anxiety Disorder (GAD-7), Short Form Patient Satisfaction Questionnaire (PSQ-18), Trust in Physicians Scale, Single Item Job Satisfaction Scale and Adapted Perceived Empathy Measure. The results are expected to show that increased empathy levels shown by HCP leads to higher patient satisfaction, reduced symptoms of anxiety, higher levels of trust and higher HCP job satisfaction. The results can help inform educational systems for future HCP and ensure that healthcare can be a positive experience for patients and HCP alike.

23. ***Likelihood of Individuals Seeking Therapy Based on the Location of Upbringing***
    Presenter(s): Abigail Paine
    Advisor(s): Dr. Tara Gruenewald, Dr. Desiree Crevecoeur-MacPhail

Research was conducted to investigate the association between individual's likelihood of seeking therapy and the location of their upbringing. Specifically, research focused on understanding people's attitudes toward mental health treatment based on where they grew up and where they currently live. Through an anonymous study survey, data was collected using The Mental Help Seeking Attitudes Scale to measure participants' mental health stigmas along with self-reported questions about one's upbringing. Previous literature revealed that social stigma predicted people's attitudes toward seeking therapy in the United States, but there was a lack of research on the geographic location playing a role. Hypothesis one stated that the presence of negative mental health stigmas in a given area will reduce the residents' likelihood of attending therapy sessions. Hypothesis two predicted that high internal disapproval surrounding mental health will worsen the individual's self-reported implicit feelings towards seeking therapy.

Hypothesis three stated that individuals who previously refrained from help-seeking behaviors in their communities will choose not to access psychological services as college students. Finally, it is hypothesized that negative perceived public stigma surrounding mental health will deter individuals from seeking therapy more than one's own personal stigma. Overall, research was conducted to examine the association between individual's likelihood of seeking therapy and the location of their upbringing in hopes of understanding what areas of the country need to emphasis mental health treatment.

Religious Studies

24. Astrology in Ancient Mesopotamia

Presenter(s): Tamara Dardari

Advisor(s): Dr. Julye Bidmead

What is astrology? Where did it come from? How did it come to be? Astrology originated from a number of different ancient countries including ancient Mesopotamia. Seeing as how important omens were to the ancient Mesopotamians, curiosity strikes in learning to see how astrology affected the way that they thought and how much of an impact that it had on them. I am curious to learn about what they thought of astrology and how they came to the discovery of it and if it played any part in determining factors for the ancient Mesopotamians. Seeing how important ancient Mesopotamians thought omens were I feel like astrology held just as much of an importance and was a big part of their belief system since it connects them with the earth and (to them) god. I feel like from learning more about astrology in ancient Mesopotamia it will give a better understanding of where some of their beliefs come from if astrology plays a big a role in their lives as I expect it to. I am also interested to learn and see if astrology had any role with the gods of ancient Mesopotamia and if that affected who they were seen as and the reputations they had. I am also confused as to how the ancient Mesopotamians came up with the idea of astrology and what they used to come to this and how they determined what and the reasoning for the names of everything. The idea of astrology coming from ancient Mesopotamia interests me a lot because I feel like it is such a mystery as to how all of these things came about and what began it all. Astrology has become such a popular topic today and I am interested to see how it compares to when the ancient Mesopotamians first discovered it. I feel like with doing more research it will just give a better perspective on astrology itself and the role it plays in ancient Mesopotamia.

25. Astrolomy: The Ancient Mesopotamian Studies of Astrology and Astronomy

Presenter(s): Hannah Leis

Advisor(s): Dr. Julye Bidmead

Without the use of modern technological advancements and equipment, ancient Mesopotamian astrologers studied the stars and constellations to formulate counting systems, such as the 365 day year, 60 minute hour, and 60 second minute, and more, all of which we still use today. In the first millennium, they observed celestial phenomena and recorded it on star calendars, similarly resembling modern astrological birth charts and maps of the galaxy. As their scientific discoveries advanced, these findings shifted into two major studies with vastly different connotations: astronomy and astrology. Astronomy is a revered study of the universe and cosmos with major funds for research and undeniable legitimacy. Astrology is the opposite, considered a pseudoscience with little backing as it examines the planets and their effects on earthly events. Though they are now considered two separate sciences, Ancient

Mesopotamians studied these as one, gaining insight into how the universe effects life on earth. This project addresses the question of why astrology and astronomy have diverged, by looking at star calendars and comparing them to similar charts found in astrology and astronomy. These findings highlight the overlaps between Ancient Mesopotamian mythology and modern-day science as these stories worked hand in hand with major scientific research, helping to kickstart the research we study today. Throughout this research, I expect to find lots of resemblances between these areas of study as well as a connection to spirituality as it is heavily impacted by science.

26. Mesopotamian Kingship's Connection With Divinity

Presenter(s): Yitong Zhang

Advisor(s): Dr. Julye Bidmead

Sumerian and Babylonian kingship is closely tied to their magic and religious belief. Inana, also named Ishtar, is a goddess whose power is associated with many various realms including royal authority. Ancient Mesopotamians believed that the lion is a symbol of absolute royal power, and Inana often appears with lion figures. Besides the lion, a daisy-like flower symbol called rosette often appears in circumstances related to kingship. The famous Ishtar Gate, built by Babylonian King Nebuchadnezzar II (604–562 BCE), is decorated with lions, rosettes, and other symbols of the gods. Every year, in a celebration of the renewal of kingship, statues of the gods, accompanied by the king would process through this gate. Additionally, many Mesopotamian palace reliefs and the jewelry of royalty featured rosette imagery. In this research project, I will be looking into the connection between Babylonian and Sumerian kingship and deities. I will explore the beliefs and symbolism underlying the royal power and divine energy. My hypothesis is that the kingship is managed by the gods they worship as human beings are living under the deities' blessings.

27. Ancient Mesopotamian Art

Presenter(s): Juliana Pinto

Advisor(s): Dr. Julye Bidmead

My main topic of interest will be Mesopotamian art. I wish to inquire further into what they considered fine art. What types of riches the nobles would have. What things were made simply to sell. There is such a variety of what is considered to be art today so I am quite curious to know more about what was considered art back then in such an advanced society. I know about their cravings being the main source of artwork but I want to know more. I am a huge fan of art, especially fine art. Obviously, I also have a passion for history. I love combining different passions of mine to learn really interesting things. I know Mesopotamians are also sort of known for erotic artwork. I find it quite interesting to know that in history, sex was not always so shunned. There are always a couple of exceptions but most ancient societies and people of the past tended to steer clear of any mention of sex. The Mesopotamians did the opposite and were quite open. Lots of ancient erotic tablet carvings have been unearthed. Many people nowadays would still be uncomfortable or disgusted by erotic art but I believe it to be quite important. Sex is a part of who we are, it is how we are made. The ancient Mesopotamians knew that and honored it with their form of art.

28. ***Protective Magic: The Making and Use of Amulets Against Demons and Ghosts***
    Presenter(s): Lily Goldklang
    Advisor(s): Dr. Julye Bidmead

In our world today, we have many superstitions and protective gear to wear to ward off various spirits that we think may bring us bad fortune. Yet you must wonder, how did people during the Mesopotamian era ward off evil? Two of the most feared supernatural beings in the Mesopotamian world were demons and ghosts. Ghosts were the spirits of the underworld that would come to haunt people if they were unhappy with their burial/ mourning process or the circumstances of their death. Demons, on the other hand, were seen as tools of the gods. Demons would be sent forth by gods to punish people for their wrongdoings; bestowing hardship upon them such as disease or storms. If someone was feeling sick or mentally unwell- it was typically blamed on either a demon or a ghost.There is no way of expecting when a demon or ghost may be coming your way, so people resorted to various types of protective magic- especially ones to wear around their necks. Amulets were a very common form of protective magic against demons like Lamashtu. She was known for stealing babies, so women would wear amulets around their necks to ward her off. This amulet would contain a depiction of the counter demon Pazuzu, who could ward off his nemesis, Lamashtu. Mesopotamians also wore inscribed amulets to keep ghosts away. If a person had a headache, ear problems, mental disorders, and/or other ailments, they believed they were afflicted by ghosts. With ghost amulets, they contained simple ingredients like herbs, but also very unusual ingredients like the dust of a human's skull. By learning about why the ghosts/ demons brought hardship upon the people of Mesopotamia, we can discover why the use of amulets (and the importance of the ingredients used) was so normalized.

Sociology

29. ***Be the Change: The Adoption of Student-Proposed Sustainability Measures in Higher Education***
    Presenter(s): Eva Stanton
    Advisor(s): Dr. Stephanie Takaragawa

Participation in protests, petitions, or advocacy campaigns is often viewed as a big part of the college experience for many students. Young developing professionals with unlimited potential emerge into the world they have been told is their oyster. Just as earlier generations had done so before, it is now their time to raise their voices and mold the society of the future. Such actions have been taken at Chapman University, where students are told they can accomplish "anything imaginable", as students form special interest clubs, create campus-wide petitions, and engage in public displays like protests and rallies, raising awareness, encouraging conversations, and inspiring change. One example of such activity has been the effort to bring solar power to Chapman's campus or encouraging the institution to divest from fossil fuels. Existing environmental clubs like Mission Environment, Senior Capstone Projects like the Environmental Science and Policy Campus Audit, and even organizations created for purely this purpose like Net Zero Chapman have attempted to convince the administration to make changes toward sustainability. Several assumptions have been supposed as to why Chapman's new buildings do not have solar capabilities, be it tied to funding, internal politics, or community aesthetic guidelines. And while different conceptions or rumors as to why such proposed measures are adopted or rejected circulate within the student body, little is known about how these institutions and administrations make such decisions. In order to discover

how universities adopt recommendations from student-led advocacy campaigns a case study of student-suggested sustainability measures at Chapman University was completed through interviewing students and faculty, the creation of a power dynamics map, and documentation of both successful and unsuccessful changes that have come about.

World Languages and Cultures

30. ***A Comfortable Revolution and Uncomfortable Ideas, The Bourgeois-Socialist Representation of a Revolution in Germinal***
    Presenter(s): Corwin Rybchinskiy
    Advisor(s): Dr. John Boitano

Germinal by Émile Zola is an iconic book in late 19th Century French Literature. The book's story depicts the ever-present class conflict that has formed and continues to mold French society. In the book, Zola depicts various ideologies that had been growing and changing over the past few decades. These ideologies of Socialism, Anarchism and Social Democracy are represented by various characters and influence the struggle of coal miners against a capitalist ruling class. However, Zola's depictions of these ideologies are not truly representative of the movements at the time. Instead, Zola heavily misinterprets or falsely depicts these ideologies in order to discredit them. To discover why Zola goes to such lengths to misrepresent the ideas that fuel this story, we can investigate his works as a journal writer during the rise and fall of the Paris Commune. By analyzing his writings, we can see how his attitudes towards revolutionary actions and ideologies shifted in response to the revolution happening in his own city of Paris. In understanding the direct influence of Zola's perspective in his writing, we can get a better look at how bourgeois-socialist intellectuals may have interpreted the desperate revolutions, growing ideologies and worker uprisings that rose and fall during the turn of the century.

31. ***Women in Opera: From Damsels in Distress to Young Men***
    Presenter(s): Cara Benner
    Advisor(s): Dr. John Boitano

The opera tradition has been a means of entertainment for centuries, capturing audiences with its thrilling plots and heart-wrenching beautiful melodies. The role of women, or lack thereof, reflects on the societal values at the time of its creation and gives an impression of how women were perceived. Today, opera faces harsh criticism for its lack of feminism and the treatment of its women. While their male counterparts don't always make it to the end of the opera, it is far more common for the leading lady to meet an unfavorable and unhappy ending, such as those in "Tosca" and "Madama Butterfly." This paper explores the disparity between female and male roles in 19th-Century French and Mozart operas, as well as how different types of female roles represent diverse aspects of patriarchal society. The history of castrati and how it relates to the close-minded nature of European society is included to demonstrate the evolution of operatic roles. Specific operas, such as "Carmen" and "Les Contes d'Hoffman," will also be examined to showcase the different ways in which women are portrayed and received through opera. Finally, this paper will analyze the purpose of trouser roles (roles in which a woman, usually an alto, portrays an adolescent boy) and their reflection on women's versatility to be damsels in distress, "femme fatales," villains, or even young lovestruck boys, in the case of trouser roles.

32. Jean Cavailles : From the Black Board to the Battlefield

Presenter(s): Natanael Alpay
Advisor(s): Dr. John Boitano

During the second world war, there were many influential figures in the armed and intellectual resistance against Nazi Germany in France. Still, few were partaking in both, and even fewer to the extent of Jean Cavailles. Born on 15 May 1903 Saint-Maixent, France, Jean Cavailles started his life as an academic, working with Nobel prize winner and graduating from Lycée Louis-le-Grand before entering the École Normale Supérieure in 1923, two of the most prestigious universities in Paris. In 1939, a few days after the German invasion of Poland, he volunteered and was stationed on the Maginot Line in a reserve unit; however, with the German Army's advances, it was not long until he saw his first combat. He led numerous successful missions against the Germans and was promoted to lieutenant before the end of the fight. During his service till after his death, he received several military honors from both France and other allied countries such as Belgique. With the surrender of France, J. Cavailles, like many others, was not yet ready to give up. So with a few writers and editors from journals, he started his first resistance journal and was one of the pioneers of intellectual resistance in France. He was captured multiple times, but with a bit of luck, he managed to escape, and in 1942 he left for England, where he met the future president and war hero Charles De Gaulle. With a new fighting spirit in him, he returned to France, joined the armed resistance, and performed numerous sabotage missions. In 1944 his luck ran out, and he was captured by the SS after being given away during an interrogation of one of his resistance members. He was put in front of the German military court under the accusation of espionage and sabotage. During his time in prison, he spent his time working on his work about the philosophy of science and wrote the Theory behind the philosophy of the concept, a whole new philosophical way of thought based upon science and mathematics. His legacy is forever remembered for its enormous contribution to the resistance forces and academic contributions.

33. Fin De Siecle, Hope For a Better Future

Presenter(s): Monica Perez
Advisor(s): Dr. John Boitano

This purpose of this paper is to explore how literature and art during late 19th century France helped change living standards and to the introduction of laws which were aimed at providing equal comfort amongst the upper and lower classes. To explore this, I will analyze the Fin de Siècle, A period defined by Eugen Weber as, “A time of economic and moral depression, a great deal of less redolent of buoyancy or hope. And yet, a lot took place During these two decades that made life better for a lot of people.” (Weber, 2) The youth of this period felt that they were coming into a world where “all that was is no longer, and all that will be, is not yet.” (Musset) This attitude gave power to the masses, as did literature and art at the time. Literature was heavily concerned with promoting social change. Renowned French author Emile Zola’s work is culmination of the concerns of the Fin de Siècle. Zola’s work and other art with will show to have a lasting impact in molding and promoting this social change. While studying the generation at the time, this paper will follow gradual introduction of policies or social programs aimed at increasing comfort and creating equality.

AF 209A

Communication Studies

10:00am-10:20am

The Big Fib: A Content Analysis of How Children Detect Lies

Presenter(s): Audrey Shin, Nicole Yoo

Advisor(s): Dr. Austin Lee, Noel McGuire

As technology becomes more prevalent in our daily lives, children are now exposed to a large amount of information at a young age. However, children are a particularly understudied population in the area of deception detection research. A content analysis of the podcast The Big Fib was conducted to determine how children detect deceit. The data was examined through the lens of the truth default theory, which states that reliance on the sender's nonverbal behaviors does not lead to accurate judgments of deception. It is expected that children will be more likely to detect lies based on information rather than paraverbal clues and that information-based detection will be more accurate than other reasons. The study found that children were able to correctly detect deceit at a rate equal to chance regardless of their reasoning. Although children were found to be more likely to base their decisions on prior knowledge over paralinguistic cues, information-based assessments did not increase the accuracy of their deception detection. Furthermore, age and gender did not have a significant impact on the child's ability to correctly identify the liar. These findings indicate that the truth default theory also applies to children and could lead to the expansion of deception detection research as a whole.

10:20am-10:40am

The Effect of Relationship Satisfaction and Intimacy on Self-Esteem

Presenter(s): Ava Martinson, Grace Tellers, Anyssa Martinez, Macy Werner

Advisor(s): Dr. Austin Lee

Self-esteem is unique to each individual and a challenge that many struggle with on a daily basis. Many factors contribute to how one may feel about themselves whether that be from others or their own perceptions. In this study, we would like to examine if self-esteem is affected positively by experiencing sexual intimacy with a partner. Previous research has yet to connect sexual intimacy with self-esteem. In this study, the three variables measured are intimacy, relationship satisfaction, and self-esteem. Participants completed a questionnaire including questions from the Personal Assessment of Intimacy (PAIR), the Relationship Assessment Scale (RES), and the State Self-Esteem Scale (SSES). It is expected that there will be significant positive correlations between intimacy and relationship satisfaction as well as intimacy and self-esteem.

Public Relations and Advertising

10:40am-11:00am

Find Your Next Now, An advertising campaign for Tinder, 2022

Presenter(s): Zoe Rosenblum, Elizabeth Hall
Advisor(s): Kathryn Thibault

We were presented with a national challenge by the American Advertising Federation of creating a multi-touchpoint advertising campaign for Tinder that would grow brand love, consideration, and preference for 18 to 19 year olds. In addition, our team goal was to position Tinder as our target's go-to for all things entertainment and lifestyle, and to make Tinder an app that they interact with on a daily basis. Our team used both primary and secondary research to gain better insight into the category, our target audience, and Gen-Z as a whole. To accomplish this, we purchased a target audience list to most effectively reach a national statistically significant and projectable representation of our target. We also conducted focus groups, sentiment testing, one-on-one interviews, and a comprehensive competitive audit. Through this our team realized how much Gen Z values their individuality, built a case for anticuration, and segmented our target into three different personas. Despite Tinder being top of mind for our target audience, many had a negative perception of Tinder. Discovered barriers included safety concerns, a large gender disparity, skepticism, and a perception of Tinder as a hook-up app. Research spotlighted these concerns, but also provided an opportunity for Tinder to be rebranded, and to address and reframe perceptions. Out of this, a campaign was conceived to expand and normalize the many uses of the app; generate awareness about Tinder's ability to create a modern "meet-cute"; and create a cohesive and authentic image that is more inclusive of all Tinder's capabilities. These findings birthed the big idea of our Tinder campaign: Find Your Next Now. The rationale for this: Tinder isn't about forever unless you want it to be. Flexible with fill-in-the-blank potential, yet strong enough to stand on its own, the big idea embraces everything Tinder has to offer.

AF 209B

Psychology

10:00am-10:20am
Decision Making and Anxiety
Presenter(s): Taylor Munro
Advisor(s): Dr. Desiree Crevecoeur-MacPhail, Dr. Tara Gruenewald
The purpose of this study was to determine a relationship between anxiety and decision-making. Evidence has propelled the understanding that self-esteem may serve as an anxiety-buffering function (Greenberg, 1992). Higher levels of self-esteem are thereby correlated with lower levels of anxiety. Additionally, when making decisions, individuals often weigh the pros and cons of each possible alternative outcome; people place importance on being in control, which correlates with both physical and mental wellbeing. Emotional distress occurs when an individual is presented with multiple choices due to fear of not choosing the best available option (Mindel, 2015). Furthermore, the doubt associated with Obsessive-Compulsive Disorder (OCD) is laden with a lack of conviction or certainty, which are necessary for adaptive functioning; it has been indicated that the irrational fear of choosing or acting wrongly is more spurred by contemplation, increasing need for rational thought to avoid potential consequences, and not so much of the rational outcome (Aranovich et al., 2018). Participants were required to respond to an OCD screening tool, the Rosenberg Self-Esteem Scale, and the GAD-7. They were then presented with four scenarios in which they had to make a decision, after each they were asked two questions to indicate their level of confidence in their decision and anxiety experienced while making the decision. It was expected that students with higher scores of self-esteem would be more confident in their decisions. It was also expected that students who indicated higher levels of anxiety and/or obsessive-compulsive tendencies would take longer to make a decision and would indicate more anxiety and less confidence in the decision they made. Future research may imply means or methods of preventing high levels of anxiety when being faced with making a decision.

10:20am-10:40am
Facial Recognition Study
Presenter(s): Jessica Gibbons
Advisor(s): Dr. Tara Gruenewald, Dr. Desiree Crevecoeur-MacPhail
Facial recognition is frequently inaccurate when it comes to identifying someone outside of one's race, sex, and age. This misidentification can lead to wrongful incarcerations, erroneous eyewitnesses, and difficulty in training someone to be better at facial recognition. The Cross-Race Effect has shown that humans have more difficulty in accurately recognizing and remembering faces outside of their own race. The proposed study examined psychological correlates of facial recognition accuracy including social anxiety and depression severity. The study examined results gathered by a survey sent out through Chapman's SONA system as well as through social media. We expected to find that older (80+) individuals as well as participants with more severe social anxiety and depression would perform worse at facial recognition. It was also expected that Caucasian participants would perform better due to the Cambridge Face Memory Task only having Caucasian photos. If the hypotheses are supported, facial recognition in police lineups and eye-witness testimony should be reviewed for accuracy and examined to see if other

alternatives are less erroneous. In addition, if the hypothesis are supported then more research should be done on effects of multi-race facial recognition tests as well as different mental illnesses.

10:40am-11:00am

Adverse Childhood Experiences: The Creation of Aggressive and Violent Adults

Presenter(s): Ruby Moss
Advisor(s): Dr. Tara Gruenewald, Dr. Desiree Crevecoeur-MacPhail

Adversity faced in childhood has long been referenced as a risk factor for mental and physical health problems in adulthood. However, there is a large gap in existing literature about how adversity faced in childhood correlates to aggressive behavioral problems in adulthood. To investigate this correlation participants of this study took both an adapted Adverse Childhood Experiences Questionnaire and the Buss Perry Aggression Questionnaire. It is expected that children who experienced physical abuse and witnessed physical abuse will exhibit more aggressive behavior than children who did not. It is also expected that children who experienced adversity in early childhood between the ages of zero and 10 will display more aggressive behaviors than children who experienced adversity in later childhood. When looking at gender as a moderator, it is expected that men will report more physically aggressive behaviors than women, but when considering a modern definition of aggression, there will be no gender differences. Furthermore, children who were subjected to abuse by a male perpetrator or by both a male and female perpetrator will report more aggressive behaviors in adulthood when compared to children who were abused only by a female perpetrator. Having a better understanding of the effect of adversity in childhood on behavior in adulthood can aid us in helping aggressive adults address their childhood trauma and begin to change their behavior.

AF 209C

Psychology

10:00am-10:20am
Impacts of Adolescent Bereavement
Presenter(s): Haley Waldron
Advisor(s): Dr. Tara Gruenewald, Dr. Desiree Crevecoeur-MacPhail
Mental illnesses, specifically anxiety and depression, are an important public health issue (Henderson, 2013). To develop protective mechanisms to decrease the future levels of depression and anxiety in our society, it is good to know what experiences produce them, who is more likely to develop symptoms, and at what points in one's life are people particularly vulnerable to mental illness. Additionally, given the acknowledgment that events in childhood can have lifelong repercussions, it's important to better understand specific types of childhood trauma to lessen future diagnoses of behavioral dysfunctions (Nader, 2011). The goal of this study was to examine links between the experience of childhood bereavement and levels of anxiety and depression in adulthood. In addition, key moderators of these associations, including age of childhood bereavement experience and gender, were examined. Exploratory analyses examined the relationship of the lost loved one as an additional moderating factor. Participants were recruited from the Chapman University Psychology Department Participant Pool to complete an online survey that assessed bereavement experiences in childhood, levels of depressive and anxious symptomatology, and demographic characteristics. The occurrence of loss of specific categories of loved ones (e.g., mother, father, brother, aunt) and the age of occurrence was assessed. Anxiety and Depression were assessed with the Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1988) and Beck Depression Inventory (Beck, et al., 1961). Analyses will examine the hypothesis that levels of anxiety and depression will be higher in those with a childhood bereavement experience. It is also hypothesized that these associations will be stronger in females as compared to males and in those who lost a loved one in adolescence as compared to those in adulthood. Study findings may contribute to our understanding of the long-term correlates of childhood bereavement experiences for well-being in adulthood. Such knowledge may inform therapeutic treatments and intervention.

10:20am-10:40am
Affectionate Communication and Relationship Satisfaction in Multicultural Individuals
Presenter(s): Regina Juarez
Advisor(s): Dr. Tara Gruenewald, Dr. Desiree Crevecoeur-MacPhail
Previous studies on affection have shown that, overall, showing and receiving affection leads to more positive relationships with others. However, few studies consider socio-cultural factors in expressing affection. Given the limited research in this area, the current study examined the relationship between cultural orientation and the style of communication of affection in various relationship types. This was done by analyzing the relationship between individuals' levels of affection in three relationship types (parent-child, romantic, and platonic), their levels of satisfaction in these relationships, and the cultural orientation (collectivist vs. individualistic) of the individual and their parent, partner, and friends. In addition, the association of cultural orientation and how satisfied individuals were in their interpersonal

relationships was explored. The Affectionate Communication Index (ACI) was used to measure participants' affection levels in parent-child, romantic, and platonic relationships, while the Burns Relationship Satisfaction Scale (BRSS) was used to measure participants' satisfaction in their interpersonal relationships. The study's findings may suggest that there is a relationship between affectionate behaviors, cultural orientation, and relationship satisfaction. Understanding how these factors connect with each other can help clinicians, educators, and counselors be better equipped when working with individuals who are struggling with adapting to a new culture, relating to others from another cultural orientation, and/or expressing affection to another person from a different cultural orientation. Furthermore, the results from this study can be used to better understand the various ways people from different cultural orientations express their affection to others.

10:40am-11:00am

Cognitive Heuristics in Jury Decisions

Presenter(s): Sarah Band

Advisor(s): Dr. Tara Gruenewald, Dr. Desiree Crevecoeur-MacPhail

In recent years, media outlets have painted the criminal justice system as a biased body that is showing the disparities between different social groups and their criminal sentences. By looking at the cognitive heuristics involved in the jury's personal biases the outcomes of deliberations and sentences can be examined. Gigerenzer and Engel (2006) suggest that often these cognitive heuristics occur because often jurors are legally and logistically unprepared. Using a survey designed to mimic a mock trial/jury, participants were asked to read a case study, deliver a verdict, read six mock juror's individual consensus statements, and deliver a final verdict. The criteria that was analyzed included the difference in good and bad in court conduct of the defendant, the race of the defendant, and the heterogeneity or homogeneity of the race of the juror group. The results are hypothesized to indicate that those who had a defendant that matched their race and had good in court conduct delivered a lighter verdict. Those who had a defendant who had bad conduct and did not match their identified race delivered a harsher verdict. The homogeneity and heterogeneity of the mock juror group statements are hypothesized to have a slight significance indicating that the racial makeup of jury panel can have an effect on the verdict of a trial. Overall, the hypothesized findings indicate the demographics of a jury panel and that of the defendant have an impact on trial outcome as well as the conduct of the defendant in court.

AF 209A

Communication Studies

11:30am-11:50am

Influenza Persuasion through Chabot

Presenter(s): Audrey Shin, Nicole Yoo

Advisor(s): Dr. Austin Lee, Noel McGuire

With anti-vaccination ideology increasing especially in relation to the COVID-19 pandemic, it
An artificial intelligence chatbot was developed to inform and persuade users to receive the influenza vaccine. Previous studies have found that humans treat robots as if they are social beings and apply the same criteria of credibility when they interact with AI. The chatbot, named FluX, is designed to communicate with users using natural language processing and streamline interactions between people and services. The chatbots are created using AIML, an open-source chatbot scripting language, and deployed through the Pandorabot platform. The chatbot's database was adapted from the CDC and WHO with persuasive messaging using theories of credibility and message framing. This study aims to discover whether message framing has a significant impact on the user's attitudes and behavioral intentions towards the influenza vaccine. The experiment uses a post-test only 3x2x2 factorial design. The independent variables were credibility and message framing (gain vs. loss; egoistic vs. altruistic). Participants will be randomly assigned to one of the twelve conditions. The dependent variables are the participant's attitudes towards vaccination and intention to receive the influenza vaccine after exposure to the stimulus. This study will help determine the extent to which vaccination persuasion chatbots are effective and whether they should be more widely implemented in the healthcare industry.

11:50am-12:10pm

The Negative Effects of Social Media

Presenter(s): Parker Johnson, Johnnie Ladd, Ben Grant, Chris Bogan, Joseph Taman, Talia Haddad

Advisor(s): Dr. Austin Lee

Social media is a way for our world to connect with one another and has become a vital resource in our society. With social media usage increasing rapidly, our group wondered how this has affected the mental health of social media users. Studies have found that young adults often compare themselves to others on social media leading to a decline in self-esteem (Midgley et al., 2020). We are conducting this study in order to determine the correlation of a person's mental health compared to the amount of time they focus towards social media in their daily lives. Our hypothesis is that increased social media usage negatively affects mental health due to decreased self esteem levels and an increase in social-comparison. By conducting an online survey, participants were asked to share what social media platform they were active on as well as how often they were using them during the week. Participants were also asked to share how often they felt depressed within the last month along with different ways they have felt mentally within the last week. The survey uses a series of different questions in Likert-type scales to obtain how these social media platforms made participants feel while using them.

12:10pm-12:30pm

Watching Viral Shows: FoMO & Need to Belong

Presenter(s): Kaylee Snow, Kyla Turner, Erin Collins, Derrik Engel
Advisor(s): Dr. Austin Lee

The uptick of social media platforms such as TikTok, Instagram, and Twitter, have caused shows like Euphoria and Squid Game to circulate among millions of people. Do those viewers watch television shows for their enjoyment, or is watching these viral shows becoming part of the social norm? Virality within social media consists of large quantities of people reacting to a message or post, either positively or negatively, and judging its relevance enough to share with others. Our study aims to understand and discover if the fear of missing out and the need to belong are positively correlated with the overconsumption of viral shows. We will be conducting our study through an online survey where our participants will remain anonymous to protect their privacy. This study utilizes a fear of missing out scale to understand better how it plays a role in what entertainment we consciously and unconsciously choose to watch. We also utilize the need to belong scale, a 10-item measure of the human need to belong, to gauge our participants' desire to belong to the social norm. The variables from the survey will not be manipulated. With the results, we will analyze the individual differences between peoples' need to belong in relation to their consumption of viral shows.

AF 209B

Chemistry

11:30am-11:50am

Investigating the role of the counterion in calcium-mediated sulfur-fluoride exchange

Presenter(s): Leah Zahn

Advisor(s): Dr. O. Maduka Ogba

Calcium triflimide, triflate, and fluoride salts have recently gained attention as cheap, abundant, and non-toxic Lewis-acid catalysts. However, little is known about the mechanism of activation or the role of the counterions in these chemical reactions. Recent experiments show that calcium bistriflimide was effective in activating sulfur (VI) fluorides toward nitrogen-containing sulfur (VI) compounds via sulfur-fluoride exchange (SuFEx). When calcium fluoride was used as the Lewis-acid activator instead of bistriflimide, significant reuctions in yield were observed, suggesting the non-innocent role of the counterion in facilitating calcium catalysis. In this work, density functional theory methods were used to compute and compare the SuFEx mechanism mediated by calcium fluoride to that of calcium bistriflimide. Structural, energetic, and electronic properties of the activated species are analyzed to reveal the origins of counterion-induced differences in reactivity between calcium Lewis-acidic salts.

Communication Studies

11:50am-12:10pm

Relationship-Centered Media and Cultivation Theory

Presenter(s): Katie Wilkinson, Angel Hsu, Matthew Binger, Lindsay Shahin

Advisor(s): Dr. Austin Lee

Healthy relationships, especially in regards to a significant other, have always been sought after and desired by humans. People will often pick up on social queues and observe behavior as a way to understand social norms and better fit into a collective society. The consumption of media, especially in today's world, has played a significant role in influencing the way consumers process information/scenarios by immersing themselves into stories and developing a moral sense of how the world functions (Bilandzic, H., Schnell, C., & Sukalla, F. 2019). Television shows such as Love Island or The Bachelor/ette emphasize emotional drama between couples and the desire to find the "perfect partner." It has only been further enhanced by social media platforms such as Tik Tok and Instagram, which allows for people to view a multitude of relationships on display and further highlights existing ideas. These ideas can be addressed by Cultivation Theory which infers that the more time we spend living in the mediated world the more we believe that that world is real. This caters to the idea that we live in a "mean world", for if all one sees is negativity on the news they will begin to believe the world is filled with negativity. This theory implies that the more time one would spend on media, the worse they perceive the world. The beliefs one has about the world around them are impacted by how much time they spend on mediated communication. When connecting cultivation theory to the concept of relationships it is possible that when constantly viewing relationship-centered media one will begin to have negative perceptions about their own relationships. Participants consented to complete a 10 to 15-minute online survey produced using Qualtrics. Participants were asked questions in Likert Scale-style format in order to gather data

about both their amount of media consumption and their level of relationship satisfaction using the Relationship Assessment Scale. It is expected that overconsumption of relationship-centered media will lead to negative perceptions about relationships.

Psychology

12:10pm-12:30pm

Body Image and Disordered Eating during the COVID-19 Pandemic

Presenter(s): Sara Iisaka

Advisor(s): Dr. David Frederick, Dr. Desiree Crevecoeur-MacPhail, Dr. Tara Gruenewald

The impacts of the COVID-19 pandemic have been felt globally and have presented great challenges to individuals in various ways. What is less acknowledged, is how the repercussions of the pandemic have impacted body dissatisfaction and eating disorders. With increased stressors, less access to social support, and heightened focus on body image concerns in the media, a perfect storm for body dissatisfaction and eating disorders has been created. The study aimed to understand the predictors for COVID-related body image concerns and how they may place individuals at greater eating disorder risk or exacerbate preexisting symptoms. US adults (N = 2133) were surveyed via MTurk (mean age = 41, SD = 12.4). Participants were asked to report their negative or positively perceived impacts of COVID on appearance evaluation as well as weight, fitness, and eating-related behaviors. Validated measures for eating disorders, exercise motivation, and internalization of appearance-related social media pressures were included. Negative perceptions of COVID-19 on participants' body appreciation, weight, fitness, and eating-related behaviors were positively correlated with eating disorder symptoms and severity and internalized appearance-related pressures from social media while positive and healthy motivation to exercise was negatively correlated with negative perceptions of COVID-19 on body image. There were also significant differences between men and women in their perceptions of COVID-19 on body image as well as eating disorder symptoms and severity. These findings illustrate the complex impact that the COVID-19 pandemic has had on individuals' body dissatisfaction and risk for eating disorders. In a time where salient media messages are promoting weight loss, exercise, and diet to combat the alleged "Quarantine-15," it is important to understand the potential repercussions of these messages in order to guide and support individuals' health and well-being through the pandemic and beyond.

AF 209C

Psychology

11:30am-11:50am

Personality and Sexual Satisfaction Among Women

Presenter(s): Kaylie Posen

Advisor(s): Dr. Desiree Crevecoeur-MacPhail, Dr. Tara Gruenewald

Previous research has examined the orgasm gap in which the large majority of heterosexual men reported experiencing orgasm during their most recent partnered sexual event compared to approximately 50% of heterosexual women (Herbenick et al., 2010). Additionally, Herbenick et al. (2010) found that there is a huge discrepancy between men's perceptions of if women orgasmed versus the actual reports of women experiencing orgasm. The objective of this study was to examine personality as one factor that may affect women's tendency to fake orgasms. One of the reasons for this discrepancy could be attributed to women faking orgasms. There are likely multiple motivations that affect women's tendency to fake orgasm. The present study was designed to assess whether the Big Five Personality Traits (Neuroticism, Extraversion, Openness, Conscientiousness, and Agreeableness) were associated with women faking orgasm. Additionally, this study drew upon the Five Factor Theory which states that a person's traits have an effect on their character adaptations (habits, skills, interests, attitudes, relationships). The results indicated a correlation between neuroticism and faking orgasm in which individuals with higher levels of neuroticism reported faking more orgasms. There were no correlations between any of the other variables. The results indicated a potential relationship between a personality trait and expression of sexual satisfaction as demonstrated by the tendency to fake orgasm.

11:50am-12:10pm

50 Shades of Orgasm: An Exploration of Sexual Behavior in Women

Presenter(s): Sara Henry

Advisor(s): Dr. Desiree Crevecoeur-MacPhail, Dr. Amy Moors, Dr. Tara Gruenewald

The orgasm gap is a phenomenon explaining the difference in orgasm frequency between heterosexual men and women (Mintz, 2017). The overarching goal of the present study was to examine the orgasm gap in women that identify with kink-related or non-traditional sexual behavior practices (BDSM, fetish, power play) versus women that participate in fewer kink behaviors or "vanilla" sexual practices. The proposed research study investigated orgasm experiences in relation to gender of primary sexual partner, sexual behaviors, and relationship status in female participants. The kink community has been relatively understudied in comparison to others, especially in terms of determinants of sexual satisfaction (e.g., orgasm rate). Kink-identified women were recruited through online forums and websites specifically related to the world of kink (Fetlife, Reddit, Facebook), while women that were not specifically open about kink online were contacted through other online forums. The methodology was conducted through a series of questionnaires about sexual orientation, relationship status, sexual behaviors, and orgasm consistency and satisfaction. The results of this study indicated that women who practiced kink behaviors regardless of gender of partner during sex had more orgasm satisfaction and frequency than women that do not practice kink. Secondly, women in the kink community practicing a greater variety or number of kinky behaviors orgasmed more frequently and had more orgasm satisfaction. The results of this study

indicated that a greater variety of sexual behaviors, specifically kink, was correlated to greater orgasm frequency. The hope is that this research will contribute to a deeper understanding of those who engage in BDSM-related practices and implications to closing the orgasm gap. In conclusion, incorporating pleasure-based models or information into sex education, such as BDSM practices and orgasm satisfaction, may be important in the future of human sexuality.

12:10pm-12:30pm

Assessing Attitudes Towards Sexual Orientations and Polyamory

Presenter(s): Meghan Flores

Advisor(s): Dr. Tara Gruenewald, Dr. Desiree Crevecoeur-MacPhail

A significant body of research has been conducted on attitudes about sexual orientation and attitudes about polyamory; however, not much is known about the intersection of attitudes regarding sexual orientations and preferences for polyamorous or monoamorous relationships. Therefore, this study aims to investigate the attitudes of college-age students towards different aspects of sexuality, including sexual orientations and sexual preferences. To conduct our study, participants were asked to engage in a short online survey to assess their perceived attitudes towards the morality of diverse sexual orientations and polyamory, as well as their perceived attitudes towards the potential association of sexual orientations and polyamory. In our results, it is expected that participants will report more negative attitudes regarding the morality of certain sexual orientations, specifically towards homosexual and bisexual individuals, as opposed to heterosexual individuals. Similarly, this study also expects to see more negative reports regarding the morality of polyamorists. In addition, it is expected that participants will report more negative attitudes about polyamory being recognized as a sexual identity in society. Finally, it is expected that participants will report bisexual subjects as most likely to participate in a polyamorous relationship, compared to homosexuals and heterosexuals. Through this study, we hope to gain a better understanding of the perceptions and opinions of college-age students at Chapman University with regard to sexuality, sexual orientations, and sexual preferences. Therefore, we hope to use this research to break down the barriers and stereotypes that people face in society regarding sexuality.

Artists listed in order of presentation.

AF 209A

Art

The Half-Life of Los Angeles
Artist(s): Morgan Grimes
Advisor(s): Julie Shafer
There are currently 96 commercial nuclear reactors spread across the United States, located in 30 different states. The first nuclear reactor built in the US was constructed in 1954 in Simi Valley California. Nearly all the nuclear reactors in the US were either built or proposed in the following two and a half decades. During the 1950s and 1960s nuclear power was still in its infancy and the general public was mesmerized by the wonders of this new form of energy. Throughout the 1970s, only about 20-30% of the general public opposed nuclear power. After the Three-Mile Island partial core meltdown, which occurred in 1979, and the Chernobyl nuclear disaster, which occurred in 1986, there was an increase in the public opposition to nuclear power to over 50%. During the 1980s nearly 60% of the planned nuclear reactors in the US were cancelled before construction had even begun.My intention with this body of work is to explore and highlight the history of public opinion of nuclear power in the United States. I strive to dig into the history of nuclear power in the United States and its intimate relationship with the general public. The visual photographs show the locations of 7 of Los Angeles' current, decommissioned, and cancelled nuclear reactors, only one of which continues to supply Los Angeles with power today. Each imposed nuclear reactor is made of infrared imagery of the same location, representing what cannot be seen but what could have been.

The One Who Won
Artist(s): Jeanna Polisini
Advisor(s): Julie Shafer
I am an adopted Asian American with an Italian last name who was raised in the Jewish faith. While I am one of the lucky ones, the One-Child Policy is responsible for how my life turned out. My intention is to confront the inhumanity of this horrific policy with my adoption story. Until policies personally affect someone's life, many people do not think twice about the other country's problems and their repercussions on a global level. For my senior exhibition, I created an autobiographical installation to explore my adoption story and how China's inhumane dictatorship. The full immersive installation will be in the Guggenheim Gallery from April 18-22, 2022. The walls will be covered with yellow, medical waste plastic bags to symbolize the discarded lives of millions of Chinese girls, all abandoned or sometimes killed. Juxtaposing the bags, there will be a large structure in the middle of the room to house a timeline of photographs to create a visual timeline of my life. These photographs include memories from the orphanage, adoption group, my caretaker, and meaningful milestones in my life. Despite China's goal of curbing their population of over a billion people, the policy stripped women of their rights as they were forced to sterilization and abortion. Baby girls were primarily aborted or put up for adoption since China's traditional culture has influenced its citizens to value sons over daughters. Unfortunately, this created an age and gender disparity as China's older generations are shrinking and the younger generation is

increasing. This is not only a project about being able to confront my past, but merges the environmental issues through the visual arts to advocate the detrimental effects of overpopulation.

I AM
Artist(s): Kaydance Osborne
Advisor(s): Micol Hebron
Using photoshop I created a poster relating to significant events in my life that represent three distinct chapters. This collage to me represents my journey of self discovery and how I continue to work on embracing who I am as a person. Throughout my whole life I struggled with who I was as an individual and being okay with standing on my own. I chose to organize my images of me in a scattered stair step pattern to represent the steps I took in my life to get to where I am now and the steps being scattered to represent how difficult it was to take each step. The image at the bottom left has part of my head missing and a tree branching from my brain. The tree represents my childhood because my childhood home had a tree in the front yard that I used to climb. I am also actively walking out of the poster representing the letting go of my childhood after my family moved. The second image of me that is in the rule of thirds position depicts me riding a flying mask in the sky while I am reaching out to my childhood. This symbolizes the pandemic and the idea that I had to grow up quickly. I lost a little of who I was and I continued to try and get back to my childhood self to compensate for struggling during the pandemic. Finally, the transparent version of me sprouting from the clouds represents me figuring out who I am and accepting who I am. I also have the Chapman panther paw on my cheek because I feel that I really learned who I was once I came to Chapman.

Time is going too fast
Artist(s): Hoda Mostafa
Advisor(s): Micol Hebron
Sagittarius for the centaurs, bunnies are my favorite animal. I wanted a more fantastical/renaissance theme. My story is about how I no longer am friends with that I thought I would be friends with forever- using a very simplistic narration format of begin --> middle --> end in thirds. Hence, the clock formats-- I wanted the person to feel smaller and smaller until you could almost not see them as to represent the grief of loss and the slow passage of time and events.

conscious shockness
Artist(s): Caleb Lachelt
Advisor(s): Micol Hebron
This collage is meant to tell a story about a few major events in my life in the past few years in an artistic and visually stimulating way. To begin, I used two of my favorite landscape photographs I've taken as the background and foreground for the collage, which created a surrealistic yet coherent base. Then, I used clouds from another photograph I've taken as well as a freeze frame from one of my skateboard tricks and added them into the top left. This is the first event of my life I wanted to convey, and it describes how I feel like I'm in the clouds when I skateboard. Next, I wanted to include perhaps the biggest event of my life, which was studying abroad in Hawaii during my first semester of college. To do so, I paired a picture of me in Hawaii with a png of the Hawaii islands. Then, I added my most recent big life event, which was purchasing my own first car. I found a picture of a car from the internet and inverted its colors, as well as

cutting a hole in the background and putting the car in it to make it look like it was breaking through the background. I took a selfie of myself to add to the car to make it look like I was driving. I also used the sunset from another photograph I've taken to place onto the windshield of the car. Finally, I included some funny pictures of my dogs in the foreground, orienting one so it looks like he is eating the car coming out from behind the background. Lastly, I added some extra flowers, leaves, and a drawing which balanced the image and made it more interesting.

Placidity Under The Stars
Artist(s): Hailey Ramos
Advisor(s): Micol Hebron
My collage is about the different stages of my life that I've lived through. It starts with my gradual transition into self-acceptance, growing from my trauma letting it be known instead, and reminding myself that I am a survivor of Sexual Abuse. I added a garden because it has been a dream space for me, a safe space in my mind whenever I'm in distress or need an escape from the real world. I tend to like the night sky better than the day, so I added the stars above and a comet, specifically Halley's comet since I have always felt drawn to it. I also wanted to add a symbol of my culture and family traditions starting with the sage and what our smoke represents from it. My family uses the sage to cleanse themselves from negative energy, purifying us and letting us start fresh, something that has recently been very important for me. I made my smoke a rainbow color because I like to think of it as a symbol of queerness as well, so in a way, it's me releasing my queer identity into the world to make it known, and also of obtaining good energy in the same time. The fox represents my spirit animal, protecting me and watching over me as it walks the garden arches. That's why I also decided to put one over me in one of my poses, as a way of showing it is guarding me in a sense. Overall, I wanted it to be a night theme dream that I would like to look back on as a comfort place, making it feel like a safe haven with the stars and comet protecting me in the sky and the fox and flower fields embracing me in the quiet earth.

Artists listed in order of presentation.

AF 209C

Art

to the moon
Artist(s): Sophia Mac Arthur
Advisor(s): Micol Hebron
My collage was inspired by the fantasy genre, and the idea of magic. I am a fan of the moon as a symbol. Until humankind was able to study it, the moon had a very mysterious aura surrounding it. I enjoy the mystical qualities of this natural phenomenon. I included the moon multiple times to invoke a surreal feeling. One of my biggest inspirations was the photographic work of what planets would look like if they were the same distance away from the planet as the moon was. Specifically, the image of Saturn is what inspired the large, ominous moon overlooking my collage. Another element that I had added in were the animals. The owl is a classic real-life creature that is associated with the fantasy genre. The idea of butterfly was inspired by the vast amount of monarch butterflies that I have seen around campus recently. I thought a butterfly with a shadow across the moon would be an interesting visual. The three photos of me are from moments of moving into my dorm, deciding to become a photographer, and visiting a farm. I placed them in the various treehouses that my collage features. I have always had a love of treehouses, and have been fascinated by the idea of a city where the population lived in the trees. They are such a unique form of architecture, and fit well into the fantasy world I imagined. The scene that I created has the setting of a forest, which is once again a part of the fantasy genre.

Everything Happens for a Reason
Artist(s): Ava Arteaga
Advisor(s): Micol Hebron
For my collage I included some of my interests and events that have happened in my life that have made a big impact in my life. At the top, I have a line of polaroids because I enjoy taking pictures on my polaroid camera my boyfriend got for me, and in those polaroids are a couple big events of my life and little memories that make me happy. The other photos I have altered/photoshopped and these photos represent me, what makes me happy, and what events happened in my life that led me to where I am now. These events also have made me who I am today and how proud I am to have accomplished some of these things. The people in my collage are all people who are very important to me and have made a great impact on my life and my decisions. Overall, this collage represents who I am as a person and what brought me to where I am today.

Trip Down Memory Lane
Artist(s): Gee Trevena
Advisor(s): Micol Hebron
While making my composition I wanted to work with themes of external and internal, with my main interests featured more prominently at the top of the collage with my love of music at the bottom. The lower portion of the composition has the same background with the same sky overlaid on top to show

that it's just as important to me as the elements shown above. It features my first amplifier (Fender), my Electric Fender Stratocaster, and my Acoustic Electric Martin guitar. On the road I chose three photos of myself when I was going through major changes; me during middle school when I started a band with my friends in middle school, me wearing my plague doctor costume due to how the pandemic affected me, and me during my high school graduation. I had my dog represent the teletubby baby from that children's show the Teletubbies because I used to watch it with my grandmother when I was young, and when I got my dog it had a huge impact on my life, hence why she takes up a large part of the composition. I thought making her speak would be too cartoonish compared to the rest of collage so I had her favorite things on her mind such as food and play time. The Slide warning path that's featured is actually a road I used to frequent that's near my home so I wanted to incorporate that as my bike rides used to be my escape whenever I felt stressed or overwhelmed. I love halloween so I also added bits and pieces of candy on the ground as well, so overall the collage is a perfect representation of things that embody me as a whole.

The Kollection of Kris
Artist(s): Kristiana Cruse
Advisor(s): Micol Hebron
This is a continuous narrative collage about major events in my life that have shaped me into the individual I am today. I made this collage with three specific key moments in mind - being able to attend Orange County School of the Arts for Visual Arts, graduation, and then meeting my significant other. In creating this, I especially made sure to create a composition that expresses playfulness, as well as my artistic background. I did this by drawing sketchy doodles all over my composition, with more emphasis on the sketches around the main tower of my high school campus. The artwork has bright colors and "childish" aspects in order to shape the theme of comfort, warmth, happiness, and overall feelings of joy. All images and objects that are being presented in this artwork have deep-rooted memories, which began during my middle school years, which was also the beginning of my art schooling journey. I chose my specific layout based on how I wished to portray these major events in my life. For the image of myself in the foreground, I wanted to put emphasis on this dreamlike fairytale love, therefore I placed myself and my partner in a playful manner looking up and down at one another. Similar to the other images of myself, I made sure to have energy and excitement for my art journey at OCSA and a happy yet maturing experience represented in my graduation photo. I also created a sense of balance in the overall composition by my favorite food, sushi, being on opposite corners of the piece - which was the final touch to add balance. The entire piece follows the rule of thirds in order to also create a balanced artwork.

Digital Arts

There to Here
Artist(s): Curren Taber
Advisor(s): Micol Hebron
This collage represents a continuous narrative of my life, emphasizing three stages: elementary school, high school, and college. The composition follows the rule of thirds, containing horizontal divisions to convey time (left-to-right) and vertical divisions to establish atmosphere (foreground to background). Using my age as the percentage basis for the frame's width, I allocated elements along the x-axis according to their relevance to that life stage. Thinking of the composition as a linear progression, the left edge of

the frame represents age 6, and the right edge represents my current age of 22. The separation of the foreground most clearly illustrates this idea with the schools of my academic career. Left-to-right, the foreground includes Stoneybrooke Christian School, JSerra Catholic High School, and Chapman University. A relevant photo of myself exists in these three time-based regions, along with symbolism for my life at that moment. For example, the left-hand side of the composition includes a portrait from kindergarten, partially covered by a pile of Lego bricks. Faded logos that shaped my childhood occupy the background, and a Bible verse blends with my hometown. Penned grades span across multiple composition divisions to represent my perfectionist personality. The center of the frame shows a shift in my interests and the impact that running made on my life during high school. A camera sits above the track and field, symbolizing my passion for filmmaking and photography. Moving toward the right side, I included a photo of myself with friends met through Chapman. This photo "stands" atop the Bible, representing God as a firm foundation for life. Additionally, the right-side includes a meditation app logo, a pixelated mask, an overlay of code from my studies, and a distorted jumbotron from the last pre-COVID-19 event I attended.

Vitruvian Me!

Artist(s): Lydia Wharton

Advisor(s): Micol Hebron

My collage is compiled of elements that have been important to me within my life and especially my childhood. I am definitely a kid at heart, which is why I incorporated two child-age versions of me, representing two significant elements of my interests. On the right hand side of the collage, little Lydia represents her connection to nature and naturally occurring things. I incorporated many natural elements which are nostalgic to me and relate to my childhood. For example, I included my childhood dog Cleo, my favorite planet Saturn, and my favorite flowers (which my mom always called "Freeway Daisies"). The little Lydia is shown holding a macaw, one of her favorite birds, and the Vitruvian Lydia in the middle holds a tiny little earth. These elements of nature have always been My collage is compiled of elements that have been important to me within my life and especially my childhood. I am definitely a kid at heart, which is why I incorporated two child-age versions of me, representing two significant elements of my interests. On the right hand side of the collage, little Lydia represents her connection to nature and naturally occurring things. I incorporated many natural elements which are nostalgic to me and relate to my childhood. For example, I included my childhood dog Cleo, my favorite planet Saturn, and my favorite flowers (which my mom always called "Freeway Daisies"). The little Lydia is shown holding a macaw, one of her favorite birds, and the Vitruvian Lydia in the middle holds a tiny little earth. These elements of nature have always been important to me, and signify my own connection to life and the naturally occurring. On the lefthand side, I incorporated another aspect of my interests: Art. As a kid, many of my hobbies were creative ones. This included playing piano and drawing (lots, and lots of drawing!) Many of the cartoons and movies I saw as a kid served as inspiration for these drawings, so I made sure to incorporate many of the characters I loved and drew influence from as a kid. The inclusion of the "Big Dipper" constellation is extremely significant as well. This constellation is an example of how humans find the art in naturally occurring things, how the human imagination perceives nature and makes sense of it. Lydia in the middle is also shown holding a Wacom tablet pen, representing my innate artistic nature and inclination to draw and create. The "Vitruvian Man" type of pose is also significant in terms of symbolism. Leonardo DaVinci created the Vitruvian man in order to interconnect man and nature. Humans, and by extension human's creations, are intertwined within nature and the universe. This symbolism is essentially what my collage is all about; my own connection between myself, nature, and my own perception of nature and creation inspired by nature.

Artists listed in order of presentation.

AF 209A

Art

Stages of Life Collage
Artist(s): Chelsea Tate
Advisor(s): Micol Hebron
My life started in Clearwater, Florida where I lived before moving north to Rhode Island and now I am student at Chapman University in Orange, California. Within each of these stages of my life one thing was consistent and that was the beach, I've always been close to it. It's a place that continues to be where my best memories originate. In creating this piece it only made sense that the beach would be the landscape at which these stages my life would be expressed upon. Time period is shown left to right, starting with myself as a toddler and ending with myself at my current age, 19. The blurred appearance of myself at this stage is representative of the current unknown next stage in life, a common feeling for many college students. The numbers found in the image have significance, 906, found at the bottom left, is the address of the house I grew up in, in Florida. 401, found in the center of the image, is representative of Rhode Island by its area code. This piece is literal in the way that it is a depiction of myself growing up. The added color and effects are inspired by the psychedelic qualities that the movie "The last Unicorn" contains. Although not a cinematic masterpiece it is a movie that is greatly attached to the remembrance of my childhood.

Continuous Narrative Collage
Artist(s): Olivia Brewin
Advisor(s): Micol Hebron
I created a collage using Adobe Photoshop that represents the places, people, and things that made me who I am today. These elements each have certain memories attached to them and are placed with a purpose. Every image, except for the angels, are my own personal photos. The element leading from the left corner to the middle is a cropped bridge from a picture I took in Freeport, Bahamas. This location is very special to me because it is my home away from home. My parents met and married in the small town of Freeport, and we religiously vacation there in the summers as a family. I made the artistic choice to leave the silhouettes of some family members walking into the distance. The sign that reads “Pinecrest Schools” in the foreground was the sign that I saw everyday for the first 12 years of my life. It wasn’t until I moved to public school when I realized how lucky I was to grow up in a great, intimate community. I still remember every single grade teacher that taught me, as well as the same 50 or so schoolmates I grew up with until the end of my school career there. Up in the sky in place of clouds, is my dog Pepper. Pepper has left an indelible mark on my family and she showed us how important it is to love rescue dogs who had previously been unloved by owners. For the images of significant moments, I included a picture of my younger self that was taken at my grandma’s small apartment in New York City, a picture of me from my high school graduation and a picture of me and my significant other, Palmer. I placed the toddler version of me above my elementary school at the beginning of the bridge which leads to me at graduation, representing my long journey through education. Three cupids are shooting their arrows towards the picture of Palmer and I, which was taken after reuniting for the first time in two years. He serves in the

military as an U.S. Army Ranger and is a significant part of my life since high school. I also decided to add in drawn stickers to stress the collage feel as art is a very important aspect in how I express myself.

A Film Fairytale
Artist(s): Megan Petroni
Advisor(s): Micol Hebron
As a means of research, I created a continuous narrative collage that studied characteristics and defining moments in my life that have changed and shifted my own perspective on growth and change. As a means of demonstrating my sense of creativity and character development, I found that photography and my passion surrounding the art of film was a major defining element in the path to finding myself artistically. However, many other components throughout elementary school, middle school, and high school played crucial roles in shaping the strong, willful, and open-minded individual I am today. The film, All the Bright Places, a sad yet heartwarming motion picture, addresses many important issues such as mental health awareness through life and death. However, although each viewing of this movie brings me to tears, the film never fails to make me smile and reminds me to cherish every moment in life. The places in this movie symbolize key moments of pure happiness which are portrayed as the background in this particular collage. I overlapped these various landscapes in a way that made the photos seem integrated into one another through a seamless transition. The photos I chose to include inside the film roll are either landscape photos I took on my camera or specific moments that were captured in photos that demonstrate how I have grown academically, socially, and creatively. The butterflies are a symbolic representation of the evolution of myself into the most authentic version of myself. I chose to include Poppies, the state flower as an element of where I come from and how I was raised. I have lived in California my whole life which has been a major defining element in my life based on the morals I have been taught and the lessons I have learned.

land of love date of kisses
Artist(s): Ru (Candace) Chen
Advisor(s): Micol Hebron
In this piece, “land of love date of kisses”, I hope to represent myself in a comical, whimsical collage. In the sky is Garfield, the cat, because I feel like I resonate with him the more and more that I get older. I think it is also hilarious to know that all of his thoughts are never said out loud and that he is just annoyed on the inside. The pinwheels that stick out of the mountains of the picture are a sort of symbol of my life. I have always really liked pinwheels growing up. One time, my mom knew how much I loved them and bought me a huge pinwheel; I wanted to include one on the collage as an homage to her. Another homage to my mother is are the Chinese stamps of her maiden name in the bottom and top corners of the picture. The background photo used in this piece is a picture that I took on a trip to Korea to visit some family. Korea is a place that I hold close to my heart because I used to go every year. The photo from my high school graduation that is above the water is a kind of way to show that I have reflected so much since my graduation from school then and the way that I have grown since. The photo booth photo that I included is from right before COVID-19 hit to which I have included the text, "oh how little does she know". From the time I was in quarantine to now, my life has changed 180 degrees. I think a major theme in my collage is "reflection" literally and figuratively. All of the included imageries are important times of my life and what I like to think about is the way that I have changed so much since each time.

Lows and Highs of Recovery
Artist(s): Kristiana Cruse
Advisor(s): Kirsten Everberg
This series is entitled "The Highs and Lows of Recovery". I started this series to explore the steps of recovery from addiction. I wanted to portray a narrative of this unknown woman and her journey. The two displayed are entitled, “Enlightment (2021)” and “Relapse (2021)”. Enlightenment is a piece about giving in to a higher power and putting one’s hardships in the hands of faith. Within recovery, faith is all that some people may have. I decided to make this painting bright so that it vibrates and yells at you that this woman has found her higher power to confide in. The woman and eye are in the center to show how this is significant, to show the power she is not only giving up but that she is gaining by choosing this faith. The next piece is entitled, Relapse. Relapse is a step in recovery that people rarely discuss. People fear relapse and may think those who relapse are weak, yet those who relapse are just as strong as individuals that do not. It is a part of the process and it should be spoken about. Addiction is difficult to overcome and is not a linear process. In order to portray how I view relapse and the stigmatization attached to it, I chose to have a dark color palette. The woman has a light shining on her with a monster reaching out to claim her. I created a darker composition and added this spotlight to signify how relapse grabs whoever it can see in the darkness. In order to drive the power that addiction has on an individual, the monster has relapse written in its teeth. This shows that there are multiple fears when it comes to recovery and this is one of the many battles addiction faces.

Artists listed in order of presentation.

AF 209C

Art

Mama
Artist(s): Hannah Scott
Advisor(s): Micol Hebron
“By writing herself, woman will return to the body which has been more than confiscated from her, which has been turned into the uncanny stranger on display” (Cixous, 1975). Through a depth of research into feminist perspectives on motherhood, I have created an art installation titled, "Mama". From my research, I have found many artists who make work about their experiences in raising children, women’s work and labor, and the trauma of giving birth. Louis Bourgeois, Natalie Loveless, Mierle Laderman Ukeles, Mary Kelly, and Jenny Saville are a handful of artists whose work on motherhood has greatly inspired me to question my own relationship between the free-spiritedness of being an artist, and the pressure to conform to the gendered expectation to pursue motherhood. Julia Kristeva stated that, motherhood is the sole function of the “other sex” to which women may confidently attribute their existence to (1985). The idea that my sole function as a woman is to rear children is incredibly stifling, and I have felt immense pressure throughout my life to be a mother, from people admiring how well I deal with children to being told I have “child-bearing hips” at the ripe age of 10. How I contend with the opposing goals to be both a mother and an artist are felt in this piece through the tension of dual forces, created by the difference between two birthing chairs and two video projections. Through my research, personal narrative, and creative practice, I look to address domestic stereotypes placed on women, and in particular women artists. As a continuation of my exploration of craft, I have used the methods of woodworking and video to address ideas of domestic labor and child-rearing. In this installation, I have shown an acknowledgment of patriarchal structures and how they affect women’s existence, while also claiming ownership over my own fate in a subversive manner. Taking inspiration from absurdism, surrealism, arte povera, and “Womanhouse”, "Mama" confronts the harsh realities of motherhood and gender roles.

Journey Through Lexs' Life
Artist(s): Alexis Carranza
Advisor(s): Micol Hebron
I decided to do a collage on a few events that are important to me that have happened in my life. I chose the mountains and the water as my background because I am from Colorado and all the life events I chose to add to my collage occurred in the mountains. I chose to add a raving background in the sky because I love going to EDM concerts and they are a big part of my life. I chose to add the group of girls I went on my Kairos retreat with because it was a life-changing experience that I will never forget. The part where there are two images of myself with the Colorado and California background define my transition from moving from Colorado to California for college. I put Colorado on the right and California on the left just because I went from my home to a strange place where I was going to be living for, for the next four years. This was a huge change in my life and something I’ll never forget either especially leaving my parents for the first time. I added a husky in the right corner because I got my husky two years ago. His name is Remington and he is one of the most loving and crazy dogs I’ve ever met. He’s my best friend and he just

makes my life so much better. All these images and symbols are part of my identity and I wanted to express that through digital media.

Digital Arts

The Simulation of Life
Artist(s): Raquel Rosenberg
Advisor(s): Micol Hebron
To understand Einstein's perspective, we need a working definition of reality, an algorithm, if you will, for determining what thmgs exist at a given moment. -Brian Greene, Fabric of the Cosmos. Nothing we believe to see right now is actually the reality. We never see things as they are happening. Does this mean if every light source in the universe disappeared, then our reality, our existence, would be nothingness? Anything you see right now has already hap- pened. You are not seeing the words on this page as they are now; instead, if you are hoiding the book a foot from your face, you are seeing them as they were a billionth of a second ago. -Greene This book inspired the art created. Everything you see is not truly reality. I created a simulated view of reality with pink clouds, chaotic news filling space in the sky, and colorful lava bursting out of a volcano. Life is a whole lot of imaginative mayhem.

A Sunset with Myself
Artist(s): David Yang
Advisor(s): Micol Hebron
This collage is composed of me at three major events in my life, along with attributes of my identity. The one in the background is me at my high school graduation, where I said goodbye to lots of my friends and a chapter of my life. The one in the midground is me meeting my cat. This was somewhat unexpected for me, as my parents said that we would not have any more pets after our last one, Snowy, a guinea pig, passed. However, it was a welcome surprise, and I am happy to have another companion with me in my life. The figure in the foreground with the thumbs up is me in Korea, specifically on Jeju island. This was my first time traveling somewhere outside of America, so it was great to explore both an unfamiliar country yet familiar, as my parents grew up there. The foreground is Jeju Island, the midground is a desert setting, and the background is a sunset. These were landscapes I liked, as I really enjoyed the setting of Jeju Island with all its statues, the desert with its barebones element, and the sunset for its vibrant spectrum of colors in the sky. The three other icons on the collage represent parts of my identity. The Korean symbol at the top left is my surname, a basic element of my identity. The pen drawing a squiggly line represents one of my ongoing passions in my life, drawing, while the cartoon tiger, Hobbes from Calvin and Hobbes, represents my love of comics and my spark to draw. All in all, this collage represents my experiences of the highlights of my life, along with parts of my identity.

3D Techniques in Blender
Artist(s): Curren Taber
Advisor(s): Micol Hebron
Through my independent research course, “ART 491 3D Techniques in Blender,” I explore the fundamentals of 3D digital art using Blender. Inspired by Andrew Price’s 4-week Blender curriculum, the

course outline includes a combination of video lessons and hands-on exercises related to a complete 3D workflow. Each week of the semester-long course explores a new topic, such as lighting, materials, modeling, sculpting, texturing, composition, environment creation, character rigging, aesthetics, etc. As I already knew the basics of using Blender, I tailored the focus of this course to an intermediate level. Computer-generated imagery takes up more and more of the digital media landscape as technology progresses. Popular brands use 3D renderings for product commercials, home designers use them for architectural visualizations, and the metaverse uses these renderings to connect people in virtual spaces. Through experimentation, concept development, and self-guided projects, this course encourages creativity while providing software-independent essentials for 3D art creation. On a typical week, the course involves watching one or more videos and completing a relevant homework exercise. Week 7 acts as a midterm, incorporating lessons I learned from the weeks before to replicate an object in Blender. The final project combines everything learned from the course and challenges me to make an environment scene with a character. This course aims to introduce me and any other student to the entire 3D art process, offering an opportunity to improve their skills and understanding of specific subsets. After completing the study, the student can use their projects for their portfolio. They will also have a digital log that documents each week's progress.

The Half-Life of Los Angeles
Morgan Grimes
Wooden frames, Photographic Prints

The One Who Won
Jeanna Polisini
Installation

I AM
Kaydance Osborne
Digital InkJet Print

Time is going too fast
Hoda Mostafa
Digital InkJet Print

conscious shockness
Caleb Lachelt
Digital InkJet Print

Placidity Under The Stars
Hailey Ramos
Digital InkJet Print

to the moon
Sophia Mac Arthur
Digital InkJet Print

Everything Happens for a Reason
Ava Arteaga
Digital InkJet Print

Trip Down Memory Lane
Gee Trevena
Digital InkJet Print

The Kollection of Kris
Kristiana Cruse
Digital InkJet Print

There to Here
Curren Taber
Digital InkJet Print

Vitruvian Me!
Lydia Wharton
Digital InkJet Print

Stages of Life Collage
Chelsea Tate
Digital InkJet Print

Continuous Narrative Collage
Olivia Brewin
Digital InkJet Print

A Film Fairytale
Megan Petroni
Digital InkJet Print

land of love date of kisses
Ru (Candace) Chen
Digital InkJet Print

Lows and Highs of Recovery
Kristiana Cruse
Digital Inkjet Print of Original Acrylic paints

Mama
Hannah Scott
Wooden birthing chairs

Journey Through Lexs' Life
Alexis Carranza
Digital InkJet Print

The Simulation of Life
Raquel Rosenberg
Digital InkJet Print

A Sunset with Myself
David Yang
Digital InkJet Print

3D Techniques in Blender
Curren Taber
Digital InkJet Print

Art

1. ***Sweet Bliss***
   Presenter(s): David Echevarria
   Advisor(s): Micol Hebron

I tried to implement as many ideas from the worksheet while making it all fit together. The movies heavily inspire my college. I think about the Star Wars films a lot. I used a mix of the different ideas on the worksheet, such as the moon in the sky, which refers to the blue moon I saw on Halloween two years ago. The beach landscape ties into things like when I did water polo and swimming for two years, and I enjoy significant open landscapes. I added aesthetic things into the piece: the sky with the nebula behind the clouds and the barn owl flying in the air. With the images of me, I wanted to try and make it seem as if there were three versions of myself: having one side be in black and white, one in color, and one that has a balance of both. The one on the left is supposed to be about when I broke my arm and was in a sling for a week. It was my dominant arm, so it was challenging since I couldn't draw or write, and I felt like I had lost a bit of myself. The image of me in color is supposed to represent me when I graduated from High School, which was a significant and happy moment in my life not only because I was graduating but because I was heading to Chapman. Hence, I thought that would be the most optimistic version of me and the most hopeful. The one in the middle is supposed to be me now as it's neither bright nor dark, so it's almost as if I'm living in the moment. It relates to the rule of thirds and acts as a past, present, and future.

Biochemistry and Molecular Biology

2. ***Structural and Biochemical Characterization of Lactobacillus helveticus Chlorogenic Acid Esterase***
   Presenter(s): Tracie Okumura
   Advisor(s): Dr. Cedric Owens, Christine Loverde

Chlorogenic acid (CGA) esterases are industrially relevant hydrolases that cleave CGA into caffeic acid and quinic acid. CGA esterase belongs to a family of enzymes that are capable of hydrolyzing alkyl chain esters of hydroxycinnamic acid derivatives. The structural and biochemical characterization of bacterial CGA esterases is incomplete. We are interested in the CGA esterase derived from Lactobacillus helveticus (Lh). After cloning the CGA esterase gene into E.coli, we grew and expressed the protein, then purified it. We ran different biophysical experiments, including circular dichroism (CD) and dynamic light scattering (DLS) to characterize the purified Lh CGA esterase. These experiments showed that the protein is a mix of alpha helices and beta sheets, and that the melting point is 65°C. Michaelis-Menten kinetics assays demonstrated that the enzyme is most active at neutral pH, and that there is a small temperature dependence of the activity. We found that the Lh CGA esterase is the most active esterase known to date with a Km of 0.081 mM and a Vmax of 0.0496 mM/min. We also solved the crystal structure of this enzyme. The structure revealed a deep substrate binding cleft and features a small insertion domain above its active site. Our structure mostly agrees with the first characterized bacterial CGA esterase, which was from L. johnsonii. Compared to Lh CGA esterase, L. johnsonii CGA esterase is much less active. Future work will investigate which structural features are responsible for the unusually high activity of Lh CGA esterase.

3. ***Crystallization of Lactobacillus Helveticus Chlorogenic Acid Esterase***
   Presenter(s): Allison Tajii
   Advisor(s): Dr. Cedric Owens, Christine Lo Verde

Chlorogenic acid (CGA) esterases are potentially important industrial enzymes capable of hydrolyzing CGA into caffeic and quinic acid. CGA esterases are found in bacteria and fungi, yet bacterial CGA esterases have been studied much less than their fungal counterparts. In this work we present the crystal structure of Lactobacillus helveticus CGA esterase. This is only the second bacterial CGA esterase to have its structure solved. L. helveticus CGA esterase was expressed recombinantly in E. coli and purified to homogeneity. We screened approximately 500 different crystallization conditions and discovered that crystals formed in 50 mM citric acid, pH 4.5. We next improved crystal growth by optimizing pH and protein concentrations, obtaining large crystals that were used for diffraction experiments. The highest quality crystal diffracted to 2.2 Angstrom, allowing us to obtain a high resolution structure. As expected, CGA esterase forms an alpha/beta hydrolase fold and is dimeric. A notable feature in an insertion domain that present above the active site that is not found in most hydrolases. Overall, the structure is similar to that of CGA esterase from Lactobacillus johnsonii but very different from fungal CGA esterases. Our work suggests that bacterial and fungal esterase have fundamentally different structures and that the insertion domain may be a distinguishing characteristic for bacterial CGA esterases.

4. ***How Exosomes from Tumors Provoke Field Cancerization of Non-Cancerous Cells in the Breast***
   Presenter(s): Jillian Fahey
   Advisor(s): Dr. Marco Bisoffi

Breast cancer affects 1 in 8 women in their lifetime, with many patients experiencing recurrent tumors that are difficult to prevent without complete breast removal. High rates of recurrence are likely explained by field cancerization, where healthy cells become cancerous from their adjacent tumors. Exosomes secreted by all cells, including normal, pre-malignant, and overtly cancerous cells are thought to be a key mechanism of field cancerization, representing a possible pathway between tumorous and healthy cells. Accordingly, we aim to explore the pro-tumorigenic effect of cancer exosomes on non-cancerous breast epithelial cells with respect to their migration, proliferation, and gene expression, indicative of field cancerization. In the current study, we hypothesized that exosomes produced by primary breast tumors (MCF7 cells) induced field cancerization in healthy, adjacent breast tissue (MCF10A breast epithelial cells). The MCF7 exosomes were isolated by ultracentrifugation. Qualitative Western blot (WB) and quantitative reverse-transcriptase polymerase chain reaction (qRT-PCR) both revealed the presence of the known tumorigenic proteins fatty acid synthase (FASN) and androgen receptor (AR) in exosomes. Non-cancerous MCF10A cells were subsequently treated with MCF7 exosomes and the oncogenic effect on protein expression was determined by antibody array analysis. This confirmed MCF7 exosomes' ability to induce pre-malignancy in non-cancerous MCF10A cells. Most notably, CXCL8/IL-8 and ProgesteroneR/NR3C3-5, two proteins associated with cancer cell growth, showed greater than 70% increases in expression in response to treatment with MCF7 exosomes. Taken together, our results suggest that exosomes provoke field cancerization by upregulating cancerous proteins in non-cancerous breast cells. These findings may lead to improved detection of recurrent tumors in the same breast without the need for complete breast removal.

Biological Sciences

5. ***Hagfish Epidermal Thread Cell Thread Properties***
   Presenter(s): Hannah Campbell
   Advisor(s): Dr. Douglas Fudge

Hagfish are primitive vertebrates with a defense mechanism of producing slime to clog their predators' gills. This slime is comprised of mucus, threads, and seawater. The threads in this slime are stored as highly coiled skeins in gland thread cells (GTCs) in the hagfish's slime gland. Another type of thread cell called an Epidermal thread cell (ETC) exists, and is embedded throughout the epidermis. ETCs also contain threads, albeit smaller and less complexly coiled than the ones from GTCs used in slime. Little is known about the structures and functions of ETCs. They may have served as an evolutionary precursor to GTCs and their threads; they may play a role in wound response when damage to the skin ruptures them and releases their threads; they may actively release threads onto the hagfish's skin where they interact with granules of unknown identity, also coming from ETCs, to ward off predators if said granules are noxious. Much is uncertain and still being investigated. Specifically, this study will investigate the protein structures of ETC threads in relation to GTC threads. GTC threads, when stained with Congo red and observed under a polarizing microscope, have a birefringence that can be seen where they have been stretched— where their alpha-helix structure has become a beta-sheet. ETC threads can be collected by scraping a hagfish's skin with a glass cover slip, and are found on the resulting microscope slide in both coiled and stretched states. By staining these slides with congo red and examining them under a polarizing microscope, it will be seen whether their protein structures behave in the same way as GTC threads'. This could provide evidence to either support or weaken the hypothesis that ETC threads were an evolutionary precursor to GTC threads.

6. ***The Biomechanics of Hagfish Eggs***
   Presenter(s): Zachary Baker
   Advisor(s): Dr. Douglas Fudge

Since their discovery in 1856, scientists have noted the peculiar morphology of hagfish eggs, which are tipped with mucous-covered clusters of hooked filaments. Each egg is around 2 cm in length with hooked filaments that extend 200 to 400 microns out from the tips of each egg and are 20 microns wide at the stalk and 60 microns wide at the mushroom cap. The hooked filaments, also referred to as anchor filaments, join pairs, strings, or clumps of hagfish eggs on deep ocean sediments, but the biomechanics of this adhesion are not well understood. In the current study, we measured the force required to separate the hooks adhering a pair of hagfish eggs and used microscopy to study the structure of individual hooked filaments. We measured the force required to separate two hagfish eggs. 0.2 N is the average force for separating two hagfish eggs in seawater, a force like separating a piece of Velcro. When running the tests multiple times in water, changes in force attachment were minute. Similar tests were conducted in air, finding maximal forces when the filaments are dry to be 0.7 N the first time the eggs are separated. Subsequent attachments with the same two eggs yielded substantially lower forces at 0.2 N. Breaking strain tests were conducted by stretching individual filaments until they break which provides data on the stress and strain properties of the hooked filaments. Attachment studies revealed that the mucous occasionally found on the hooked filaments prevents them from attaching to other eggs. Ongoing work is exploring the function of the hooks in nature and the ontogeny of the eggs.

7. ***Comparative Analysis of the Canine Nasal Cavity by Vertical or Horizontal Cribriform Plate Angle***
   Presenter(s): Alexa Ortega
   Advisor(s): Dr. Lindsay Waldrop, Dr. Nicholas Hebdon

Throughout the evolution of the family Canidae, there is a continuous belief that canines have an exceptional olfactory system for heightened sense of smell. However, while the trait is highly regarded, the exact role of nasal morphology is understudied. We aim to investigate the angle direction of the cribriform plate by basal lamellae within various species of Canidae to understand the morphological differences between anatomical spaces. To understand the horizontal or vertical passage of air and how it impacts the olfactory accessory, the identification of the angle that air bounces through the nasal cavity between craniofacial ratios is measured. To develop this method, we will employ 7 Computerized Tomography (CT) scans of a German Shepherd, Chow Chow, Pug, English Bulldog, American Bulldog, Russian Wolfhound, and a Wolf from the LA County Natural History Museum. From these we create 3D models of these skulls within SlicerMorph to outline the placement of the Cribriform plate, nasal cavity, and turbinates. The cribriform placement varies from Dolichocephalic species to Brachycephalic breeds. Cribriform plate has multiple holes for olfactory axons to contact turbinates thus connecting the olfactory system to the brain. Terminals have horizontal area with limited vertical area by muzzle length. From our sample, the Pug's cribriform plate displays turbinates that rise up towards the brain area by their shortened muzzle. In this study, we determine the movement of the air following the vertical angle of the cribriform plate and where the air is diverted from Dolichocephalic to Brachycephalic breeds. In previous studies, the air flow direction displays rejection of sharp turns however, the natural flow for canine nasal cavity is different then the results of the sharp airway movement. In the future, we will expand our data set to various Canidae species and integrate them into computational fluid dynamics analysis.

Chemistry

8. ***Alkyne Hydrosilylation Using Cationic Zinc Bistriflimide Complexes***
   Presenter(s): Alexa Wilson
   Advisor(s): Dr. Allegra Liberman-Martin, Zach Thammavongsy

Mono-cationic, low coordinate zinc becomes more Lewis acidic when paired with weakly coordinating anions. In this work, we have investigated organozinc complexes stabilized by the bistriflimide (NTf2–) anion. A (C6F5)ZnNTf2 catalyst was synthesized in one step from commercially available starting materials and was characterized by 1H and 19F NMR spectroscopy. Alkyne hydrosilylation catalysis catalyzed by (C6F5)ZnNTf2 was studied for a variety of silane and alkyne substrates.

9. ***Effects of Dissolved Sulfate on the Sorption And Retention Of Cu(II) And Zn(II) to Suspended and Aggregated Iron Oxyhydroxide Nanoparticles***
   Presenter(s): Emma Kocik
   Advisor(s): Dr. Christopher Kim

Metal contamination poses a potentially significant threat to the health of humans and the environment, particularly as a result of mining and industrial activity. Iron oxyhydroxide nanoparticles (NPs) and their aggregates are known to serve as effective sorbents of metals in aqueous environments. However, it is less clear what occurs to metals sorbed to these NPs aggregates with increasing salinity, which is of importance when considering metal contaminants flowing from freshwater sources towards the ocean. In this study,

the influence of sulfate, the second most common anion in seawater, on the retention of metals sorbed to iron oxyhydroxide NPs and their aggregates is investigated. Macroscopic batch uptake experiments were conducted on suspended monodisperse NPs and NPs aggregated by increased pH, ionic strength, and temperature to measure the adsorption and retention of dissolved Cu(II) and Zn(II) at sulfate concentrations ranging from 0-0.30 M using inductively coupled plasma optical emission spectrometry (ICP-OES). Results indicate significantly enhanced retention of Cu and Zn upon the introduction of sulfate at 0.03 M, and a continued gradual increase with further increase in sulfate concentration. Extended X-ray absorption fine structure (EXAFS) spectroscopy was also applied to select samples to determine changes in Cu(II) or Zn(II) coordination environment with increasing sulfate. Combined results suggest that sulfate plays a dual role in both reducing surface charge repulsion and possibly initiating tertiary surface complexation, which together aid to increase metal adsorption and retention to NP aggregates.

10. ***Effects of Aggregation Through Freezing and Drying On Zn(II) Adsorption/Retention to Iron Oxyhydroxide Nanoparticles***
    Presenter(s): Abigail Kim
    Advisor(s): Dr. Christopher Kim

Iron oxyhydroxides are widespread and naturally occurring in surface aqueous systems as fine-grained, sometimes nanoscale particles. Due to their small size, high surface area, and chemical reactivity in their natural state, they also act as highly effective sorbents for dissolved metals, largely through (ad)sorption processes. Under various geochemical conditions (such as changes in pH, water salinity, and temperature), the nanoparticles aggregate, affecting their sorption and retention capabilities and increasing the complexity of the interactions between dissolved metals and the nanoparticle aggregates. The impacts of particle aggregation at the nanoscale on sorption/retention properties are poorly characterized; therefore, understanding these effects requires the exploration of nanoparticle aggregation mechanisms and metal ion speciation at both the macro and atomic scale. We investigated the effects of partial/complete nanoparticle suspension freezing and drying on nanoparticle aggregation and the subsequent sorption to and retention of Zn(II) onto those aggregates through a combination of macroscopic batch uptake experiments and X-ray spectroscopic analysis. Zn(II) adsorption/retention behavior was assessed through batch experiments and inductively coupled plasma-optical emission spectrometry (ICP-OES) and Zn(II) speciation was examined using extended X-ray absorption fine structure (EXAFS) spectroscopy. ICP-OES analysis yielded a decreasing trend of initial uptake of Zn(II) indicative of lowered surface area. The aggregates showed an increase in Zn(II) retention, however, likely due to sorption within inter-particle nanoporous spaces. EXAFS spectroscopy showed variations in zinc speciation that indicate a variety of Zn(II) sorption complexes, with the more strongly-bound species left after a pH-based desorption step. These studies better inform our understanding of (ad)sorption/retention capabilities of the nanoparticles and their aggregates and the optimization of their use in remediation of contaminated aqueous systems.

11. ***Tuning the Geometry and Electronic Structure of Core-Shell Plasmonic Nanoparticles***
    Presenter(s): Ishaan Shah, Chelsey Cortes, Gabby Montgomery, Stephanie Hoang
    Advisor(s): Dr. Jerry LaRue, Bingjie Zhang

The chemical reactions that take place in petroleum industries and automobile engines are significant contributors to carbon monoxide (CO) emissions. CO oxidation involves formation of CO2 upon reaction of CO with atomic oxygen. The methods used by petroleum industries to produce crude oil, are energy

exhaustive; therefore, there is a need to develop more energetically efficient methods to produce hydrocarbon fuel. Core plasmonic metal surfaces can produce excited electrons and can be coupled to high energy electronic states of a metal shell and subsequent reactants to facilitate excited state chemistry. To investigate how these catalytic metal surfaces can enhance the selectivity of chemical reactions, 18 nm Au and Ru/Au NPs were synthesized at 1/1. 2/1, and ½ molar ratios. The structure and composition of the catalysts were then characterized through Ultraviolet-Visible Spectroscopy (UV-vis), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), and Energy Dispersive X-Ray Spectroscopy (EDS) to understand whether they were ideal catalysts. A photoreactor chamber will be used to test the photochemical activity of bimetallic nanoparticles for CO oxidation and hydrogenation reactions. The geometry and electronic structure of metal catalysts were tuned for enhanced reaction outcomes for CO oxidation and hydrogenation reactions.

12. ***Excited Electron Chemistry on Bimetallic Tintantium Nitride Plasmonic Core-Shell Nanoparticles***
    Presenter(s): Chelsey Cortes
    Advisor(s): Dr. Jerry LaRue

Catalysts are integral to many chemical reactions as they reduce energy consumption and minimize pollution. Modern catalysts, however, are not selective nor efficient enough to satisfy some of today's global challenges and, in some cases, can even lead to an increase in pollution. The Petroleum industry, for instance, is one of the most significant contributors of carbon monoxide pollution and hydrocarbon emissions attributable to the incomplete combustion of petroleum. By coating plasmonic titanium nitride nanoparticles with an active transition metal, we aim to create highly selective and active plasmonic photocatalysts. These promising novel catalysts can potentially be utilized to carry out excited state chemistry reactions and may be used to mitigate carbon monoxide pollution in an environmentally friendly and cost-effective manner. This works because when the plasmonic metal core is excited by light and its plasmon resonances decay, it creates highly energetic "hot" electrons that can promote excited state reactions, while the transition metal shell functions to enhance the selectivity and efficiency of the reaction. This project aims to understand how the geometry and electronic structure of photocatalytic surfaces can be tuned to allow for the conversion of carbon monoxide into carbon dioxide or methanol. We have synthesized and characterized titanium nitride core nanoparticles with a transition metal, ruthenium or rhodium, shell and will be studying the photocatalytic efficiency of the core-shell nanoparticles through hydrocarbon and oxidation reactions. These bimetallic core-shell nanoparticles lay the foundation for the next generation of green photocatalysts.

13. ***Mechanism of HOCl-Mediated Oxidation of Two-Thiolate Zinc Complex***
    Presenter(s): Natalie Saadeh
    Advisor(s): Dr. O. Maduka Ogba

Bacteria harness zinc thiolate complexes to sense and respond to strong oxidants (e.g., hypochlorous acid) produced by animal hosts. Studying this mechanism would help develop a better understanding of how microorganisms navigate host systems. In this study, we investigate the mechanism for the HOCl-mediated oxidation of a two-thiolate zinc complex. Quantum mechanical calculations were used to determine the most stable geometries of the ground and transition states in order to create a complete reaction coordinate diagram of the oxidation process. Insights from this study would provide a greater understanding of how zinc makes sulfur compounds more susceptible to oxidation, and more generally how metals can be used to control the reactivity of sulfur containing compounds.

14. ***Colored Dissolved Organic Matter (CDOM) in the Newport Back Bay***
    Presenter(s): Kaitlyn DiCostanzo
    Advisor(s): Dr. Warren De Bruyn

Dissolved organic matter (DOM) is a part of the carbon pool in aquatic ecosystems. Carbon is transformed in these aquatic systems via photolysis, which is the biological and photochemical mineralization of DOM. It is also transformed through biological processes like decomposition and respiration, as well as physical processes like flocculation and settling into sediments as a carbon sink. These photochemical, biological, and physical processes affect DOM's molecular characteristics and bioavailability, and therefore produce a range of reactive transient species and small volatile organic compounds that impact aquatic biogeochemical cycles. Chromophoric dissolved organic matter (CDOM), the light-absorbing component of dissolved organic matter (DOM), provides protection for microorganisms and drives photochemistry in these systems. We have measured the optical properties of water samples collected from three different sites in the Newport Back Bay to characterize the CDOM content of the estuary. These three sites vary in terms of location and what impacts them, whether it be oils from boats in the marina or water flow from a creek. The optical properties measured from the water samples collected from the three sites include absorbance measurements, three-dimensional steady state excitation emission fluorescence spectra (EEMs), and time resolved fluorescence measurements. A range of fluorescence indices have also been calculated. Trends in optical properties associated with changes in the amount of CDOM, CDOM sources, and CDOM processing will be presented and discussed.

Communication Sciences and Disorders

15. ***Diversity of Mother-Infant Interactions and Vocabulary Development in Infants with Early Cochlear Implantation***
    Presenter(s): Matthew Kim
    Advisor(s): Dr. Mary Fagan

Infant vocabulary size is correlated with both the quantity and diversity of language interactions between mothers and infants. The more diverse the mother's language, the more developed the baby's vocabulary, which influences later linguistic and academic achievement. Vocabulary development is made of two components: vocabulary comprehension and vocabulary production. Vocabulary comprehension is defined as an individual's ability to understand the meaning of words. Vocabulary production is defined as one's ability to use labels and describe a stimulus. Most infants with cochlear implants have less hearing experience than hearing infants of the same chronological age. Chronological age is defined as an individual's age from birth. Hearing age is defined as the hearing experience of an individual. The hearing experience of infants with cochlear implants begins when they receive cochlear implants. Infants who received cochlear implants in the first or second year tend to have smaller delays in vocabulary acquisition than infants who received their cochlear implant after the second year. Although studies have analyzed vocabulary delay in children with cochlear implants, few have studied maternal language and vocabulary development for infants with cochlear implants in the first year. Our research project examines infants' language and communication skills and the influence of maternal language on vocabulary development. Using the MacArthur-Bates Communicative Development Inventory, the vocabulary size of infants with and without cochlear implants was compared to their hearing age and their chronological age. The goal of this study is to examine the influence of maternal language on vocabulary development in infants who received cochlear implants at 13 months of age or earlier.

Economics

16. ***Will Genius Fail? The Effect of Aging on Fear of Financial Collapse***
    Presenter(s): Peter Cline
    Advisor(s): Dr. Ann Gordon

From the fall of Long Term Capital Management in 1998 to the housing derivative bubble of 2008, financial collapses have caused catastrophe in the United States. In this paper, I examine the correlation between age and fear of financial collapse. Scholars have examined the correlation between age and risk aversion and the correlation between past financial collapse and stress; however, determining age's effect on fear of financial collapse provides scholars and fund managers alike with important insights into the aging investment mindset. This study is conducted with data from the Chapman Survey of American Fears 2020/2021 edition, a representative national sample of United States adults. I expect a strong relationship between age and fear of financial collapse due to experience in prior recessionary conditions and a higher risk aversion with impending retirement. This work dissects consumer sentiment as it connects age and fear of economic collapse, providing scholars and finance professionals with a discussion of the causation of changing risk aversion and investment allocations with age.

Environmental Science and Policy

17. ***Particle-Size Dependent Trends in Arsenic Bioaccessibility Through In vitro Extractions of Mine Wastes***
    Presenter(s): Micah Char
    Advisor(s): Dr. Christopher Kim

The mining and processing of gold and silver in the Mojave Desert, California has generated vast quantities of mine wastes containing elevated levels of several trace elements, including inorganic arsenic (As). Although regulatory agencies typically utilize bulk As concentrations to estimate exposure risk, simulated gastric fluid (SGF) extractions represent a more physiologically-relevant metric by which to assess As bioaccessibility and potential exposure. Additionally, physicochemical characteristics controlling As bioaccessibility associated with particle size can be critically important yet are not often systematically considered when estimating exposure risk. Processed mine tailings and unprocessed waste rock from six former mine sites in the Mojave Desert region were physically separated into 11 discrete size fractions and analyzed for initial As concentration and reactive surface area before subsequent exposure to both in vitro SGF and water leach extractions. Mine tailings and waste rock samples exhibited distinct trends across both extraction analyses. Arsenic bioaccessibility, expressed as a percentage of As released in SGF, was moderately to strongly correlated with reactive surface area (R2=0.27-0.91, avg. 0.71). When bioaccessibility was expressed as As concentration released in SGF, initial As solid concentration exhibited the strongest positive correlation (R2=0.83-0.91). Stepwise linear regressions showed that reactive surface area, initial As concentration, and water solubility, respectively and in order of importance, explained most of the variation of As bioaccessibility across sample types. Differences in arsenic speciation and physical encapsulation of As may explain the remaining unaccounted variability in As bioaccessibility.

Film

18. ***Like Tears in Rain: An Analysis of the Overlooked Disability Stories in Fantasy and Science Fiction Films and Television***
    Presenter(s): Laine Marshall
    Advisor(s): Dr. Nam Lee

Although fantasy and science fiction media offer viewers an exciting view into worlds and characters unlike our own, they reflect the world around us. When analyzing fantasy and science fiction film and television through the lens of Disability Studies, it becomes clear that these two genres are uniquely comfortable showing disabled characters and telling disabled stories while still falling into many of the problematic pitfalls when representing disabled characters. By analyzing films like "How to Train Your Dragon" and "Mad Max: Fury Road" and television shows like "Star Wars: The Clone Wars" and "The X-Files," a series of problematic character design ideals and narrative tropes begin to emerge. Because film is an inherently visual medium, character designs are used to immediately signify a character's personality and ethics (especially in animation), but this often means using a disability as a means of reflecting an inner evil. Additionally, the general public's lack of familiarity with many disabilities is exploited by film and television and used as a scary element of the unknown ripe for narrative evil. The imaginative nature of the fantasy and science fiction genres takes character designs and narratives surrounding good and evil to an extreme not seen as commonly in other genres. Disability representation in film and television is slim, only representing 2.8% of broadcast series regulars on television in 2021 according to a study by GLAAD. When representing disabled characters and their stories, pieces of fantastical filmic media hold both great power and responsibility regarding the public outlook on real disabled people due to their genre-specific grandeur and place within pop culture's small pool of disability representation.

Health Sciences and Kinesiology

19. ***Exploration of Mindfulness Meditations and Effect on Attentional Awareness***
    Presenter(s): Alexa Hallock
    Advisor(s): Dr. Manjari Murali

Mindfulness meditation practices are traditionally designed to cultivate mindful awareness and have been shown to have numerous benefits, including attentional awareness (Norris et al., 2018). In the current self-study, the effects of two Mindfulness Programs on attentional awareness were observed using the Mindful Attention Awareness Scale (MAAS) at four different time points, once before and once after the completion of each course. Chapman's Fish Interfaith Center's Mindfulness Certification Course is a 6-week mindfulness program taught by Julie Artman over zoom. The Koru Basic course, developed at Duke University, is a 4-week mindfulness program taught by Dr. Dr. Manjari Murali over zoom. In addition to one live class meeting per week, both programs require that students meditate on their own for at least 10 minutes every day. This self study will compare the outcomes of both mindfulness programs, and determine how they each contribute to attentional awareness based on MAAS scoring. It is hypothesized that the Koru Mindfulness Program will be more effective than Fish Mindfulness Course in increasing accountability for frequent meditation, so that the difference in MAAS scores before and after the Koru Mindfulness Program will be greater than the difference in scores before and after the Fish Interfaith Mindfulness Certification Course. Preliminary data has shown that MAAS scores after the Fish Interfaith Mindfulness certification course have increased. The Koru Mindfulness program is currently underway and results will be available before the Symposium.

20. ***Can Mindfulness-based Meditation Practices Prove to have a Positive Effect on Academic Performance and Progress?***
    Presenter(s): Neha Upponi
    Advisor(s): Dr. Manjari Murali

Research indicates that the incorporation of mindfulness meditation in daily student life can improve their academic performance, specifically in short-term academic endeavors (Mai, 2018). To independently validate this finding, I performed a self-study to compare the effects of two different Mindfulness Programs on my academic performance using practice Generalized Record Examinations (GRE) at three-time points. Timepoint T1 took place before the start of Chapman's Fish Interfaith Center's 6-week Mindfulness certificate course. During this course, different mindfulness techniques such as anchoring, walking meditation, equanimity and balance, and loving-kindness were taught. Timepoint T2 took place after completion of this first course and before the start of the 4-week Koru Basic course, developed at Duke University. The Koru mindfulness course had weekly reading assignments; and taught mindfulness techniques such as dynamic breathing, gatha, guided imagery, and labeling feelings. Timepoint T3 took place after completion of the Koru Basic course. Both the Fish and Koru courses required participants to attend once weekly live classes over Zoom, meditate daily for at least 10 minutes, and maintain a daily meditation log. GRE test scores (scale of 130-180) from T2 and T3 were compared to those from T1 to assess changes in academic performance. We hypothesize that while both the Fish and Koru Mindfulness courses will enhance academic performance compared to baseline, Kore will show a greater improvement compared to Fish. Results from this self-study will be presented at the Symposium.

History

21. ***They Were Refugees, Not Vacationers: Kindertransports Refugees Housed in British Holiday Camps***
    Presenter(s): Gabby Butler
    Advisor(s): Dr. Jeffrey Koerber

This project examines the British "holiday camps" that served as refugee housing for Jewish children evacuated from Nazi Germany on "Kindertransports." These holiday camps served as a weigh station for refugee children who entered the country with "unguaranteed" status, meaning that a foster home had not yet been secured for them. Holiday camps were just what they sounded like - warm weather vacation destinations for residents of Great Britain. Yet refugee children arrived during the winter months, heightening their already difficult situation. This project examines a series of research questions: Why were refugee children sent to holiday camps? What was their experience like in these first "homes'' as refugees who were separated from their parents? How did these "weigh stations" help or hinder their transition to their future lives? Under what circumstances did they leave these temporary settings? Many refugees who experienced living in holiday camps discuss their memories of these camps in oral histories. One former child refugee was Eva Urbach, who talked about her time living in the Dovercourt holiday located near Harwich in Essex. Urbach spoke about her daily life, the layout of the camp, and how she was able to eventually leave. Despite the winter cold in what was seasonal summer housing, Urbach specifically remembered her time at the holiday camp as an adventure. However, she also recalled how on Saturday and Sunday foster families came to look at children to potentially take into their homes, which to many seemed like a "cattle call" because these foster families only wanted the prettiest and best behaved foster children. In addition to oral histories, historic photographs and scholarly secondary sources support this research.

Pharmacy

22. ***Targeting Different Proteins in Triple-Negative Human Breast Cancer Cell Lines Using CRISPR/Cas9***
    Presenter(s): Dylan Holder
    Advisor(s): Dr. Hamidreza Montazeri

Genetic engineering with Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) and CRISPR-associated protein 9 (Cas9) can potentially be incorporated into clinical applications to target specific proteins in targeted cells, including malignant cells. The capability of CRISPR/Cas9 to permanently silence virtually any protein in transfected cells creates a significant potential for clinical therapies, including cancer treatment. Targeting proteins that have a crucial role in cell growth and survival in human cancer cells can potentially inhibit tumor growth. In this project, we aimed to target two different proteins involved in the proliferation and survival of a human triple-negative breast cancer cell line, MDA-MB-231: MCL-1, an anti-apoptotic protein, and Ribosomal Protein S6 Kinase (RPS6KA5), a kinase that is involved in an intracellular signaling pathway that enhances survival mechanisms. We have previously reported that simultaneous silencing of these two proteins halts the growth of MDA-MB-231 cells in vitro and in vivo. We used a variety of in-house designed nucleic acid carriers to deliver CRISPR/Cas9 ribonucleoproteins (RPNs) targeting Mcl-1 or RPS6KA5 to MDA-MB-231 cells. The total population of cells was used to extract total DNA after transfection, and PCR was performed using multiple in-house designed primers to enlarge the targeted piece of DNA. The samples were then exposed to the T7 endonuclease enzyme to detect the mismatch in the targeted site as an indication of the transfection. Our results show effective transfection of the cells, where the extent of transfection was comparable to the commercially available Lipofectamine CRISPRMAX reagent. In the future, the transfected cells can be identified and separated from the non-transfected cells to create a subpopulation of cells with non-functional Mcl-1 or RPS6KA5. The cell function and reaction to different treatment strategies will be examined in these sub-populations in comparison to the naïve cells.

Physical Therapy

23. ***Parkinson's Disease Patients' Walking Parameters***
    Presenter(s): Mira Ananthanarayanan, Shenhao Jin
    Advisor(s): Dr. Rahul Soangra

Parkinson's Disease (P.D.) severely impacts the basal ganglia region in the brain. Many P.D. patients experience the deterioration of mobility control. The gait of P.D. patients, therefore, deserves a systematic study and evaluation under different walking parameters. The walking parameters include the examination of step length, step time, step width, swing time, and stance time at different points of the gait cycle. This study thoroughly compares these parameters of P.D. patients in a normal-walking setting and dual-task(walking while answering conversational questions). The expected outcome would assist in the identification of risk factors among P.D. patients to prevent injury risk. For the dual-tasking trials, the prediction is that the more distracted the participant is with answering questions, the faster their gait will be. The tests conducted are as follows: normal-walking, stroop, walking-and-stroop, The kinematic and kinetic data were recorded from the participants for data analysis. We hope to recruit 40 to 50 participants for the control group and roughly the same number of Parkinson's patients. The data was collected by infrared markers, force plates, and xsens accelerometers.

24. ***Impact of STROOP Dual-Tasking on Freezing of Gait in Parkinson's Patients***
    Presenter(s): Talia Brennan, Caitlin Ha
    Advisor(s): Dr. Rahul Soangra, Michael Shiraishi

Parkinson's disease is a nervous system disorder that progressively affects one's movement by initiating tremors, stiffness, loss of balance, and slowness in everyday activities. Individuals with Parkinson's often experience freezing of gait (FOG), which is described as the sudden inability to move due to sudden changes in motor actions. During an episode of FOG, an individual will feel stuck and are unable to move their feet forward despite having the intention to walk. This results in the shuffling movement of the feet followed by small steps, which is characteristically seen in Parkinson's patients. In this gait initiation study, our goal was to observe whether or not there was a difference in gait in the initial steps from standing still. Each subject was instructed to stand on a treadmill, begin walking, and stop walking. They performed these actions with both dual-tasking and single-tasking assignments. The dual-tasking assignment involved a STROOP task, which required them to identify the color of a word displayed on the screen while also walking. Reaction forces collected from the force plates embedded in the treadmill, sway, and joint angles of the legs were all measured in order to identify any differences within the first few steps of the subject's gait cycle during both single-task and dual-task environments. We hypothesized that there would be a difference in reaction forces, joint angles, and sway during the initiation of walking for dual-tasking and non-dual tasking for Parkinson's patients.

Political Science

25. ***Who Fears Immigrants?: Decoding the Characteristics of Americans who Fear Immigrant's Impact on the Economy***
    Presenter(s): Kate Riccardelli
    Advisor(s): Dr. Ann Gordon

Understanding which characteristics impact Americans' position and fears towards immigrants will generate a sense of what drives and unleashes fear-driven behavior on immigrant populations. One particular area of public perception towards immigrants that gets a high degree of political debate is immigrants' impact on the economy. This paper will evaluate the relationship between a person's social-economic status, age, and education level towards the perception that immigrants are negatively impacting the American economy. The link between a fear of immigrants and the stated characteristics will be evaluated through the Chapman Survey of American Fears, a representative national survey of American adults. Based on my perception and analysis of statistical correlations, those making over $100,000 a year and belonging to a high socioeconomic status will be less fearful of immigrants' impact on the economy. I predict this to be derived from the high percentage of immigrants belonging to a lower socioeconomic class, which means they do not compete for jobs with those in a higher economic bracket and have less impact on high-income earners' wealth through social welfare taxes. However, the data seems to present a far less significant relationship between income and perception of immigrants, suggesting the public feelings on immigrants' impact is less connected to economic status. I also hypothesize that the data will prove that younger people are far less critical and fearful of immigrants' direct impact on the American economy. The American Survey of Fears has presented this relationship to be statistically substantial. This I predict, is derived from younger generations' acceptance and general tolerance towards minority populations. Linking characteristics to a person's general fear of immigrants and their impact will help

decode people's complex and significant feelings towards immigrants. Historical waves of immigration essentially characterize the United States; thus, understanding and interpreting what drives people's sentiments towards

26. ***Fear and Right Wing Terrorism in America***
    Presenter(s): Ashley Hight
    Advisor(s): Dr. Ann Gordon

Instances of right wing terrorism are terrifying for victims and their families, but what other characteristics make a person more likely to fear it? Who fears right wing terrorism and who does not? What makes these people more or less likely to have a fear of these instances? Is there any correlation between age or race and those who fear right wing extremism as opposed to left wing? By using the Chapman Survey of American Fears, I will analyze data that will help me to form data about what traits people who fear (or do not fear) right wing terrorism tend to have in common. Right wing extremism is on the rise, but is not as prevalent in the media as the COVID-19 pandemic or the Russia-Ukraine conflict, so is it at the forefront of Americans minds? The purpose of this project is to highlight why Americans have a fear of right wing extremism and why people with similar demographics may have a higher perceived fears than those in differing demographic categories. This type of terrorism and extremism has been increasing in recent years, so I will also be analyzing how the fear has increased along with it and whether the demographics have changed as well.

27. ***Why do Americans Report a Greater Fear of Government Restrictions on Firearms than in Years Prior?***
    Presenter(s): Ethan Oppenheim
    Advisor(s): Dr. Ann Gordon

In recent years, studies have shown that support for increased gun control legislation has decreased to its lowest point in nearly a decade and yearly gun sales have approached record numbers. Statistical data found in the Chapman Survey of American Fears suggests that over the past three years, the percentage of Americans who fear government restrictions on firearms has dramatically increased. In this project, I examine this dramatic shift in sentiments and identify the racial, ethnic, and religious demographics which are driving these evolving sentiments on firearm regulations. Upon observing responses given in the most recent survey as well as the previous survey conducted in 2019, I discover a moderately strong correlation between both race and religious affiliation and the observed increase in fear of government restrictions on firearms. According to the data, both Asian Americans and Jewish Americans report a significantly higher fear in government restrictions on firearms in 2021 than in 2019. Further, Black Americans and Hispanic Americans report a moderately higher fear in government restrictions on firearms in 2021 than in 2019. I infer that this relationship can be explained by the recent spike in hate crimes and prevalence of police brutality and civil unrest since the outbreak of the COVID-19 pandemic. While the extent to which support for gun control has declined and gun sales have increased have been studied, the breakdown of demographics driving these changes and the reasons for such are yet to be studied. By delving into this realm, my research findings will explain why certain groups have felt the need in recent years to purchase firearms and why they now express fear of firearm restrictions to a greater extent than in years prior. Reflecting upon these findings may allow us to make greater strides toward making people feel safe in American society.

28. ***Sociodemographic Traits, Death and COVID-19 Vaccine Hesitancy***
    Presenter(s): Ariel Gries
    Advisor(s): Dr. Ann Gordon

Since the start of the COVID-19 pandemic, people have wanted a path to an end to the increasing number of infections and deaths. In December 2020, the first COVID-19 vaccine was released and there seemed to be a glimpse of hope for a future without COVID-19; however, since then, a new hurdle has emerged; the hurdle of vaccine hesitancy. In this paper, I will examine the determining factors that make a person more likely to fear the COVID-19 vaccine, such as religion and religiosity, political affiliation, education, and one's emotions towards death. Using the Chapman University Survey on American Fears, a representative national sample of U.S. adults ages 18 and up during January 2021, I will examine which sociodemographic determinants increase a person's likelihood of fearing the COVID-19 vaccine. Among the interesting findings, it is observed that highly religious respondents were more likely to be vaccine-hesitant. Similarly, it was also observed that respondents with a conservative-leaning political affiliation were also more likely to be vaccine-hesitant, as well as similar results for people with below a high school education. Lastly, it is expected that a decrease in fear and emotions towards death creates more of a likelihood for someone to be hesitant of receiving the COVID-19 vaccine. These findings can help in understanding the steps that can be taken in helping increase immunity through the COVID-19 vaccine and ultimately end the pandemic. Being able to understand which demographics are more likely to be hesitant of the vaccine as well as the correlation between emotions towards death creates an opportunity to use that information in better communicating the benefits of the vaccine in a way that is suitable to people of these demographics.

29. ***What Are You Scared Of? How Social Media News Consumption Impacts Voter Fear***
    Presenter(s): Emilie Haskell
    Advisor(s): Dr. Ann Gordon

In the ideal world, all voters create the perfect democracy by voting through rational choice: logically comparing the available candidates, and selecting the one they perceive to best promote the public good. However, this is not always the case, and the rise of social media news has brought new levels of fear and distrust into the polls. In this piece, I will be examining whether those who reported getting their news from social media are likely to vote for a politician because of their fears. I will be using data collected by the 2020/21 edition of the Chapman Survey of American Fears, a national survey with over 1,000 participants, all of voting age. There is a strong correlation between the two variables, with the interesting addition of a high volume of fear based voting amongst those who consume no social media news whatsoever. However, those who range from getting their news from social media “once or twice a month” to “everyday” fall into a pattern of increased voting based on fear. I will additionally be including data regarding the correlation between fearing corrupt government officials and viewership of social media news, because a significant amount of psychology and media research reveals fear mongering media tactics to be a powerful tool for swaying more moderate voters. As social media use continues to increase, it is incredibly relevant to examine its effect on voters’ increasing fear and distrust of the government.

30. ***Thanatophobia- The Fear of Death***
    Presenter(s): Matt Cotti
    Advisor(s): Dr. Ann Gordon

In this analysis of the Survey of American Fears, the relationship between the fears of death and illness both in oneself and in loved ones, and other independent factors including religiosity, income, employment

status, age, and gender are examined. Empirical research regarding the fear of death, particularly with respect to its origins and implications, has yielded ambiguous data with varied interpretations. Previous research on the fear of death indicates that striations along gender lines exist. Those studies implied that women are disproportionately susceptible to feelings of anxiety and depression, leading to increased levels of thanatophobia- the fear of death (Perez-Mengual, 2021). Similar findings purport that emotions, like grief and anxiety, coordinate with and affect one's fear of death (Gegieckaite, 2022). Other investigations into the relationship between thanatophobia and religiosity have yielded mixed and inconclusive results, not only indicating direct and inverse relationships, but also suggesting no relationship at all (Bassett, 2021). This investigation into the causes and effects of the fear of death attempts to clarify the existing research on the topic, as well as add and amend different underexplored variables to create a more comprehensive understanding of a universally applicable phenomenon.

31. ***Do America's Underlying Christian Morals Correlate with Islamophobic Immigration Policy?***
    Presenter(s): Shea Foresti
    Advisor(s): Dr. Ann Gordon

While America was founded with emphasis on a separation of church and state, its' Chistian roots seep into policy and the perspectives of its citizens. In recent American history there has been an increase of imlamophobia, particularly after the terrorist attack on 9/11. In this paper, I will examine the link between the belief that America's underlying Christian morals are responsible for the success of the nation and support for islamophobic immigration policy. Relying on the Chapman Survey of American Fears, a representative national sample of U.S. adults, I expect to find a strong correlation between those who believe that the success of the United States is part of God's plan and the belief that America should cease all immigration from Muslim countries. This is because the Christian faith has ties with the Protistant religion which believes in a God who punishes sins. With faith in God's plan and America, those who are perceived to encroach on the country's progression may be deemed a threat. I expect to see this correlation due to the historical relationship between these beliefs and and the increase in disrespect for Mulsims and Islam.

Psychology

32. ***How Self-Evaluation of Demographics Modulates the Effects of Attractive Celebrity Images on Self-Image***
    Presenter(s): Leyla Rakshani
    Advisor(s): Dr. Aaron Schurger, Dr. Marina Kahana, Dr. Matthew Ballew

Recent research indicates an effect of attractive celebrity images on mood and body image (Brown, 2016). This effect can further develop into long term issues, such as body dysmorphia or depressive/suicidal symptoms. Female adolescents are especially susceptible to these effects, as they are likelier to engage in intense personal celebrity worship (Maltby, 2005), although this may also be attributed to the lack of research on the impact of media exposure on males' body image (Agliata, 2004). My research will focus on how a self-evaluation of one's own demographics (race, gender, etc.) may modulate the effect of attractive celebrity images on selfimage. I predict that participants will rank themselves as less attractive when asked questions about their demographics before being exposed to images of celebrities versus being asked those questions after (as is usually done in research).

33. Online Dating During the COVID-19 Pandemic: Is it the New Norm?

Presenter(s): Sara Henry, Emily Foster, Alexandra Kraft, Amanda Gesselman
Advisor(s): Dr. Amy Moors

For many who were single during the COVID-19 pandemic, this public health crisis may have led to issues with dating or finding a romantic partner. To understand the impact of the pandemic on dating life, in the present study, we examined single people's dating app usage collected as part of The Kinsey Institute's annual Singles in America project. Using a nationally representative sample of people who were currently single in the U.S. (N = 4,877 with an average age of 45.92), we found that the vast majority of single people (96%) were using dating apps (e.g., Tinder, Bumble, Match) during the COVID-19 pandemic. Sixty-two percent of the sample identified as women and 37.4% identified as men; 88.5% identified as heterosexual and 11.5% identified as a sexual minority (gay, lesbian, or bisexual). One-quarter (24.9%) of single people were using dating apps more frequently than compared to before the pandemic; nearly one-half (42.5%) were less active during the pandemic (the remaining reported no change in dating app usage). Multiple linear regression results show that men and sexual minorities were using dating apps at a higher frequency during the pandemic, compared to women and heterosexual people, respectfully (B = .16, p = .006 and B = .19, p = .01). Age was not associated with dating app usage during the pandemic. Information about video date usage and enjoyment will be discussed as well as common video date activities (e.g., long conversations, sex, games) during the pandemic. Taken together, these results suggest that dating app usage decreased during the pandemic (except for men and sexual minorities), which is likely due to health concerns. At the same time, video dating may have become a new norm during this time period.

34. Prosocial Behaviors Compared: Different College Majors and the Theory of Mind

Presenter(s): Maryanne Cozzetto
Advisor(s): Dr. Desiree Crevecoeur-MacPhail, Dr. Tara Gruenewald

My research over the past two semesters has studied the relationship between college majors and certain aspects of personality for Chapman University undergraduate students. Prosocial behaviors such as empathy levels, self-reported creativity levels, and emotional regulation levels were compared between specifically art majors and non-art majors, expecting to find higher levels of these prosocial behaviors amongst art majors. Additionally, overall satisfaction with college majors was compared between art majors and non-art majors by using a single factor self-report scale. To measure these factors, Chapman students completed a 51-item survey composed of 6 demographic questions, 1 major satisfaction question, the fantasy and perspective-taking scale subsection of the second version Empathy Questionnaire (Davis et al., 1980), the emotional regulation questionnaire (Gross, 2003), and the 20-item Kaufman Domains of Creativity Scale (20-K-DOCS) (Tan et al., 2021). Participants consisted of Chapman undergraduate students who were thanked for their participation and remained completely anonymous. The expected results of this study are that art majors will report higher levels of empathy, emotional regulation, creativity, and overall satisfaction towards their major in comparison to non-art majors. Implications of this research include a wider acceptance of art-based majors in comparison to more traditional majors, showing art majors report higher levels of empathy, emotional regulation, creativity, and overall satisfaction towards their major in comparison to non-art majors.

35. ***Parental Leave Length and Feelings Towards Leave Predict Postpartum Mental Health***
    Presenter(s): Christine Chang
    Advisor(s): Dr. Laura Glynn, Sabrina Liu

Previous research has identified the postpartum period as a sensitive period for women's mental health due to the changes in both biology and life circumstances. For a subset of women, those that are working, this can be an especially vulnerable time as they must contend with the challenges of balancing their work and family life with the addition of a child. It is widely assumed that parental leave benefits maternal wellbeing postpartum, however, little is known about the specific characteristics of parental leave that influence maternal mental health. Therefore, the present study investigated the extent to which working women's leave length and feelings towards their leave was linked to mental health at six and twelve months postpartum. Participants included [N = 93] women who had worked during their pregnancy and recently gave birth. Mothers completed questionnaires about their leave length, whether their leave was paid or unpaid, whether they missed their previous activities at work, and whether they felt confined or trapped at home. Maternal depressive symptoms were measured at 6- and 12- months postpartum using the Edinburgh Postnatal Depression Scale (EPDS). Results revealed a significant association between feeling confined at home while on leave and depressive symptoms at 12-months postpartum. Feeling confined at home did not moderate the relation between leave length and maternal depressive symptoms at 6- and 12- months postpartum, but missing work significantly moderated the relation between leave length and maternal depressive symptoms at six months postpartum. For women who missed their previous activities at work, longer leaves were associated with increased depressive symptoms at six months postpartum. This study is one of the first to address how a women's feelings toward work could impact her mental health while on parental leave and emphasizes the need for additional research on the experiences of working women postpartum.

36. ***Effects of the COVID-19 Pandemic on College Student Stress and Anxiety***
    Presenter(s): Derek Stein
    Advisor(s): Dr. Tara Gruenewald, Dr. Desiree Crevecoeur-MacPhail

The COVID-19 pandemic has drastically changed the lives of hundreds of millions of people globally. We as a society have been forced to adapt to our new environment, and for many people feelings of stress and anxiety have come alongside these changes. This study seeks to add to the existing pool of literature regarding the COVID-19 pandemic's impacts on mental health and well-being. This experiment specifically looks into the mental health implications of the pandemic on college students, an underrepresented group in existing literature surrounding the COVID-19 pandemic. This study investigates whether college students report experiencing more symptoms of anxiety and stress during the pandemic in comparison to individuals within other age groups. Additionally, this study looks into how loneliness is correlated with anxiety in individuals that completed the initial study administered at the height of the pandemic. Lastly, this study investigates possible effective methods of stress reduction in the form of exposure to animals or pet ownership. All of the data generated from the second administration of this study were compared to the data generated from an administration that occurred in April of 2020, during the height of the pandemic. Both administrations of this study utilized Cohen's 5 Item Perceived Stress Scale (PSS-5), Spitzer's 7-Item Generalized Anxiety Disorder scale (GAD-7), and the 4-Item UCLA Loneliness Scale. Results are expected to indicate that mental health components such as anxiety and stress have worsened within the pandemic. Additionally, the results are expected to show that individuals that were college students during the

pandemic had higher levels of stress and anxiety than individuals within other age groups. Finally, assuming these negative implications of the pandemic are verified, effective coping mechanisms and strategies must be identified so all who have been negatively impacted by the COVID-19 pandemic can be effectively helped and healed.

Religious Studies

37. Mesopotamian Goddess, Ereshkigal

Presenter(s): Natalia Olmos

Advisor(s): Dr. Julye Bidmead

There are many different interpretations of what we perceive as the afterlife. Some cultures, such as the Greeks, referred to it as the underworld, which was ruled by the god Hades. However, in Mesipataian culture, it is referred to as the netherworld. A realm, which is ruled by Ereshkigal, goddess of the underworld. The goddess Ereshkigal is looked up to because she holds such an important and dominating role among the Mesopotamia gods and goddesses. She is a female representing a role that is mostly given to male gods, an example being the Greek god Hades. While taking a closer look at Ereshkigal, it is important to see that while she does hold such an important and meaningful status, why is it that a goddess is to be chosen to be responsible for thighs such as death, disease, and famine? This allows us to explore not only Ereshkigal as a goddess but the gender roles in ancient Mesopotamia, along with looking for gender stereotypes when this goddess is being discussed or represented in the literature.

38. The Zodiac: Should Science Erase Tradition?

Presenter(s): Stuart Ledbetter

Advisor(s): Dr. Julye Bidmead

Astrology, along with those who believe in its divination properties, have been ridiculed by academia for almost a hundred years. This is despite astrology, and in fact many other types of divination have been believed and accepted as legitimate scientific practices for much longer. Therefore, I intend to research why people believed in astrology and the zodiac signs in the beginning, and how that belief has persisted and changed across cultures for thousands of years. Clearly, something that has existed for that long of a time is bound to change somehow. Nowadays astrology, divination, and the zodiac have been firmly classified as pseudo-science, a classification I agree with. Nonetheless, examining how beliefs started and have changed provides invaluable insight into what different cultures believed, valued, and rejected throughout history. Although this perception on astrology has only emerged recently, one must ask why it changed in the first place. There are a plethora of sources detailing the beginning of and use for astrology and the zodiac, and there are also plenty of people, books, websites and more detailing how people interpret it today. My prediction is that once astronomy began to flourish with the creation of better telescopes that were able to differentiate between star, planet, moon, asteroid, galaxy, and every other celestial body, the mystery and mysticism of the sky declined into a more rational, categorized field of research, and belief of magic declined as such.

39. Women And Death In Mesopotamia

Presenter(s): Moira Wu

Advisor(s): Dr. Julye Bidmead

The ghost or spirit is one of the most prevalent figures in societies spanning from eastern Asia to ancient Greece, medieval Europe, and of course, Mesopotamia. Mesopotamian ghost culture stems from the tale of Belet-ili, who mixes his flesh and blood with clay so that god and man are mixed, and the spirit is produced from the god's flesh. In this way, the eṭemmu revealed godliness in a human being, the spirit. The culture around ghosts and the afterlife was so present in Mesopotamian society that the spirit world could be considered as integral as the living world to Mesopotamians; after all, ghosts were quite literally all around you with your family's bodies buried in your house's walls and floors. Much like ghosts, which were cemented into daily life in Mesopotamia, gender roles also held rigid structures in Mesopotamian society, especially in relation to death and the spirit world. Women played an integral part in the culture relating to death, both as professional mourners and as those that prepared the bodies for burial by washing and anointing the corpse. In the spirit world, too, one woman in particular played an important role. Ereshkigal ruled the realm of the dead and was considered one of the more powerful goddesses for it. My research will take both the living and the spirit world into account and explore the parallels between ghosts and the spirit world to Mesopotamia's gender role structure, emphasizing the connection between women and death.

40. Ancient Mesopotamian Omens & Modern Day Superstitions

Presenter(s): Morgan Tapia

Advisor(s): Dr. Julye Bidmead

If you spill salt, you will have bad luck unless you throw the salt over your left shoulder. If you wear a rabbit's foot, it will bring you good luck. If you open an umbrella inside, you will get struck by lightning. Most call these superstitions, but in the Mesopotamian era, they would be classified as omens. Omens were the most common source of divination, and unlike modern day superstitions, Mesopotamian omens were seen as factual scientific works. Omens were an indication that the gods were displeased, so the Mesopotamian's tried to decode their messages. One way of doing this was the practice of extispicy. Extispicy was the act of sacrificing an animal (usually sheep), asking the gods to place certain signs on the left or right side of the liver, then deducting an answer from what the gods did; that answer was then written on a cuneiform tablet and delivered to the querent. Extispicy was one of four provoked methods. The other three methods were lecanomancy, libanomancy, and aleuromancy. There were unprovoked methods as well which included: abnormal birth omens, private omens, and astrology. Whether the omen was provoked or unprovoked, they all had the same format: "If this happens, then that happens." In Mesopotamian times, omens were seen as something of concrete proof. In modern times, most people do not believe in superstitions and often find them foolish. Many of the ancient Mesopotamia omens and practices still have some connection to our modern day superstitions, but their importance faded away as time went on. How did omens not only evolve into superstitions, but why did their importance diminish as well? For example, ancient Mesopotamian texts of omens were the beginnings of our modern superstitions. My research examines the development of these omens.

41. ***Mesopotamian Omens and Astrology***
    Presenter(s): Joseph Wall
    Advisor(s): Dr. Julye Bidmead

Omens were a part of daily life in ancient Mesopotamia. People could interpret Omens in various ways, from death to the weather. Omens also came up in a variety of ways. Sometimes it was something as simple as an eclipse telling of a bad event. Other times, the people would seek answers, kill a sheep, and "read" its entrails. By definition, Omens are the gods indicating future events to the people. The Mesopotamians took Omens very seriously. An omen could predict life or death. Specifically, certain astrological occurrences could indicate future events. This also leads into mesopotamian astrology. Astrology was another way ancient Mesopotamians could predict future events. Omens and astrology are very similar. Along with this, the moon was a big piece in omens. Eclipses were almost always a huge sign of something bad happening in the future. Omens and astrology are closely link but have in common one thing: They predict some sort of outcome for the future. Omens and astrology have also carried themselves into our everyday lifes. We still have omens, for example if a black cat crosses your path its bad luck. We have western astrology, which has many similers to ancient mesopotamian astrology. These two future predicting tools were very present in the mesopotamian society, and they still have a presence now.

42. ***Mesopotamian Depiction vs Modern Day***
    Presenter(s): Luca D'Emilio
    Advisor(s): Dr. Julye Bidmead

The depiction of ancient Mesopotamian gods has changed so much over time. There are such vivid sketches that were preserved that give us a clear image of what these gods supposedly looked like, yet our generation as well as previous ones have taken it upon themselves to change the image of these gods when it is not their place to. By comparing the ancient versions of what these entities looked like according to the ancient Mesopotamians with their modern representation, this presentation will be able to show the differences between our cultures and the culture of ancient Mesopotamia. I am hopeful to learn why Mesopotamians decided to depict the gods the way they did and where these images originally came from. For example. The depiction of the demoness Lamashtu, who was responsible for death and danger to pregnant women and infants, varies greatly from her original Mesopotamian appearance to how moderns portray her. Ancient carvings and drawings of her represent a figure with an animal head holding two snakes, while a modern-day depiction is a wild animated and almost sexualized version of a being that has almost no resemblance to the Mesopotamian version at all.

43. ***Mesopotamian Rituals: The Afterlife and Witchcraft***
    Presenter(s): Raneem Rahman
    Advisor(s): Dr. Julye Bidmead

I'm sure that we have all kept up to date with images of the paranormal and witchcraft shown in popular culture and that we all have a specific picture of what these elements look like to us. It is known that early Mesopotamia did engage with witchcraft and the afterlife, but not how we see it portrayed today. Mesopotamian life has followed one specific theme, rituals. Early theories of magic were seen in the early nineteenth-century rise of scientific interest in magic, and it's based upon the association of ideas. Many people were trying to differentiate magic and religion because they both involve ritual and symbolism, deal with forces beyond science, and rely on a worldview in which other events cause events. Magic applies

images and symbols and responds to a human need to control destiny and their own life - it provides knowledge and control. Magic involved the supernatural, which also ties into ghosts, fixed time, specific rituals, and taboos to be observed. Everyday Mesopotamian life was genuinely affected by the issue of pesky ghosts and the task of performing rituals to aid their society. Like many others, I believe in the paranormal and omens. My goal is to bring to light the extent of ritual use and why and how essential these elements of life were to the growth of Mesopotamia. My research explores the difference between religion and witchcraft during this time, the relation between magic and the paranormal/afterlife, and how rituals were used in almost every sense of life.

44. A Bull (of Heaven) in a China Shop

Presenter(s): Faith Ho Russell

Advisor(s): Dr. Julye Bidmead

The Bull of Heaven, also known as Gugalanna, is a Mesopotamian mythological creature that caused a great deal of chaos in both the earthly and godly worlds. He was sent by Goddess Inanna to attack the city of Uruk and defeat its leader Gilgamesh. However, upon arrival, Gugalanna is confronted by both Gilgamesh and his legend-of-war friend Enkidu, which ultimately leads to the Bull's demise. His death combined with the threat to kill Inanna in the same dismembering manner enrages her and other gods to seek vengeance. Gugalanna is commemorated by the Taurus constellation. This story is important to tell and delve deeper because the cascading events as well as the bull's great involvement in Mesopotamian history as a whole demonstrates the complex connections and plotlines in ancient Near East mythology. In addition, his symbolism appearing frequently in astrology today sheds light on the true relevance of an unsung culture, and reveals historical significance that tends to get lost during modernization. I intend to create a work that comprises visuals of the beast from his original to contemporary form, as well as verbal descriptions of crucial events he partook in.

45. The Story of Creation: The Reason for Creation

Presenter(s): James Serpa III

Advisor(s): Dr. Julye Bidmead

First of its kind and believed by many from its time is the Ancient Mesopotamian creation, Enuma Elish. Enuma Elish details how the world was created by Marduk, the god, after defeating Tiamat and how humans came to be. Historians have studied creation myths not because it was a popular story back in the day but because they revealed what that culture believed in, what they valued, and how they fit into the bigger picture. The natural question of "why?" arises when it comes to these creation stories: why did they believe this or that, why did this happen, but the biggest "why" is, why were these myths created in the first place? Some believe creation myths were created to explain the world and how it came to be, after all, people nowadays are still asking that same question. My thesis, however, is that the purpose of these myths is to explain the role humans play on this earth and how the world was created is merely just a piece of the explanation. Looking at details included in Enuma Elish along with research on the context of when and where this story was created will reveal this myth (and just like other creation myths) was created to explain the purpose of humanity's existence and reveal what exactly is the purpose of humanity according to the Ancient Mesopotamians.

World Languages and Cultures

46. ***La République Démocratique du Congo: Aide humanitaire dans un pays grandement divisé (English: The Democratic Republic of Congo: Humanitarian aide in a greatly divided country)***
    Presenter(s): Harrison Gross
    Advisor(s): Dr. John Boitano

This work aims to analyze systemic problems with humanitarian aid programs in the Democratic Republic of the Congo and to propose a new approach based upon relevant secondary research as well as a general examination of recent political history of the region and intertwined alliances of armed groups in the area. This analysis of the modern Congolese problem consists of three parts; First, the examination of recent geopolitical history in the region (1990-present), and the current humanitarian situation in the DR Congo in order to understand the complex set of relationships between actors in the region, and to specifically define the humanitarian needs in the DR Congo. Second, an analysis of the humanitarian programs currently in operation in the Congo and the theory of modern international humanitarian intervention, to understand the flaws and difficulties with current aid programs. Third, an examination of proposed solutions and improvements to current aid structures in the context of the problem within DR Congo.

AF 209A

Communication Studies

4:00pm-4:20pm
Chatbot Tetanus Shot
Presenter(s): Malak Abulohoum, Audrey Shin, Nicole Yoo
Advisor(s): Dr. Austin Lee
With the decrease in HPV rates among men and women since vaccinations were introduced, the growth rate of vaccination is long-delayed in the US. Creating the chatbot helps encourage and persuade people through a user-friendly conversational agent with a computer program designed to simulate an intelligent conversation about the HPV vaccine. To answer the most common question and provide resources to receive the vaccine, the chatbot will use reliable sources such as the CDC as a reference. Its target audiences are teenagers and young adults under a the viable age to get vaccinated.

Health Sciences and Kinesiology

4:20pm-4:40pm
A community-based approach to advance access to healthy food in South Los Angeles
Presenter(s): Leilani Brown
Advisor(s): Dr. Jason Douglas
Low-income communities of color in South Los Angeles (SLA), California, bear a disproportionate burden of fast-food restaurant density compared to neighborhoods in wealthier areas such as West Los Angeles.1 This raises concerns for SLA residents, as food deserts have been found to contribute to racial and ethnic health disparities. Further, in 2018, the obesity rate among Black LA County residents was 32.5% compared to 21.9% among White residents.2 Obesity increases the likelihood of other health problems such as diabetes and hypertension. Thus, grass-roots actions to redress inequitable access to healthy food must be taken to advance health and well-being in underserved communities like SLA. To support these efforts, the current project proposes to utilize a participatory mapping approach with 40 SLA-based youth and adult residents to investigate two central research questions. (1) What healthy food options are currently available to South Los Angeles residents? (2) What social and environmental factors affect access to healthy food in South Los Angeles? The work will take place in the Westmont/West Athens community of South Los Angeles. Using large, table size maps of the surrounding community, residents will participate in 1) identifying social (e.g., crime, violence) and environmental (e.g., unequal access to transportation) factors associated with access to healthy food; 2) locating commonly visited food retailers; and 3) identifying grass-roots and policy approaches for improving access to fresh and health food. The results of this study have the potential to inform community- and policy-based approaches for improving access to healthy food in underserved communities. Resources: [1] “Food Environment Atlas.” USDA ERS - Food Environment Atlas, www.ers.usda.gov/data-products/food-environment-atlas/. [2] Rhone, Alana, et al. “Understanding Low-Income and Low Access Census Tracts Across the Nation: Subnational and Subpopulation Estimates of Access to Healthy Food.” United States Department of Agriculture, May 2019, https://www.ers.usda.gov/webdocs/publications/93141/eib-209.pdf?v=5719.8

Psychology

4:40pm-5:00pm

Sexual Education History and Sexual Attitudes

Presenter(s): Riley Murphy

Advisor(s): Dr. Desiree Crevecoeur-MacPhail, Dr. Tara Gruenewald

The present study evaluated the impact of sex education and sexual identity on various outcomes, such as sexual satisfaction, sexual esteem, and sexual communication with partners. Sex education has been a widely debated topic with limited understanding of the impact of sex education on sexual behaviors later in life. Previous research had not evaluated the link of comprehensive sex education and sexual self-esteem nor sexual communication. Studies have found that school-based and comprehensive sex education results in higher sexual satisfaction and the present study aimed to further solidify this claim (Evans, Widman, & Goldey, 2020; Farnaz et al., 2008). LGBTQ identity status and sexual esteem was also evaluated, and it has been previously found that LGBTQ identity status and facets of self-esteem to be negatively correlated (Yean et al., 2013). Participants were asked various questions including demographic questions, questions evaluating comprehensiveness and source of sex education, the Sexual Esteem measure, Dyadic Sexual Communication Scale, and the Sexual Satisfaction Questionnaire. Results indicated interesting relationships between sexual education history and facets of sexuality and the results of the study were used to contribute research towards the sex education debate and inform further sexual health related curriculum. Evans, R., Widman, L., & Goldey, K. (2020). The role of adolescent sex education in sexual satisfaction among LGB+ and heterosexual young adults. American Journal of Sexuality Education, 15(3), 310-335. Farnaz F., Pakgohar, M., Mirmohamadali, M., Mahmoodi, M. (2008). Effect of sexual education on sexual health in Iran. Sex Education 8(2), 159-168. Yean C., Benau E.M., Dakanalis A., Hormes J.M., Perone J., Timko C.A. (2013). The relationship of sex and sexual orientation to self-esteem, body shape satisfaction, and eating disorder symptomatology. Front Psychol. 4, 887.

AF 209C

Philosophy

4:00pm-4:20pm
A Free Relationship to Technology
Presenter(s): Haley Lilla
Advisor(s): Dr. Robert Allison
What is the difference between pre-modern technology and modern technology? The windmill, one of man's oldest machines, and the modern wind turbine generate power in different ways: one catches and transforms energy while the other extracts and stocks energy into standing-reserve, something waiting for technical application. One works in accordance with nature, while the other withdraws, stores, and wills nature into supply. The danger of humanity's tendency to use technology to position things into standing-reserve, a mere resource waiting for production, is the possibility that humanity will gradually view itself as standing-reserve. People will be seen merely as inventory in a factory that can be managed and disposed of in the same way raw materials currently are. In 1954, Martin Heidegger wrote "The Question Concerning Technology," a philosophical work that asks how humans can prepare themselves for a free relationship with technology. Arguing that the essence of technology is not technological, breaking away from its common conception as merely an instrument, Heidegger seeks out the true essence of technology. Drawing from Aristotle's theory of causation, Heidegger attempts to bring man into a proper relationship with technology: one that doesn't rebel nor condemn technology as the enemy. In this project, I aim to first account for Heidegger's understanding of the essence of technology. Then, I will explore what a free relationship to technology means and how one might practically prepare oneself for it.

Political Science

4:20pm-4:40pm
Wealth v. Partisanship: Measuring Perceptions of the Future and Happiness in Orange County
Presenter(s): Hawk Ohannessian
Advisor(s): Dr. John Compton
What factors drive the decline of the perceptions of the future and happiness in Orange County (OC)? Are negative views of the future better explained by economic factors or by fear or dislike of the opposing party in power? Existing literature offers a few theories that attempt to explain the level of happiness and thus the perception of the future, such as comparison theory, cultural theory, livability theory, and lastly, Veblen's theory of conspicuous consumption. This paper argues that cultural theory and livability theory explain the negative views of the future. The issues OC is facing, such as housing shortage and high cost of living, can be argued under the livability theory. Cultural theory references the changing demographics both in the party makeup and growing diversity in the county. Using public data from the 2021 Orange Country Annual Survey (OCAS), I will evaluate the influence of economic variables such as income and demographic variables such as party identification or cultural identification on perceptions of the future and happiness. The findings show that livability theory and cultural theory best explain the current situation of OC and that the issue is both economic and cultural. Additionally, the county can best improve

whether that may be in more investment in general infrastructure and economic growth, affordable housing, "civic infrastructure," or community-centered programs to create a more connected community amongst a diverse atmosphere."

Sociology

4:40pm-5:00pm

Dress Coding Latinidad: Color-Blind Sexism in School Dress Code Policies

Presenter(s): Marisa Quezada

Advisor(s): Dr. Lynn Horton

Whether dressing for the private or public, clothing is an essential aspect of the human experience. Dress code policies have been a point of contestation for many students for centuries, dating back to Native American boarding schools limiting certain types of clothing or the landmark Tinker v Des Moines case of 1969. Even through the courts at the time argued that students do not "shed their constitutional rights to freedom of speech or expression at the schoolhouse gate" in regards to their political expression, dress codes continue to persist in American schools (ACLU). However, students of color, particularly girls of color, have differing experiences from White students in terms of who is being reprimanded for a dress code infraction (NWLC, 2018). Researchers have studied the relationships of Black girls with dress code policies, but less research has investigated the experiences of Latina/e/x identifying girls and how their race and gender intersect to create their specific lived experiences. Through expanding on research conducted on the experiences of Black girls and incorporating theories of color-blind racism, intersectionality and working class femininity, this research examines the experiences of high school aged Latinas with dress code policies. Through semi-structured interviews with six participants who recently graduated high school, themes of color-blind sexism, curvy bodies as hypersexual, and the limitation self and cultural expression emerged. For high school aged Latine girls, the dress code is yet another way for color-blind sexism to manifest itself in their lives and the institutions they belong to. By viewing the young Latinas' experiences through color-blind and intersectional lenses, we can better understand the experiences of Latina girls with dress code policies, how it impacts their lives, and how their identities were formed around and in conjunction with these experiences.

AF 209A

Psychology

8:30am-8:50am

Childhood Illness Experiences and Well-Being in Adulthood

Presenter(s): Claire Mikami

Advisor(s): Dr. Desiree Crevecoeur-MacPhail, Dr. Tara Gruenewald

Chronic illnesses afflict 1 out of 4 children in the United States, according to the National Center for Chronic Disease Prevention and Health Promotion (2020), that will impact their families and personal lives for years after childhood. Prior research has found that there is a positive correlation between the presence of a chronic illness during childhood and the child's level of anxiety symptomatology, level of resilience, participation in risky behaviors, and a negative correlation with one's self-efficacy during childhood. Chronic illnesses are becoming increasingly prevalent during childhood; however, there is a gap within the field of research that addresses the long-term impacts of having a chronic illness during childhood on one's social development in adulthood. Using Erik Erikson's eight stages of psychosocial development as a supporting foundation, this study focused on individuals who had a chronic illness during childhood and examined how it impacted the individual's mental health, resilience, self-efficacy, and participation in risky behaviors later in adulthood. This study compared Chapman University undergraduate students who indicated that they were diagnosed with a chronic illness during childhood to those who indicated that they were not diagnosed with a chronic illness and analyzed the mean scores from four scales to determine if any correlations existed. It is expected that individuals diagnosed with a chronic illness during childhood would have lower levels of self-efficacy and higher levels of anxiety symptomatology, resilience, and participation in risky behaviors compared to individuals who did not have a chronic illness diagnosis during childhood. If the data gathered is found to be statistically significant, it could help inform and guide future policies, practices, and treatments for children with chronic illnesses to ensure those individuals are less likely to develop correlated anxiety symptomology, reduce participation in risky behaviors, and increase resilience and self-efficacy later in adulthood.

8:50am-9:10am

How the Big Five Personality Traits and Empathy Associate to Political Behaviors

Presenter(s): Gia Roberts

Advisor(s): Dr. Desiree Crevecoeur-MacPhail, Dr. Tara Gruenewald

From the start of the COVID-19 pandemic, the political atmosphere in the United States increasingly became more divided and volatile due to differing political beliefs. Personality is connected to many different attitudes and outcomes in our everyday lives, as well as political behaviors. The purpose of this study is to determine how individual differences such as empathy, and the Big Five Traits of personality are related to political behaviors. The Big Five Theory states that all personalities can be simplified down to five core factors: openness to experience, conscientiousness, extroversion, agreeableness, and neuroticism, also known as O.C.E.A.N. (Ehrler et al., 1999). Additionally, the specific political behaviors that were evaluated included voting participation, an individual’s political ideology, political trust in one’s government, and an individual’s level of political activity (if they were aware of elections they were eligible to vote in, if they were registered to vote, and if they actively vote). The predictor variables included the

Big Five traits and empathy, and the outcome variable was the political behaviors. The current study used a survey, and a positive correlation is expected between people that are high in agreeableness and liberalism, and those who are high in conscientiousness and conservatism. Additionally, a positive correlation is expected between those who are high in openness to experience and those who are more likely to vote in elections, and a positive correlation between those who are high in openness experience and conscientiousness and political trust. Lastly, a positive correlation is expected between those who rate low in empathy and low political activity. In the future, this research may be important to better understand how personality is important in decreasing the political polarization in the world. Also, this research may aid political campaigns to better understand how to attract and engage more voters.

9:10am-9:30am

Intimacy Comfortability and Love Languages in Bisexual Individuals

Presenter(s): Alexis Singleton

Advisor(s): Dr. Desiree Crevecoeur-MacPhail, Dr. Tara Gruenewald

This study examined various relationship factors of individuals attracted to more than one gender. Previous studies in the realm of sexuality focused primarily on heterosexual experiences with less on same sex relationships. However, there has been very little research on sexual identities outside of the binary. Individuals with LGBTQ+ identities are more likely to experience minority stress and face a particular difficulty navigating romantic relationships in a heteronormative society (Guschlbauer et al. 2019). This study involved a survey with questions on participants' intimacy-comfortability, dominant love language, home life growing up, sexual-identity security, relationship satisfaction and their parents' predominant love language style. It included questions from the Fear-of-Intimacy Scale (Descutner & Thelen, 1991), Measure of Sexual Identity Exploration and Commitment (MOSIEC) (Worthington et al. 2008), Five Love Languages Scale (Egbert & Polk, 2006) and Relationship Satisfaction Scale (RAS) (Henrick 1998).The results of this study are expected to indicate that there is a correlation between sexual identity security, if a participants grew up in a single parent household, relationship satisfaction and intimacy comfortability and a correlation between a participant's gender specific love language and that of their parents. The results of this study could be used to inform counseling programs, crisis intervention, education curriculums and therapeutic techniques to reduce identity stress and confusion in bisexual individuals and improve their overall quality of life.

AF 209B

Psychology

8:30am-8:50am
No Planet B: Perceptions of Climate Change
Presenter(s): Catherine LaCascia
Advisor(s): Dr. Desiree Crevecoeur-MacPhail, Dr. Tara Gruenewald
Climate change is a growing problem in the United States. Likewise, concerns surrounding the effect of climate change on one's mental health is especially of concern amongst experts and the public. Thus, this study explored the effects of climate change on depression and anxiety, as well as the effects of climate change on the mental health of folks of different racial and socioeconomic backgrounds. An online, anonymous survey was administered to various participants of various genders and racial backgrounds via the SONA participant portal at Chapman University. Results are expected to indicate that individuals who report higher levels of climate change anxiety will likewise report a higher level of depressive symptoms, individuals who report higher levels of perceived climate change anxiety will report higher levels of anxiety, BIPOC individuals will report higher levels of perceived climate change anxiety in comparison to their white counterparts, and individuals of higher socioeconomic status will report lower levels of climate change anxiety. If statistically significant, these results will indicate a correlation between climate change anxiety and depression, anxiety, and will likewise have a grander implication in its effects on BIPOC individuals and folks of different socioeconomic statuses. Moreover, if statistically significant, these results will suggest that climate change has a differential and cognitive impact on different groups. Thus, this would indicate the need for greater education surrounding climate change and support for these disproportionately affected groups.

8:50am-9:10am
Childhood Bullying Experiences
Presenter(s): Liliana Day
Advisor(s): Dr. Desiree Crevecoeur-MacPhail, Dr. Tara Gruenewald
Bullying is prevalent in schools and understanding the long-term impact of bullying can motivate people to implement early prevention of this type of childhood trauma. According to the CDC, about 1 in every 5 high school students reported an incident of bullying (2019). There is a large number of studies that examine the detrimental effects that bullying can have on childhood mental health. There are far fewer studies that examine the potential connection between childhood bullying experiences and adult mental health. This study aims to explore possible connections between childhood bullying experiences and increased substance use, anxiety, and depression symptoms in adulthood. Additionally, this study aims to understand if there is a connection between childhood bullying and the formation of anxious attachment in adult relationships. Undergraduate students from Chapman University were selected from the undergraduate psychology participant pool to participate in this study. The participants completed an online survey and the results from each different section of questions will be compared to identify possible correlations. The results are expected to show a positive correlation between adverse childhood bullying experiences and increased substance use, anxiety symptoms, and depressive symptoms. Furthermore, the results of the study are expected to show a positive correlation between childhood

bullying experiences and the onset of anxious attachment in adult relationships. By understanding the connection between childhood bullying and adult mental health issues, society can begin to address severe problems caused by adult depression, substance abuse, and relationship difficulties. Society can focus resources on a root cause--bullying--at an early age to reverse recent trends and improve the lives of millions of adults.

9:10am-9:30am

Alcohol as a Social Lubricant: The Motivation for Drinking Alcohol

Presenter(s): Daniel Mejia
Advisor(s): Dr. Tara Gruenewald, Dr. Desiree Crevecoeur-MacPhail

The reasoning for adolescent social drinking has not been clearly defined, yet the reduction of social anxiety and promotion of sociality are believed to be key factors to this behavior. The Alcohol Myopia Theory describes the adverse effect alcohol has on cognition, most specifically regarding attention and processing (Steele & Josephs, 1990; Monahan & Lannutti, 2000; Carey et al., 2018; Fillmore, Carscadden, & Vogel-Sprott, 1998). As alcohol inhibits attention, only stronger or more provocative cues are paid attention to, and previously inhibited thoughts or behaviors become present. Relating this to the Cognitive Bandwidth model, the two models bolster each other as they describe the same occurrence: the reduction of cognitive functioning allows for less being paid attention to and therefore previously inhibited thoughts or behaviors become present under the influence of alcohol (Mulainathan & Shafir, 2013). The aim of this study was to identify key motivators of drinking behaviors in college students. Students enrolled in college above the age of 21 completed the initial survey either through Chapman SONA or through a link on social media. The survey asked the participants demographic questions, a question about their drinking habits, and the Comprehensive Effects of Alcohol (CEOA) survey (Fromme, Stroot, & Kaplan, 1993). If the participant indicated that they drink at least once a week they completed a second survey of the CEOA after they had consumed two drinks. The beliefs and scores before and after the drinking behavior were compared and this data was compared to participants who do not drink at least once a week. It is expected that students will be more confident, more social, less stressed, and more cognitively impaired under the influence of alcohol than sober.

AF 209C

Electrical Engineering

8:30am-8:50am
Implementing Genetic Algorithm for Optical Metasurface Design
Presenter(s): Tyler Woo
Advisor(s): Dr. Nasim Estakhri
In this project we use computational optimization techniques to design photonic metasurfaces for arbitrary wave bending (i.e., changing the direction of the propagation of the wave). A photonic metasurface is an extremely thin structure composed of various materials ranging from metals (such as gold and silver) to dielectrics (such as silicon and silicon dioxide) at the length scale of nanometers (one billionth of a meter). The primary advantage of metasurfaces compared to traditional optical elements (such as prisms) is the extremely compact profile which allows for easier integration and lower loss. Simultaneously, metasurfaces provide a rich design platform where the output can be controlled by different physical parameters such as the length, width, height, and material properties of the surface elements. Here we report multiple dielectric and plasmonic metasurface designs, where the surface successfully modifies the direction of the incident wave from 0 degrees all the way to near grazing angles (i.e., 90 degrees). All our designs demonstrate more than 90% efficiency, verified by full wave simulations in COMSOL software. We use Genetic Algorithm Optimization to estimate the best parameters for each metasurface. Genetic Algorithm is inspired by natural selection to generate the most suitable "offspring" at each step, and thus moving toward the global optimum for the solution. In addition, we report metasurface beam splitters where the incident beam is divided between two oblique waves. The reported metasurfaces are part of an ultrathin interferometer design which will be briefly discussed.

Psychology

8:50am-9:10am
Examining the Long-Term Effects of Parental Divorce on Children's Interpersonal Relationships
Presenter(s): Amanda Cruz
Advisor(s): Dr. Desiree Crevecoeur-MacPhail, Dr. Tara Gruenewald
In the United States, almost 50% of marriages end in divorce, putting many children at risk of witnessing their parents' separation (CDC, 2019). Enduring an adverse childhood experience, such as parental divorce, can be detrimental to children's development. Thus, the purpose of this research study was to examine the long-lasting effects of parental divorce on children, specifically regarding their interpersonal relationships in adulthood. Based on previous research establishing a positive correlation between experiencing parental divorce and insecure attachment styles, the current study argued that parental divorce will have harmful effects on interpersonal outcomes in adulthood. Specifically, experiencing parental divorce in childhood (i.e., 1-17 years old) will result in lower levels of emotional support and social networking, and higher levels of loneliness and negative communication skills in mature adulthood (i.e., 25 years and older). By examining a population of individuals 25 years and older, this research contributed a greater understanding of how childhood events affect adulthood functioning. Additionally, this research highlighted the need for updated intervention plans to assist children throughout their lifespan in order to overcome potentially harmful and long-term psychological and social outcomes associated with parental divorce.

Dance

9:00am-9:15am
Dwell In Technicolor - Works In Progress Concert 2022
Presenter(s): Kevin Ivins
Advisor(s): Robin Kish, Wilson Mendieta
My piece "Dwell In Technicolor" follows the journey of a young man coming out as gay, but learns to accept himself for who he truly is. The dancer utilizes a marker to symbolize his new journey of becoming his most honest and true self by adding a new sense of color in his life. The dancer in this piece is Zachary Buri, and the music utilized was "On The Surface," composed by Michael Martin of Hummingway Music.

9:15am-9:30am
Orpheus and Eurydice
Presenter(s): Ashton Titus
Advisor(s): Liz Curtis
Orpheus and Eurydice, performed by Sarah Hurley and Raina Manzanares, depicts the Greek myth of Orpheus, who is allowed to take his deceased lover, Eurydice, back to the land of the living, but only if he can do so without turning around to see if she's following him. I explored themes of trust and a lack of it, as well as the inherent choreographic limitations that the story presents. I had the pleasure of not only choreographing this piece, but collaborating with my father, Dale Titus, on the composition of the original music.

9:30am-9:45am
Around the Clock
Presenter(s): Leeor Oshri
Advisor(s): Robin Kish
My Works in Progress 2022 piece, titled Around the Clock, is about the progression of time and energy throughout a common weekday. Work is stressful and busy, but once you arrive at home, it is comfortable and relaxing. The stage is set up as a clock with the upstage centre being 12 o'clock, stage right being 3 o'clock, downstage centre being 6 o'clock, and stage left being 9 o'clock. This invisible configuration creates four invisible quadrants. Each quadrant has a different dynamic and a different tempo, or speed. This is to symbolize the many amounts of energy one has overtime, specifically, throughout a weekday. In the beginning of the piece, the three dancers, Christopher Brown, Bel Housner, and Lindsey Salkeld, briskly walk to their first formation in the 6 o'clock to 9 o'clock quadrant. From the start, they dance in unison, but individually, representing how people focus and worry solely on themselves in the mornings. As the piece advances and they travel around the clock, and therefore, the quadrants, they begin to acknowledge, partner, and dance with each other. The resolution of this piece is located in the 6 o'clock to 9 o'clock quadrant, which is where the "day" (piece) began, showing they just experienced a 12-hour day. Over these 12 hours, the energy and speed changed from quick and sharp to slow and continuous.

Theatre

9:45am-10:00am
Tunnel Vision
Presenter(s): Bianca Beach
Advisor(s): Tamiko Washington
Tunnel Vision is a one-act, one-woman show that is being written and performed by Bianca Beach. Bianca is a senior BFA in Theatre Performance major with a minor in Leadership Studies, and was admitted into Chapman's Master's in Leadership Development (MLD 4+1) program. The show, which will run between an hour and an hour and fifteen minutes, is Bianca's journey from sight, to stricken with legal blindness at age eleven, and back again; ten years older, she now faces Glaucoma. Tunnel Vision is an exploration of what we "see" through life; the light, the dark, and the shadows in between. Audiences will follow Bianca as she navigates themes of trauma, coming of age, perseverance, and fights against time of her degenerative condition to move audiences to action for research advocation and finding a cure. There are three million people in the United States alone affected by Glaucoma, and Bianca hopes the production of this show is the first step of many to finding and making a cure accessible. The show performs May 14th, 2022, and Bianca's medical professionals - including her doctor on the research team for the Glaucoma Research Foundation - will be in attendance provided there are no schedule conflicts. The production is also being filmed and edited by a professional editor who works for Disney so that a proof of concept can be submitted to PhilmCo., a company that produces films which have a philanthropic purpose. Her faculty mentor, Associate Professor Tamiko Washington, is Interim Chair for the College of Performing Arts, and is supporting the project by providing rehearsal and performance/film space for the production. Bianca's other mentor is Lecturer Wendy Kurtzman, who works for PhilmCo. Bianca is excited to raise awareness and take steps toward finding a cure for Glaucoma through showcasing her personal experiences through art.

AF 209 A

Communication Studies

10:00am-10:20am
Consumption of Horror Media and Fear of Reality
Presenter(s): Catthy Ha, Belle Kunzmann
Advisor(s): Dr. Austin Lee
Research on the psychology of horror media suggests that people tend to consume media with simulated threats that they perceive as convincing, depending on their own beliefs regarding horror themes. This research study is built on the cultivation theory, which examines how media can have lasting effects on people. While the original theory is about news consumption, this research will employ it in examining the extent to which individuals are affected by the horror media they consume. One of the main assumptions of this theory, the mean world syndrome, tells us that heightened levels of fear from consuming increasing amounts of horror media can impact viewers' fears, loneliness, and depression. People often avoid horror media, noting that it will cause them to have more anxiety over the fear of it coming to life. This can include the fear of seeing ghosts, worry that something will jump out in the dark, fear of death, etc. These are the ways that we plan to measure fear of reality. Participants completed a questionnaire including an evaluation of their consumption of horror media, a scale to measure their fears, and the General Anxiety scale. The survey begins with a question that asks them to select what they watched from a list of horror movies and television shows. This is followed by a scale that asks them to gauge their consumption of horror media compared to the average person. These two questions aim to determine if the participant is an avid horror media consumer or not. After this, a list of fears and the General Anxiety scale are built into questions that aim to determine participants' fears and levels of anxiety. The list of fears chosen is based on a survey that examined the concerns of average Americans. It is expected that there will be significant correlations between increased consumption of horror media and fear of reality.

10:20am-10:40am
TikTok & Mental Health
Presenter(s): Taylor Van-Inouchi, Cierra Robinson, Alexander Reyna, Olivia Brand
Advisor(s): Dr. Austin Lee
The increasing popularity of the social media app, TikTok, has promoted research on the effects TikTok has on its users mental health. The goal of this study is to determine the relationship between excessive TikTok use and its effect on mental health in college students. We hypothesize that excessive exposure to TikTok videos will have a negative impact on its users mental health. This research is conducted through an online self-reported survey, which measures TikTok exposure and mental health. In order to measure TikTok exposure, we used multiple choice questions, which will help us receive an accurate understanding of the participants perception of TikTok and how it applies to TikTok's overall effect on its users. We measured mental health based on the WHO-Five Well-Being Index (WHO-5), which asked participants five positively worded questions that measured one's well-being. It is expected that there will be a negative correlation between TikTok exposure and mental health.

10:40am-11:00am

The Ethical Concerns of Sports Betting

Presenter(s): Gracie Marx, Samuel Speight, Harry Cohen, Jeremy Becker
Advisor(s): Dr. Austin Lee

This study aims to understand the relationship between the increase in sports betting participation and the ethical concerns surrounding it. Sports betting has become very popular in the past year with approximately $57.22 billion dollars wagered in the United States in 2021 (Forbes). Sports bettors can gamble on a series of different platforms such as Sportsbook apps, casinos, and offshore books that are considered not legal. A Sportsbook is defined as an establishment that takes bets on sporting events and pays out winnings. Some of the most popular Sportsbooks are FanDuel, DraftKings and Caesars. With the rise in sports betting participation, the ethical conversations around gambling have increased. We believe that the increase in sports betting participation throughout the world decreases the level of ethical concerns surrounding sports gambling. We are in a sports world now that is dominated by sports betting. Companies have gone all in on the idea that sports betting is the future and will be around for a long time. Ethical concerns surrounding sports betting are triumphed by economic opportunity. For this study, a survey was administered through Qualtrics with a series of questions about sports fandom and sports betting habits. The survey consisted of undergraduate students at a private university in Southern California.

AF 209B

Communication Studies

10:00am-10:20am

Face Masks and Interpersonal Attraction

Presenter(s): Axel Stone, Jena McGarey, Michael Tinio, Jillian Morris, Jerome Vincent, Daniel Futral

Advisor(s): Dr. Austin Lee

Throughout the COVID-19 pandemic, many researchers have been investigating the interpersonal and social effects of wearing face masks. Our interest is to extend this research on masks by exploring how face masks affect the judgment of interpersonal attractiveness. We predict that wearing a mask will result in higher scores in all three dimensions of interpersonal attraction (physical, social, and task attraction), compared to non-mask wearers due to the partial information effect (Sadr et al., 2019). Participants are expected to find someone more attractive if they see their face as fragmented, blurred, or otherwise partially obstructed. Our online experiment on Qualtrics will employ a post-test only control group design. Our independent variable will be the experimental stimuli (wearing a face mask vs. not wearing a face mask) that will be randomly presented to the participants. Our dependent variable will be J.C. McCroskey's measures of interpersonal attraction.

Film

10:20am-10:40am

Dodge College Undergraduate Thesis Film Neo's Cleaning Service

Presenter(s): Yuka Saito, McFloyd Nguyen

Advisor(s): Madeline Warren, Christina Fugate

As the modern working society of any global economy experiences exponential growth in work-centric culture, the integrity of communal and family values degrades as a result. Factors such as lack of leisure and human interaction directly correlate to the declining number of marriages, hence exposing an aging population with no reinforcement. Collectively, as a result, the number of elderly people who live alone continues to expand, and in places such as modern-day Japan, the phenomenon of "lonely death" or kodokushi - 孤独死, an occurrence of people dying alone and remaining undiscovered for a long time, has been a remarkable issue. Neo's Cleaning Service is a 2022 undergraduate thesis film at Dodge College of Film and Media Arts. The story takes place in a dystopian world where retired seniors are deemed as a burden to society. Inspired by the Japanese societal issue of kodokushi (lonely death), the film questions the value of a late person's legacy and casts light on senior citizens who are too often forgotten or neglected by our work-centric culture. The young protagonist, Tim Bauer, is a social cleaner whose job is to dispose of seniors' belongings. The nature of Tim's job makes him perceive these memorabilia as salvageable junk, despite the fact that this "junk" once belonged to someone who cherished it dearly. Thanks to the unexpected encounter with Paul, a supposedly recalled (taken away) senior citizen, Tim finally takes the time to look at the things he has been mindlessly tossing away, hence undergoing a sense of awareness. The film looks to raise awareness of the current global issue of senior abandonment through a sensationalized lens of science fiction.

Psychology

10:40am-11:00am

Self-Efficacy of Parents of Children with Autism

Presenter(s): Giulia Sarti

Advisor(s): Dr. Desiree Crevecoeur-MacPhail, Dr. Tara Gruenewald

Self-efficacy is the theory developed by Albert Bandura (1977) that describes how people will exert effort into a specific domain if they believe they will be successful. Parents of children with autism encounter challenges that may affect their self-efficacy regarding parenting their child. Variables such as confidence, support from professionals, age of the child, and sex of the child were investigated to determine the impact on the self-efficacy of parents. Through an online survey parents completed questionnaires examining their self-efficacy, confidence, and support they felt from professionals. Expected findings are that parents who are more confident report higher self-efficacy compared to parents who report lower levels of confidence. Parents who feel more supported by professionals also indicate higher levels of confidence. Parents of children who are between the ages of two to 13 years old report higher levels of confidence in their ability to care for their child. Lastly, parents of children who are female also report higher levels of confidence in their ability to be involved in their child's treatment plan. These findings may offer parents and professionals an awareness of what variables impact parents, and most importantly the child. Assuming statistical significance, more evidence-based practices could be created, and better support can be offered to foster strong parent self-efficacy. Ultimately, having a strong team, of parents and professionals, surrounding a child there is greater opportunity for them to succeed and develop.

AF 209C

Psychology

10:00am-10:20am

Childhood Trauma and Attachment and Personality in Adulthood

Presenter(s): Lydia Steinhoff

Advisor(s): Dr. Desiree Crevecoeur-MacPhail, Dr. Tara Gruenewald

The pathology of personality and how it is formed, developed, and/or organized has always been a subject of interest in psychology. Of late, researchers are more specifically directing their attention to the connection between early experiences (e.g., childhood trauma) and the development of adult personality disorders. However, less empiric attention has been applied to the psychological mechanisms of the development, nor its influence on dimensional personality traits. Attachment theory can explain both the intrapersonal and interpersonal difficulties commonly found in individuals with personality disorders (Levy et al., 2015). Theory suggests that attachment insecurity is associated with personality pathology. Levy et al. (2015) explained that personality traits are characterized by significant interpersonal challenges, stemming from underlying maladaptive attachment schemas. In some cases, these schemas are transmitted directly from parents who themselves suffer from attachment issues, poor affect regulation, and poor relationship management. As further evidence, Sarkar and Adshead (2018) conducted developmental and neurobiological research which found that disordered personality traits can be understood as disorganization of the capacity for affect regulation, mediated by both early attachments and parenting style. The current research study expanded and established the potential mediating influence of attachment type between specific types of childhood traumatic experiences, attachment styles, and the development of specific adult dimensional personality traits. Undergraduate students within the Department of Psychology at Chapman University were recruited and acted as the participants in this online study. The participants in the study were asked to complete surveys/questionnaires regarding their attachment style, childhood trauma (specific type), and personality traits. It is predicted that adversity/trauma experienced in childhood has a profound effect on attachment style (increasing insecurity) which, in turn, disrupts personality development.

10:20am-10:40am

Educator Experiences and Job Satisfaction

Presenter(s): Kiyono McDaniel

Advisor(s): Dr. Tara Gruenewald, Dr. Desiree Crevecoeur-MacPhail

Since the COVID-19 pandemic, online education was a new technology that many higher education institutions implemented into their curriculum. Online education was, and still continues to be, relatively new, and previous research focused on online education from the student's perspective. Professors and instructors were often dismissed in this research even though online education, and more specifically online teaching, required many skills that they were unfamiliar with or untrained for. Successful students are active contributors to society in part from educators who are able to share their experiences, ideas, and breadth of knowledge. The current correlational study aimed to gain a better understanding of Chapman University educator perspectives on online education by analyzing job satisfaction, perceived supervisory support, faculty burnout, and job security as they're related to the impact of stressors from

online teaching. The purpose of this research study was to analyze faculty opinions with online teaching given the increasing rate of online learning opportunities. It was expected that instructors who experienced more stressors from online teaching would report lower levels of job satisfaction, perceived supervisory support, and job security, as well as higher levels of burnout. Many stressors that Chapman faculty experienced due to online teaching were not restricted to just teaching at Chapman. A similar experience of distress and discomfort from online teaching, and remote work in general, were applicable across many universities and work sectors. With these results, this study provided insight on how professors experienced online education, what changes could be made for efficient online learning programs in the future, and what university systems could do to support their professors inside and outside of the classroom. The results of this study can guide other institutions that are engaged in online instruction who struggle with similar issues as the faculty at Chapman University.

10:40am-11:00am

Healthcare Satisfaction and Accessibility Among LGBTQ+ College Students

Presenter(s): Debbie Nguyen

Advisor(s): Dr. Tara Gruenewald, Dr. Desiree Crevecoeur-MacPhail

There are many disparities in access to healthcare and medical insurance. LGBTQ+ students are highly vulnerable members of society and often experience more negative health outcomes (Gilbert et al., 2021). Through a lens of Minority Stress Theory (Meyer, 2003), the present study aimed to understand one aspect of the differences between LGBTQ+ and non-LGBTQ+ students in relation to healthcare experiences. Students 18+ (N = 230) were surveyed through Qualtrics. Participants were asked various demographic questions such as age, sexual orientation, and ethnicity. In addition, participants were asked specifically about their health insurance status, if their providers utilized inclusive language, and their attitudes towards their college/university health center. Validated measures for healthcare satisfaction were included. We anticipate that students will report higher healthcare satisfaction if: a) they have always been insured, b) if they do not identify as LGBTQ+, and c) if they perceive that their providers utilize inclusive language. In addition, we expect that LGBTQ+ students will report a greater likelihood of using their college health center if they are aware that their providers are educated on LGBTQ+ health issues. These findings indicate that there is a disparity between student healthcare experiences. LGBTQ+ students experience lower healthcare satisfaction, indicating that there is a need for more educated healthcare professionals. In addition, uninsurance is a major public health issue, as many individuals cannot access the care they need. It is important to understand these disparities in order to work towards creating systemic change for more equitable and accessible health care.

Biochemistry and Molecular Biology

1. ***Where Does CowN Bind to Nitrogenase?***
   Presenter(s): Emily Wong, Sophia Kelsey, Brendalyn Figueira, Dustin Willard
   Advisor(s): Dr. Cedric Owens

Nitrogen fixation occurs through two major processes: the industrial Haber Bosch process and via an enzyme called nitrogenase. A major drawback of the Haber Bosch process is that it requires high temperatures, high pressure, and high amounts of fossil fuels, thereby negatively impacting the environment. With the enzyme nitrogenase, dinitrogen gas is converted into ammonia using biological energy in the form of ATP, creating a more environmentally friendly nitrogen fixation process. If we were able to increase the usage of biological nitrogen fixation, the need for fertilizers would be reduced. Nitrogenase is known to be inhibited by carbon monoxide (CO), meaning that when CO is present, nitrogen fixation via the enzyme will not occur. Cells containing nitrogenase must find a way to avoid inhibition. It was discovered that nitrogenase is protected by another protein, CowN, which allows for the reduction of nitrogen with nitrogenase even under the presence of CO. Two potential binding sites were found where CowN could bind to nitrogenase: at the entrance of a proposed CO channel or near the active site of nitrogenase. Both could, in principle, prevent CO from reaching the active site and thus avoid inhibition by CO. The goal of this project was to determine where CowN binds to nitrogenase. We used two different methods to investigate where CowN binds: chemical crosslinking that forms a permanent covalent bond between CowN and nitrogenase, and co-crystallization of CowN and nitrogenase that will lead to a structure of the protein complex.

2. ***Characterizing the Interaction Between MoFeP and CowN***
   Presenter(s): Sophia Kelsey, Max Strul, Emily Wong, Dustin Willard, Brendalyn Figueira
   Advisor(s): Dr. Cedric Owens

Nitrogenase is an enzyme made up of MoFeP (Molybdenum Iron Protein) and FeP (Iron Protein) whose function is to reduce nitrogen to ammonia. Carbon Monoxide (CO) is known to inhibit nitrogenase's enzymatic activity. Another protein called CowN provides protection against the inhibitory action of CO and restores nitrogenase's function. We recently discovered that MoFeP and CowN interact to provide protection, however, the location of the binding site is unknown. Our goal is to characterize the protein-protein interaction between MoFeP and CowN by co-crystallizing these two proteins and solving the structure of the complex. This work describes our efforts to determine the CowN-MoFeP co-crystal structure. We set up crystal trays using a variety of conditions including those that yielded MoFeP crystals in the past (100uM Na Cacodylate, 300uM NaCl and 45% MPD). We varied the pH between 6 and 9 and changed the protein concentration as well as the ratios of CowN and MoFeP. Furthermore, we also tried to crystallize a CowN-MoFeP complex that was stabilized by covalent crosslinking.
We obtained crystals from several conditions with high quality diffraction patterns. Processed the data and solved the structures using a program suite that included ccp4i, coot and PyMOL. Our results indicate that only saw MoFeP is visible in the crystal structure. We interpret these results in two possible ways. Either CowN is present in a CowN-MoFeP complex but not ordered in the crystal lattice, or only MoFeP is crystallized. We will next try a new series of crystalization conditions that includes reducing the salt concentration and increasing MPD concentration to encourage protein-protein interactions.

3. ***Characterizing the Interaction Between MoFeP and CowN with Fluorescence***
   Presenter(s): Brendalyn Figueira, Sophia Kelsey, Emily Wong, Dustin Willard
   Advisor(s): Dr. Cedric Owens

Nitrogenase is an enzyme complex consisting of two proteins, the catalytic molybdenum-iron protein (MoFeP) and its reductase, iron protein (FeP). Nitrogenase catalyzes the reduction of nitrogen gas to ammonia but is inhibited by carbon monoxide gas (CO). Another protein, known as CowN, protects nitrogenase from CO inhibition. We have shown that there is an interaction between CowN and nitrogenase, however, we do not know how strongly the two proteins interact or where CowN binds to nitrogenase. We hypothesize that the binding site is near a potential CO channel in MoFeP. A method of measuring interactions between two proteins is fluorescence quenching, in which the fluorescence of one protein is quenched upon interaction with another. We will investigate MoFeP-CowN interactions through fluorescence quenching experiments. We will tag the MoFe protein with a fluorophore, Rhodamine Red C2 Maleimide, and CowN with a quencher, QSY-9 Carboxylic Acid, Succinimidyl Ester. Then, we will measure the decrease in fluorescence as a function of increasing the concentration of CowN, and we will test if the strength of the interaction depends on the presence of CO gas. Furthermore, by labeling MoFeP and CowN at specific residues and measuring quenching, we will determine where on MoFeP CowN binds.

4. ***Biomechanics of Hagfish Burrowing***
   Presenter(s): Larissa Atkins, Josh Lee
   Advisor(s): Dr. Douglas Fudge

Atlantic Hagfish are deep sea eel-shaped fish which dwell at the bottom of the Atlantic Ocean. Living at great depths, these creatures are well known for burrowing into the ocean floor sediment, but little is known about how they burrow. To investigate burrowing mechanics in this species, we used a specialized acrylic burrowing chamber to observe hagfish burrowing in mud-like substrates. We used gelatin as a substrate, because it approximates the properties of mud and because it is transparent. Building upon the research from last semester, as well as previous years, some observations have been made. They clearly have two phases of distinct locomotion styles. For the first portion of their burrow, they thrash the back half of their body to produce the force needed for crack propagation. However, there is a turning point where they cease tail thrashing and switch styles to their “wriggle” style. This style is clearly different because there is little to no movement in the tail observed. Instead, nearly all the movement is observed around their head. In the research done this semester, one objective was to determine what locomotion style they utilize in the wriggle phase. It was hypothesized that they are utilizing both internal concertina and whole-body concertina in this phase. Whole-body concertina is when hagfish use static friction force present between their body and the substrate (in this case, gelatin) to anchor their body and repeatedly fold and unfold their body. With internal concertina, this act is performed under their skin. This semester we’ve collected data on burrow characteristics, including burrow duration, shape, thrashing time (first phase of burrow), wriggle time (second phase of burrow), maximum and relative depth, maximum and relative horizontal distance, maximum and relative tail exposure, water temperature, and hagfish length. Preliminary analysis of the data suggest that hagfish usually burrow in “U”-shape and maximum burrowing time is 5 minutes, with most of that time spent in the wriggle phase.

5. ***Aplysia Californica Opaline Gland Vesicles***
   Presenter(s): Owen Tapia
   Advisor(s): Dr. Douglas Fudge, Dr. William Wright

When threatened, the sea hare (Aplysia californica) releases two compounds: ink and opaline. Of these two, ink is highly studied in respect to its chemical properties as well as its release mechanism. However, opaline, the other secretion of this organism is still quite unknown. Opaline when released into sea water forms a viscous mucus, which along with ink helps against predation. The opaline gland sacs are roughly 0.07 – 2.0 mm and possess small muscles that allow for the contraction of each of the sacs. These sacs are all connected to a central canal within the opaline gland which lead to a siphon where the opaline is released. My research has shown that opaline glands secrete membrane-bound vesicles with a diameter of about 1 um, but it is not known how these vesicles interact with seawater to form the final opaline mucus. To explore how these vesicles are stabilized in the opaline gland and their mechanism of deployment after they contact seawater, we are developing an assay that will allow us to measure the efficacy of opaline formation when vesicles are mixed into solutions with various ionic and osmotic properties.

6. ***Leaf Chemical Profiling of Two Fabiana Species and their F1 Hybrids***
   Presenter(s): Kylie Deer
   Advisor(s): Dr. Hagop Atamian

The genus Fabiana belongs to the family Solanaceae and is native to the dry regions of Patagonia and the central and southern Andes mountains. Some of the 15 known Fabiana species have been used in traditional medicine as a diuretic, a digestive, and for kidney diseases. Diverse chemical classes have been identified in F. imbricata, but to our knowledge this is the first report of chemical profiling in F. viscosa, which is endemic to Chile. In this project, we generated an F1 generation from a cross between F. imbricata and F. viscosa. Leaves from the parents and 11 F1 plants were freeze dried, ground to a fine powder, and extracted with 100 µl/mg of monophasic extraction solvent (30:30:20:20 acetonitrile, methanol, isopropanol and water). The extracts were subjected to LC-MS metabolomics analysis on a Synapt G2-Si quadrupole time-of-flight mass spectrometer coupled to an I-class UPLC system. Separations were carried out on a CSH phenyl-hexyl column (2.1 x 100 mm, 1.7 µM). A total of 271 compounds were identified belonging to diverse chemical classes. Carboximidic acids, naphthalenes, and oxylipins were significantly abundant in F. viscosa, while flavonoids and prenol lipids were significantly abundant in F. imbricata. F1 plant profiles represented a mosaic of the parental profiles. Interestingly, some flavonoids showed significantly higher abundance in F1 plants compared to either parent. The results from this project will be useful in understanding the genetics underlying the production of the different compounds by these two species in the future.

7. ***Investigating the Interaction between Calmodulin and Individual HIV-1 Matrix Protein Domains***
   Presenter(s): Kacie Sakamaki
   Advisor(s): Dr. Jerry LaRue

HIV-1 is a widespread disease that affects millions of people world-wide. The HIV-1 Matrix protein (MA) plays a crucial role in the reproduction cycle of the HIV virion. In the host cell, MA interacts with protein Calmodulin (CaM) which is a calcium-sensor protein that is predicted to be necessary for HIV reproduction.

A better mechanistic understanding of the MA-CaM interaction is key to disrupting this protein-protein binding, a promising avenue for antiviral development. Previous research has shown that the interaction is calcium dependent because of CaM's open confirmation only when bound to calcium, allowing CaM to interact with many proteins in the body, including MA. The conformational change of MA when bound to CaM was found to decrease the compact structure of MA, exposing its binding sites. It is unknown however, how the C and N terminals of HIV MA protein interact with CaM independently. Fluorescence spectroscopy was used to study the MA-CaM interaction in both calcium and non-calcium (APO) conditions. Full MA protein, the N-domain MA half protein, and the C-domain MA half protein were tested with full CaM protein. The results confirmed the calcium dependency of MA-CaM binding with fluorescence data showing little to no binding in all experiments under APO conditions. Both full MA protein and N-domain MA half protein successfully bound to full CaM in calcium conditions resulting in a conformation change (identified by a shift in emission peak, known as a blue shift). The C-domain MA half protein, however, showed no significant changes in fluorescence indicating little to no binding with CaM. Taken together these findings suggests that N-domain MA binding to CaM must be a prerequisite for C-domain MA binding. Fully understanding the interactions between HIV-1 MA and CaM might be a potential pathway to finding an effective cure to HIV-1.

8. ***Exploring Interactions Between Alpha-Synuclein and Calmodulin***
   Presenter(s): Davis Mau, Julie Tran, Andrea Sandoval, Kacie Sakamaki
   Advisor(s): Dr. Jerry LaRue

Parkinson's Disease (PD) is the second most common neurological disease with over 60,000 Americans diagnosed each year. Currently, there are no permanent treatments for PD, only medications that can improve symptoms such as deep brain stimulation. Alpha-synuclein (α-syn) is a protein found in all brains, however, in those with PD, α-syn aggregates as the major protein component in the formation of the core of Lewy bodies (LB). LB consist of an abnormal aggregation of certain proteins in the brain and their presence is a hallmark trait of PD. Calmodulin (CaM) is a small multi-functional protein found in all cells and has been found to be upregulated in those afflicted with PD. The exact relationship between α-syn and CaM is unknown, however, patients with PD show increased concentrations of α-syn and CaM. Our research focused on determining the binding between α-syn and CaM and the role of calcium in this interaction. which then allows the proteins to form the core of Lewy bodies. We utilized fluorescent spectroscopy to track changes in signal from fluorescent tags attached to α-syn based on concentrations of CaM and calcium. Changes in fluorescence indicate binding as the tags' local environment is being altered. Our data suggest that there is a higher binding of α-syn and CaM in calcium conditions based on higher fluorescent signal interference. On-going experimentation and analysis are aimed to generate KD values to quantify differences in binding.

9. ***Assessing the Down-Regulation and Inhibition of Androgen Receptor Expression in Triple-Negative Breast Cancer using Apigenin***
   Presenter(s): Doris Yang
   Advisor(s): Dr. Marco Bisoffi

The purpose of this project is to investigate the down-regulation or inhibition of androgen receptor (AR) expression by testing the natural product apigenin on breast cancer cells. The chemical structures of known inhibitory natural products to AR were used to computationally dock to a model of AR and measure

their binding scores. To compare, a physical binding score of DHT, a positive control substrate to the ligand binding domain of AR, was -36, whereas the score for apigenin was -38 and exhibited the strongest physical interaction to AR. Due to its androgenic effects, apigenin was hypothesized to be a potential drug candidate for triple negative breast cancer (TNBC). Previous research suggests AR expression in TNBC is highly significant, in which the potential pro-cancerous role of AR is vital in the advancement of TNBC treatment. Breast cell lines MCF10-A (non-malignant breast epithelial cells), MCF-7 (estrogen and progesterone receptor positive breast cancer), and MDA-MB-453 (triple negative breast cancer cells) were cultured and treated with apigenin. Concentrations of 0 uM, 25 uM, and 50 uM of apigenin were used to treat the cell lines. SDS-PAGE and Western blot analysis suggests there may be post-translational inhibitory effects on AR in cell lines MCF-7 and MDA-MB-453 when comparing the control to treatment with apigenin. Analysis also concluded MCF10-A lacked expression of AR. qRT-PCR was performed to investigate post-transcriptional effects of apigenin on the cell lines but had inconclusive results. Treatment of apigenin showed significant down-regulatory effects of the AR in breast cancer lines and may fill the gap on how antiandrogens behave on both non-aggressive breast cancer and TNBC cells.

10. ***Synthesis and Testing of Novel Platinum Drug Therapies for Prostate and Breast Cancer***
    Presenter(s): Tamara Elenberger
    Advisor(s): Dr. Marco Bisoffi, Dr. Allegra Liberman-Martin

The field of oncology has created several therapies that are available for treating cancer. While these options can vary at the beginning of a cancer patient's journey, as certain treatments fail, fewer alternatives are left, and more caustic drugs must be considered. Platinum drugs are one of those final options. Currently, there are few platinum-based drugs that do not come with painful side-effects or have more harmful consequences on a patient's health than their ability to treat cancer. Based on this lack of effective therapies, the main purpose of this research project was to synthesize and evaluate novel platinum drugs on prostate and breast cancer cells. The overall goal of the project was to test if these drugs could diminish the proliferation of cancer cells while mitigating the damage done to healthy normal cells of the same type. Two new platinum drugs, platinum pincer compounds [NCN]PtCl and [NCN]PtCH3 were synthesized and then tested on cancer cells. The drugs were tested on breast and prostate cancerous and non-cancerous cell models at varying concentrations and then analyzed using a cell proliferation assay that detects the cells' ability to metabolize under treatment. The data collected from those experiments is being processed using standardized statistical methods to create figures that will indicate which cells are affected and to which extent. Initial findings indicate that these platinum drugs decrease the proliferation of both prostate and breast cancer cells at a particular concentration of 10 micromolar, with there being more noticeable effect on breast cancer cells. Additionally, the methyl-substituted platinum drug appears to perform better at reducing the proliferation of cancer cells compared to non-cancerous cells. We have concluded based on current data processing that these novel platinum-based compounds could be used as leads for further drug development in prostate and breast cancer.

11. ***Computational Design of B-Fluorinated Morphine Derivatives for PH-Specific Binding***
    Presenter(s): Nayiri Alexander, Makena Augenstein
    Advisor(s): Dr. Matthew Gartner

The opioid epidemic impacted over 12 million Americans in 2019. Although they are effective pain-relieving medications, they carry addictive and dangerous side effects. Opioids, like morphine, bind non-

selectively in both central and peripheral tissues; however, dangerous side effects result from central activation. Inflamed conditions of injured tissues have a lower pH (pH=6-6.5) environment than healthy central tissue (pH=7.4). We aim to design a morphine derivative that binds selectively within inflamed tissue using computationally-based molecular extension and dissection techniques. Binding to the mu-opioid receptor (MOR) is dependent on protonation of the biochemically active amine group of morphine. Fluorination of a carbon beta to the tertiary amine group was used in order to reduce the pKa of the ligand through induction. By decreasing the pKa of morphine, protonation remains possible in lower pH environments of inflamed tissue, while remaining primarily deprotonated in healthy tissue. A cyclohexane and pyridine ring were removed to increase conformational flexibility when binding to the MOR and maintaining biological function. Electronic structure calculations were performed with Gaussian 16 using the Keck Computational Research Cluster at Chapman University. The theoretical pKa values were determined at the M06-2X/aug-cc-pVDZ//SMD level of theory to calculate the ΔG°aq values for the amine deprotonation reactions. Two morphine derivatives –D-fluoromorphine β-C1 and D-fluoromorphine β-C2– were made computationally and modeled within the MOR using Maestro: Schrödinger. Both derivatives show reductions in pKa and enhanced ligand protein interactions within the MOR. Beta-fluorination decreased the overall pKa values of the morphine derivatives (pKa: 6.1-7.83) relative to morphine. The reductions in pKa reduce the possibility of binding within healthy, central tissue.

Biological Sciences

12. ***Unraveling the Mechanisms of Hagfish Skein Deployment***
    Presenter(s): Lucy Chalekian
    Advisor(s): Dr. Douglas Fudge, Dakota Piorkowski, Andrew Lowe

Hagfish are a diverse group of jawless marine fishes that are known for their remarkable ability to produce copious amounts of gill-clogging slime when threatened. Following a single attack, a hagfish can produce over a liter of slime. The slime exudate ejected by the slime glands is made up of two main components: mucus vesicles and skein threads. The mucus is formed of crosslinked glycoproteins that hydrate to form a gel that holds water. Skeins are coiled keratin-like ellipsoid shaped bundles of thread that unravel from ~100-um structures to ~15-cm long threads that provide structure for the mucus. Together, the mucus and threads interact to form a slime that is 99.996% water. The transformation of ejected mucous and thread components into fully formed slime is remarkably fast, taking only 100-400 ms. How skein unraveling happens so quickly has remained elusive. There are two competing hypotheses that could explain the mechanism of skein unraveling. One hypothesis states that unravelling occurs when a skein become pinned to a solid object, with water flow past the skein driving unraveling. Another possibility is that skeins become embedded in an elastic matrix of mucus and as the mucus deforms with flow, it loads skeins in tension and effects unraveling. We used a high-speed camera and optical microscopy to observe skein unraveling at the microsecond time scale. Our results provide strong support for the hypothesis that skein unravelling is driven primarily by deformation of the soft elastic mucus in which they become embedded shortly after exudate is ejected from the slime glands.

13. ***Hagfish Slime Mucous Vesicle Deployment in Seawater***
    Presenter(s): Anne Kenney
    Advisor(s): Dr. Douglas Fudge, Dakota Piorkowski, Andrew Lowe

Hagfish produce a large quantity of defensive slime when attacked. This slime is a rapid forming dilute hydrogel comprised of two main components, thread filaments and membrane-bound mucin vesicles. Little is known about the behavior of the mucin vesicles immediately after secretion from the slime gland, as all studies on mucin vesicles have used vesicles stabilized with polyvalent anions. The slime is known to form rapidly after secretion, taking between 100-400ms, however the speed of the hydration of the mucus component has not been quantified. In this study we observed and captured the behavior of fresh mucin vesicles with an inverted microscope when first introduced to artificial sea water. A small dab of exudate was placed onto a slide and then vitro tubes slowly introduced water. The resulting behavior was the rapid swelling and expansion of vesicles seen at high magnification and captured using a high-speed camera. Focusing on the expansion of individual edge vesicles after contact with artificial sea water showed the rapid hydration and expansion of many vesicles. The expansion rate of the mucin vesicles was much faster than any observed slime formation. Preliminary analysis averages 30ms hydration times with some individual vesicles hydrating in as little as 15ms, along with vesicle area expanding around 5-fold. This suggests that when slime is naturally formed the mucous gel may be the first component to deploy. These insights on the mucin vesicle hydration speed in fresh exudate will further contribute to research involving the mechanisms for hagfish slime formation.

14. ***Transcriptome Assembly and Comparative Analysis of Five Eryngium Species with Medicinal Properties***
    Presenter(s): Maxwell Lee, Yixing Zheng
    Advisor(s): Dr. Hagop Atamian

Eryngium is the largest genus of flowering plants in the family Apiaceae. The genus includes around 250 species which are extremely variable morphologically. Eryngium plants have various culinary uses and are also used as ornamental plants. In addition, several species have been widely used in traditional medicine. More than 120 compounds have been isolated and identified from 23 species of Eryngium. In vitro studies with Eryngium extracts have shown anti-inflammatory, anti-snake and scorpion venoms, antibacterial, antifungal, and antimalarial, antioxidant, and cytotoxicity against various human tumor cell lines. Despite their medicinal potential, no transcriptome sequences are available for any of the 250 Eryngium species. In this project, we sequenced and assembled the transcriptomes of E. Ametistium, E. Gigentium, E. Verifolium, E. Yuccifolium and the endangered species found across the European Alps E. Alpinum. A total of 70 million 150bp reads were generated and assembled to around 35 thousand contigs per species. The assemblies were annotated and shown to have 72-85% completeness. Comparative transcriptome analysis with tomato and carrot sequences identified number of sequences specifically present in Eryngium species. This is the first report of Eryngium sequences and will be valuable in understanding the genetics underlying some of the medicinal properties of the different Eryngium species.

15. ***Quality of Sleep, but Not Timing of Sleep, is Associated with Elevated Cytokine Levels***
    Presenter(s): Sarah Nunes
    Advisor(s): Dr. Jason Keller

Six out of ten adults in the United States will be diagnosed with a chronic disease. Chronic inflammation and overactive immune responses have been linked to an increased risk of cancer and other diseases. Poor sleep has been shown to play a role in the incidence of a number of inflammation-mediated diseases, including inflammatory bowel disease and cardiovascular disease; and, it is generally understood that certain proteins (cytokines) trigger these inflammations in response to low quality sleep. Much of this past work, however, has been limited to exploring the response of individual cytokines in response to poor sleep. The development and validation of multiplex assays now permit the evaluation of multiple cytokines simultaneously, which promises a more complete picture of the physiological links between sleep quality and inflammation. This study investigates the relationship between elevated cytokines with sleep quality and chronotype (e.g., morning type vs. evening type). We explored this relationship using the California Teacher's Study, a large cohort of female teachers (n=133,473) who have been studied from 1996 to the present day through regular questionnaires that are sent out periodically. The questionnaires allowed participants to self-assess lifestyle factors such as sleep quality and chronotype. A subsample (n=838) of participants had bio-specimens collected concurrently with the fifth questionnaire permitting the measurement of 16 cytokines using a multiplex assay. Self-reported very poor sleep quality was positively correlated with elevated IL-8, IL-10, IL-6Ra, and TNF-a. Although elevated IL-6Ra was associated with more evening than a morning person, the majority of cytokines did not show any significant association with chronotype. Taken together, these results suggest that California Teachers are at an increased risk for adverse health effects due to elevated cytokines when experiencing poor sleep regardless of the timing of that sleep.

16. ***A Pentavalent Modified Vaccinia Ankara-Based Virus-Like Particle Vaccine Against Epstein-Barr Virus Infection: Progress and Challenges***
    Presenter(s): Victoria Erickson
    Advisor(s): Dr. Javier Gordon Ogembo, Gabriela Escalante

Epstein-Barr virus (EBV) is the main cause of infectious mononucleosis and results in 200,000 new cases of EBV-associated malignancies each year. Since there's no prophylactic or therapeutic vaccine available against EBV, there are 145,000 global deaths each year resulting from EBV-associated malignancies. Previous clinical prophylactic EBV vaccine candidates, which used only the immuno-dominant EBV glycoprotein 350/220 (gp350), were unsuccessful. In addition, previous research demonstrated that combining five EBV glycoproteins important for virus entry in diverse cell types in an EBV-like particle (EBV-LP) vaccine elicits high titers of neutralizing antibodies in immunized rabbits. However, the EBV-LP construct isn't commercially scalable when produced in vitro, and overall immunogenicity can be improved. To produce a commercially-scalable prophylactic EBV vaccine and improve immunogenicity, we propose the use of the viral vaccine vector Modified Vaccinia Ankara (MVA) to produce the EBV-LPs both in vitro and in vivo. We use molecular cloning to generate the MVA-based vaccine that results in the production of pentavalent EBV-LPs to elicit a humoral immune response. Our previous recombinant MVA construct incorporated gB and gp350 into the same insertion site in a polycistronic expression construct with a single promoter, but after several viral passages in MVA-permissive cells the gB glycoprotein gene was lost due to genetic instability. Here we work to develop a new recombinant MVA construct in which

gB and gp350 are in separate insertion sites, to attempt to maintain genetic stability and adequate protein expression to render this a viable vaccine construct. We demonstrated successful insertion of gp350 into the recombinant MVA construct but failed to achieve insertion of gB. We propose sequencing and/or polymerase chain reaction to identify the cause of the failed insertion. Furthermore, we discuss potential modifications to our molecular cloning techniques to eventually achieve successful production of the final pentavalent construct.

17. ***Comparing qPCR and CFU to Verify Rhizobia Genotype Proportions***
    Presenter(s): Yoobeen Lee
    Advisor(s): Dr. Kenjiro Quides, Dr. Hagop Atamian

Legumes and rhizobia engage in a symbiotic relationship that is a model for studying microbial mutualisms. This interaction revolves around the nutrient exchange of rhizobia derived nitrogen for legume synthesized carbon that increases the growth of both partners. Therefore, measuring rhizobial population size can indicate the amount of beneficial nitrogen legumes receive. However, legumes interact with genotypes of rhizobia that provide varying levels of nitrogen, and it is unclear how rhizobial populations shift over time. Here, we use quantitative polymerase chain reaction (qPCR) to rapidly track simple, two-genotype, populations of rhizobia, and compare our results to a traditional colony forming unit (CFU) method for analyzing rhizobial abundance in more complex populations. First, we confirmed that qPCR yielded similar results to CFU estimation for rhizobial populations within individual nodules. Next, we passaged and tracked our rhizobial population proportions across multiple plant generations and found that genotypes that fix more nitrogen increased in population proportion over time. Taken together, data collected for individual nodules and the passaging experiment validated the qPCR method. These experiments demonstrate the utility of qPCR for future experiments interested in analyzing rhizobia genotype proportions and how they relate to the level of benefits legumes receive.

18. ***Exploring the Ecological Dynamics of Simple Rhizobial Artificial Populations using qPCR***
    Presenter(s): Teresa Hur
    Advisor(s): Dr. Kenjiro Quides, Dr. Hagop Atamian

The microbiome of a host can change within a single generation, and repeated exposure to the same species of host can eventually shape a microbiome to be beneficial. In our study, we used the Lotus japonicus-Mesorhizobium loti symbiosis to explore the dynamics of simple artificial rhizobial populations using qPCR. To explore these population dynamics, we conducted a rhizobial passaging experiment wherein rhizobial populations were serially transferred to rhizobia–free plants. According to the sanctions hypothesis, we expect M. loti genotypes that fix more nitrogen to attain greater population sizes over time. We tested the sanctions hypothesis in populations that started with two different combinations of M. loti genotypes. The first combination consisted of a mediocre strain and a non–beneficial strain. The second combination of M. loti genotypes included the wildtype, a mediocre, and a non–beneficial strain. For our mediocre and non–beneficial combination of M. loti genotypes, we did not find support for the sanctions hypothesis. However, we did find support for the sanctions hypothesis in our wildtype, mediocre, and non–beneficial strain combination. The experimental approach used here could only be accomplished using molecular methods, such as qPCR, because the mediocre and non-beneficial strains are indistinguishable through culture-based methods. By utilizing a rapid, relatively cheap, and powerful technique, such as qPCR, future studies will be able to investigate the ecological dynamics of dozens of other M. loti mutants.

19. ***Identifying Morphological Variations in Beetle Antennae that Contribute to Reproductive Signaling***
    Presenter(s): Ricardo Espinoza Hernandez, Leeyette Lolich, Alexa Ortega, Sarah Yang
    Advisor(s): Dr. Lindsay Waldrop

Strategies to find and attract mates for reproduction vary between all animal species but generally involve using visual or chemical signaling. The Lampyridae family of soft-bodied beetles and glow worms includes many firefly species that use either visual or chemical signals (pheromones) for long distance communication, before final close-up behaviors involving pheromones. Chemical signalers exclusively use pheromones over long distances to attract mates. Visual signalers rely on flash patterns created by a bioluminescent organ, located within the insect's abdomen, to attract mates. Despite differences in long distance signaling, both chemical and visual signalers share similar chemosensory sensilla on their antennae that aid in the capture of pheromones. Since visual signalers do not rely on long distance chemosensation, these firefly species may have morphological differences in their antennae in comparison to the chemical signalers. We hypothesize that visual signalers will have shorter, less densely packed chemosensory sensilla near the distal tips of the antennae. We used scanning electron microscopy to photograph the antennae of various species within the Lampyridae family, all obtained from the Natural History Museum of Los Angeles County. Measurements of the antennae, collected using ImageJ, will allow us to present a phylogenetically corrected least squares regression analysis of several evolutionary morphological features, including the number, type and position of sensilla, length of the full antenna, etc. to test the hypothesis that natural selection has relaxed on antennae of visual signalers, leading to morphologically distinct chemosensory sensilla.

Business

20. ***Gently Loved: a Framework for Two Sided Platforms***
    Presenter(s): Elissa Shorokhova
    Advisor(s): Dr. Cristina Nistor

Fashion is a way for customers to express their personality, to connect socially, to express their authentic self within a society and participate in a shared experience of consumption. Consumers may have different motivations for choosing what types of fashion they purchase and sell. “Used” or “second hand” apparel has been sold traditionally in brick-and-mortar stores, however technology advancements have allowed the newer consumers (eg Gen Z tweens or college students) to make purchases easily in an online context that mirrors social media environment engagement. The apparel, considered “gently loved”, is sold on two-sided platform with users being the buyers and sellers. We aim to understand the reasons for consumers to adopt “gently loved” fashion. We rely on previous literature and recent public press articles to develop a framework to understand the new market for used clothing.

Chemistry

21. ***Hydroboration and Cyclotrimerization Of Isocyanates Using A Cyclic Carbodiphosphorane Catalyst***
    Presenter(s): Ben Janda
    Advisor(s): Dr. Allegra Liberman-Martin

Hydroboration is an important reduction step in the synthesis of many organic compounds in chemical industry, as its resulting boron-containing products can undergo many useful transformations. Hydroboration reactions are typically catalyzed by precious metals, which is neither cost effective nor energy efficient because mining these rare elements expends a large amount of energy. As a less expensive alternative, the Liberman-Martin Group has investigated the use of carbodiphosphorane catalysts that can be synthesized via a straightforward two-step synthetic process. These catalysts are extremely reactive nucleophiles due to their resonance structure which places two lone pairs on the central carbon atom. This poster will analyze the effectiveness of a cyclic carbodiphosphorane for the hydroboration of isocyanate-containing compounds versus a competing cyclotrimerization reaction using the same catalyst.

22. ***Ketone Hydrosilylation Studies Using a Carbodiphosphorane Catalyst***
    Presenter(s): Liam Sullivan
    Advisor(s): Dr. Allegra Liberman-Martin

The objective of this research is to discover an effective, safe, and low-cost catalyst for ketone hydrosilylation reactions, which involve the addition of a silicon–hydrogen bond across a C=O double bond. Improving catalyst efficiency could benefit the organic synthesis industry, as carbonyl hydrosilylation is used industrially in the synthesis of alcohol products. Use of the carbodiphosphorane catalyst as a replacement for toxic heavy-metal-containing catalysts could reduce waste and emissions harmful to the environment, while also providing an alternative means for accomplishing ketone reduction. Using a cyclic carbodiphosphorane catalyst, we have compared catalytic activity toward acetophenone hydrosilylation for a range of 18 silanes, the most effective of which was diphenylsilane. A range of 24 alkyl and aryl ketones have also been investigated. The carbodiphosphorane catalyst was more active in ketone hydrosilylation reactions compared to other nucleophilic organic catalysts tested.

23. ***Mechanism and Chemoselectivity Models for Hypohalous Acid Sensing at a Zinc-Sulfur Complex Implicated in Bacterial Redox Signaling***
    Presenter(s): Morgan Grimes
    Advisor(s): Dr. O. Maduka Ogba

Bacteria that colonize animal host systems utilize tetrahedral zinc-sulfur complexes in their cellular defense system against neutrophilic bursts of reactive oxygen species (ROS) at sites of inflammation. Of the several ROS characterized in this oxidative burst, hypohalous (HOCl and HOBr) and hypothiocyanous (HOSCN) acids are among the most potent for killing the invading pathogens. It is known that HOX-sensing occurs through oxidation at the zinc-bound cysteine(s) and consequent geometric disruptions at the metalloprotein. However, experimental reports suggest that HOCl/HOBr oxidation reactivity may be fundamentally different from that of HOSCN. In this work, density functional theory methods is used to investigate the likely mechanism for HOX-sensing at zinc-sulfur complex. The preferred oxidation

pathways using HOCl, HOBr, and HOSCN have been computed and compared to illuminate reactivity differences that explain experimental observations. The computational data reveal (1) the role of minimizing geometric strain at the zinc center in controlling the mechanistic preference and chemoselectivity for cysteine oxidation when comparing HOCl, HOBr, and HOSCN, and (2) the role of the counterion produced in the reaction in facilitating the localized geometric disruption that launches the signaling cascade within the bacteria.

24. ***Catalytic Reduction Mechanisms Mediated by Half-Sandwich Iridium(III)- and Rhodium(III)-Sulfur Complexes***
    Presenter(s): Ka'Naysha Scott
    Advisor(s): Dr. O. Maduka Ogba

Transition metal complexes have been widely employed as homogenous catalysts for hydrogenation and related reduction chemistry, many of which require harsh conditions. Despite the inspiration from nature optimized metal-sulfur complexes (i.e., nickel-iron hydrogenases) for hydrogen gas activation under mild conditions, a relatively small number of synthetic metal-sulfur variants have been reported. Experimental reports show that a series of so-called half-sandwich metal-sulfur complexes have been successful at facilitating hydrogenation and reduction. However, closer observation of select experimental data reveals varied reactivity across the reported complexes, and little is known about the factors that control such deviations in catalyst effectiveness, limiting our ability to develop more optimal bioreminiscent catalysts. These variations serve as the foundation for this project. Density functional theory calculations have been performed to investigate the likely mechanisms for the reduction (hydrogenation and hydrosilylation) of ketones mediated by half-sandwich iridium(III)-sulfur and rhodium(III)-sulfur complexes. Several computational model systems were employed to reveal the role of the metal, ligand coordination, and reducing agent on the energetically preferred mechanistic pathway. In this poster, insights from the computational work will be presented.

25. ***Mechanistic Insights into the Use of Carbodiphosphoranes as Lewis-Base Catalysts***
    Presenter(s): Gabriela Nerhood
    Advisor(s): Dr. O. Maduka Ogba, Dr. Allegra Liberman-Martin

Carbodiphosphoranes (CDPs) are divalent carbon[0] compounds with unusual electronic properties that make them highly reactive and unstable. CDPs have historically been used as strong sigma donors in organometallic complexes. Recent experimental work, however, have shown for the first time the use of CDPs as effective catalysts in the hydroboration of ketones and imines, rivaling other common Lewis base catalysts. Mechanistic details into the activation modes and consequent catalytic reduction afforded by CDPs are unknown. In this work, we use density functional theory methods to investigate several plausible mechanisms stemming from the CDP-substrate adducts formed in the reaction and reveal which catalytic pathway is energetically likely. Detailed analyses of developing charges and frontier molecular orbitals reveal why carbodiphosphoranes are effective Lewis-base catalysts, even when challenging substrates are employed.

26. Understanding the Transition from General to Organic Chemistry

Presenter(s): Hannah Chan

Advisor(s): Lauren Dudley

Organic chemistry is commonly known to have high failure rates and regarded as one of the most difficult courses offered in undergrad. This study assessed whether a modified general chemistry curriculum allowing for more time focused on foundational organic chemistry concepts in general chemistry can improve students' grade outcome and/or self efficacy when transitioning from general to organic chemistry courses. Two separate variables were tested: grade outcome and self efficacy. Using an independent sample t-test, a comparison of the two groups (modified versus traditional general chemistry) was performed. Grades were assessed by giving students four questions (out of 4 points total) based on acid base chemistry, which were scored and summed to represent students' grade outcome. A total of 79 students were evaluated, 29 of which participated in the modified general chemistry course while 50 participated in the traditional general chemistry courses. Modified general chemistry (M = 3.54, SD 0.60) scored similarly to traditional general chemistry (M = 3.65, SD = 0.51). There was no statistical significance in terms of grade outcome between the two groups (p = 0.354). The self efficacy assessment, based out of 30 points max, included six statements whereby students ranked their confidence level in each topic using a likert scale from 1 being not confident and 5 being totally confident. A total of 96 students participated, 31 from the modified general chemistry course and 65 from the traditional general chemistry courses. Modified general chemistry (M = 23.71, SD = 3.580) scored higher in self efficacy compared to traditional general chemistry (M = 21.72, SD = 4.021). The results displayed statistical significance (p = 0.021), implying a possible correlation between a modified general chemistry course and improved self efficacy. However, this outcome may have been due to other factors not analyzed in the study.

Communication Sciences and Disorders

27. Maternal Praise, Affirmations, and Directives for Infants with Differing Hearing Status

Presenter(s): Bryan Lin

Advisor(s): Dr. Mary Fagan

In general, maternal directives indicate a mother's attempt to lead her baby away from an activity or object in which he or she may be engaged. Previous research shows that specific types of directives, such as intrusive directives, in mother-infant communications are often negatively correlated with the baby's linguistic and vocabulary development. However, more positive methods such as praise, affirmations, and supportive directives, which are directives made by the mother that aid or strengthen the activity in which the child is engaged, do not show similar correlations. Although use of directives and positive methods varies from mother to mother, we predict that maternal use of directives and praise could be affected by whether or not the child's communication senses are impaired. In our current study, we are interested in understanding possible relations between maternal directive and praise use and the hearing status of 10- to 24-month-old infants; that is, whether infants are hearing typical or have a hearing loss and use cochlear implants. Three different types of maternal directives are used in this study: supportive directives, which are often seen as positive directives that aid the child in their activity; objection directives, in which the mother shows disapproval of a child's behavior; and intrusive directives, where the mother intends to lead the child away from their current activity to focus on a different one. The data

for this study was collected from mother-infant communication recordings during playtime. Although research has been conducted to understand the effect of maternal directives, little research has focused on the impact of parental praise and affirmation. Even less research has been conducted with the inclusion of hard-of-hearing children. Thus, this study aims to understand how maternal directiveness and praise might differ between parents of hearing typical and hard-of-hearing children.

28. Impact of Symbolic Object Use and Language Development

Presenter(s): Leighton Gagnon

Advisor(s): Dr. Mary Fagan

The aim of this study is to evaluate if children are able to demonstrate an object's purpose, and determine if this corresponds with their vocabulary development. Vocabulary development was measured with a child's score on the Communicative Development Inventory. Symbolic interaction is a precursor to language development. A child must demonstrate understanding of the purpose of an object before they name the object. This phenomenon is known as the symbolic interactionism theory. It states that the world is created by meanings that individuals associate to various social interactions, which are passed on through language. Children were presented with a cup, a comb, a car, and a phone. No instructions were given on how to use the objects. Video recordings were coded to document if the child correctly demonstrated use of each object and the number of interactions with the object. Next the child was given two rattles: one that made noise, and one that did not. How many times each rattle was shaken was documented. This study involved children both with and without hearing loss. All children with hearing loss had cochlear implants. Children that demonstrated symbolic object use were expected to have higher vocabulary scores than those who did not. Overall this study would answer the question: Do demonstration of symbolic objects correlate directly with language development as measured by vocabulary knowledge?

Electrical Engineering

29. Preliminary Results for FMCW Radar Implemented With Software

Presenter(s): Andrew Wells, Trey Alexander, Samuel Bernsen, Daniel Dinh, Ethan Slade

Advisor(s): Dr. Maryam Etezadbrojerdi, Dr. Nasim Estahkri

The ultimate objective of our research is to utilize FMCW Radar (Frequency Modulated Continuous Waves) to track and record data on the attentiveness of students in classes. FMCW radar is a technique used for distance measuring using the doppler effect (https://training.ti.com/intro-mmwave-sensing-fmcw-radars-module-1-range-estimation). An antenna sends out a radio wave pulse, or "chirp", that varies in frequency. The chirp is reflected off of the target, and the time-of-flight is used to calculate the distance to the target. Our research is based on Inattentive Driving Behavior Detection Based on Portable FMCW Radar by Ding et al. 2019, where they study the viability of FMCW radar as a monitoring device for drivers attentiveness on the road. Attentiveness in this study is measured based on tracking the movement of the head from the direction of the road. Our research follows a similar methodology, though our primary focus is on student attentiveness. Recording data on students' attentiveness in class could provide critical insights when evaluating teaching methods. While there could be simpler approaches for collecting this data utilizing cameras and computer vision, the usage of cameras to evaluate students in class raises significant privacy concerns. Radar, unlike cameras, would not pose such a concern over privacy. Over the

next month, we will work on our short term goal of using HackRF SDR (Software Defined Radio) devices alongside software (GNU Radio) to create a functional FMCW radar system to transmit and receive signals. This, specifically, is what we intend to present for the symposium.

Environmental Science and Policy

30. ***Food Swamped: Co-location of Environmental Nuisance Properties Decreases Healthy Food Access for Communities of Color***
    Presenter(s): Eva Stanton
    Advisor(s): Dr. Jason Douglas

An estimated 54.4 million Americans live in unhealthy food environments. Food environments are the physical, social, economic, cultural, and political factors that impact the availability, accessibility, and affordability of healthy food within an area. Food deserts and food swamps classify areas with significant food access inequality; food deserts have little to no access to affordable and nutritious food, and food swamps host abundant junk food outlets. Ideal food environments have available, accessible, and affordable food, supporting residents with better health outcomes regarding BMI and obesity. However, food environments differ significantly between communities; lower-income communities with higher proportions of racial and ethnic minorities often are within food deserts and food swamps, whereas wealthier communities with higher proportions of white residents tend to have greater access to healthy food distributors. Such inequalities influence individual and community health, as availability impacts food choices. Drivers of detrimental behaviors like smoking, drinking, and poor diets are influenced by an individual's environment rather than solely personal attributes. In addition, proximity to nuisance properties like tobacco stores, marijuana dispensaries, and liquor outlets affect community health outcomes. And similar to unhealthy food environments, low-income communities with high proportions of people of color are inundated with nuisance properties. Research regarding the co-location of nuisance properties and unhealthy food environments remains uncharacterized. To explore this co-location, we created a GIS snapshot showing the distribution of nuisance properties and food retailers for the City of Los Angeles with communities of different average incomes and ethnic diversity. Such research that supports the conclusion that equitable access to healthy resources improves community health outcomes allows for advocacy and policies that bring about environmental justice within underserved communities.

31. ***Changes in Western U.S. Streamflow Extremes Under Climate Change***
    Presenter(s): Rama Bedri
    Advisor(s): Dr. Thomas Piechota

We are analyzing streamflow extremes in Western U.S. rivers due to climate change. Global warming causes natural disasters to reach extreme points and affects river volumes, snowfall, and precipitation amounts. We analyze the data for the Colorado River basin streamflow stations, whose rivers provide Southern California's drinking water supply. Disruptions in streamflow due to climate change affect the region's water availability and make it difficult to predict future trends. We compared historical streamflow data to eight possible climate scenarios. The different scenarios are Warm Dry, Cool Wet, Average, and Other at emission levels of RCP 4.5 and 8.5. First, we developed codes in RStudio to run the data, convert it to million acre-feet (MAF), and identify the amount of average flow. Next, it subtracts the mean flow from each year's flow value to determine the deficit flow. Then, periods of drought or surplus,

how much flow is associated with each time period, and the length of the period is identified. With the data, we ran t-tests to compare results. Additionally, we created boxplots, bar graphs, and maps of the water stations using ArcGIS to visualize the data. These results help predict future water trends. Based on the historical data, we saw long periods of drought over surplus in recent years. As climate change worsens, we expect to see continuous extreme droughts in dry areas and long periods of surplus in flood areas.

Food Science

32. ***Screening of Salmonella in Raw Ready-to-Eat (RTE) Seafood***
    Presenter(s): Sam Covaia, Grace Marquis, Amanda Tabb, Courtney Kitch
    Advisor(s): Dr. Rosalee Hellberg

Raw ready to eat seafood products from various restaurants were examined and tested for the presence of Salmonella. Fecal and environmental contamination (Escherichia coli and coliforms) were also examined. This examination gave insight on whether or not many common raw RTE seafoods found at local restaurants are safe to consume. This research also clarifies if the safety measures for handling, processing, and transporting seafood is efficient in preventing microbiological hazards. As of now, the presence of Salmonella in seafood is not widely recognized. This is mainly because of the assumption that it will be cooked before consumption, however this is not always the case. The popularity of raw RTE seafood is rising worldwide. Common dishes such as poke, sushi, and ceviche contain raw seafood. In 2018, these dishes were placed in the top 100 hot trends by the National Restaurant Association (NRA 2018). As the intake of raw seafood increases worldwide, agencies such as the FDA need to adapt by changing or adding regulations to ensure seafood products do not contain Salmonella. This study could reveal the need for the FDA to assess their policies and regulations to lower the risk of Salmonella. Not only would this study provide insight for agencies, it could also inform the general public about the concern over raw RTE products.

33. ***Use of DNA Barcoding to Identify Species of Raw, Ready-To-Eat Seafood Products Sold in Orange County, CA***
    Presenter(s): Amanda Tabb, Courtney Kitch, Grace Marquis
    Advisor(s): Dr. Rosalee Hellberg

DNA barcoding is widely used to identify commercial fish species sold in the U.S and internationally. This method is based on DNA sequencing of a standardized region of DNA from a sample. Sequences can then be analyzed against the Barcode of Life Data system (BOLD) for species identification. Additional analysis of samples by a method called DNA mini-barcoding can be used for samples that cannot be correctly identified to the species level by the traditional DNA barcoding method. While relatively high levels of seafood mislabeling have been reported for sushi dishes, few studies have investigated mislabeling of other raw, ready-to-eat (RTE) seafood such as poke and ceviche. The objective of this study was to evaluate the presence of species mislabeling in raw, RTE seafood products in Orange County, CA. DNA barcoding and mini-barcoding were used to investigate 112 samples of sushi, poke, and ceviche collected from various locations in Orange County, CA. All samples underwent DNA barcoding, followed by species identification using the BOLD database. After sequencing, 95 out of the 112 samples passed quality control. The FDA Seafood List was used to identify common and acceptable market names. The results

showed that 25 samples were substituted on the basis of species, and 37 samples did not have an acceptable market name. The overall mislabeling rate for all samples combined was 65.3% (62/95). These results indicate a need for greater scrutiny of labeling practices for raw, RTE seafood sold in Orange County, California.

34. Honey Fraud Investigation by 1H NMR Spectroscopy and Moisture Percentage

Presenter(s): Vanna Kizirian, Mo Hijazi

Advisor(s): Dr. Rosalee Hellberg

This research aims to test clover and wildflower honey sold on the commercial markets in Orange County for the presence of sugar adulterants and possible dilution with water. Honey is a common target of fraud, in which cheaper sugar syrups, such as corn syrup, beet syrup, and rice syrup, are added to replace authentic honey. In addition, honey is sometimes diluted with water, which can lessen the concentration of the natural components associated with the benefits of honey. A total of 30 honey samples were obtained from commercial markets in Orange County, CA. The degrees Brix of the honey was measured by a digital refractometer and converted to moisture percentage to validate it was under 18.6% moisture (the maximum level of moisture that should be present in commercial honey samples according to USDA Standards). Out of the 30 samples, 5 samples had a moisture percentage of 18.6% and above. The samples were tested for the presence of adulterants using 1H NMR (Nuclear Magnetic Resonance) Spectroscopy. To obtain the exact chemical shifts in the NMR spectra, an unadulterated honey sample was used as a reference. Other sugar syrups such as corn syrup, beet syrup, and rice syrup were also obtained for comparison. The number signals in the chemical shifts are proportional to the concentration of the particular compound, which can provide insight into the concentration of possible sugar adulterants and other natural components. Overall, the results of this study will improve our understanding of the extent of honey fraud on the commercial market.

Health Sciences and Kinesiology

35. Assessing the Feasibility of Collecting Ecological Momentary Assessment and Lung Function Data in Adolescents with Asthma

Presenter(s): Dalia Jaafar

Advisor(s): Dr. Brooke Jenkins

Pediatric asthma is one of the most pervasive chronic illnesses, and it presently affects upwards of 6 million children in the United States. While previous research has linked asthma to multiple contributing biological and environmental factors, recent research suggests that psychological and social factors may have an impact on physiological outcomes of asthma like lung function and lung inflammation. Therefore, we designed a study in order to examine the biological, social, and psychological aspects of asthma in children diagnosed with asthma. In the present pilot study, we recruited a total of 66 children with a confirmed asthma diagnosis along with their parents from the Division of Pulmonology at the Children's Hospital of Orange County. Participants were asked to complete an initial baseline assessment as well as ecological momentary assessments four times a day for seven days followed by a final follow up survey. Asthma symptoms and pulmonary function were measured using a 7-item Asthma Control Diary, and peak expiratory flow (PEV) along with forced expiratory volume in one second (FEV1) values were gathered

using data from self-administered spirometer recordings during the ecological momentary assessment portion of the study. The purpose of the pilot study was to demonstrate the feasibility in collecting ecological momentary assessment data in accordance with psychological factors.

36. ***Effects of Mindfulness Practices on Stress Reduction***
    Presenter(s): Leah Auyoung
    Advisor(s): Dr. Manjari Murali

Stress plays a significant role in people's everyday life, impacting mental and physical health. A journal published by the American Psychological Association demonstrated that 44% of adults reported increased stress in the past five years (Clay 2011). This constant and more prevalent exposure to stress negatively impacts allostatic load, the cumulative wear and tear of stress on the body (McEwen B. S. 2005). The current self-study aims to examine the effects of mindfulness on stress reduction. I am the only subject in this study. I compared the effectiveness of two mindfulness courses on stress reduction, Fish Interfaith Center's 6-week Mindfulness Course and the 4-week Koru Basic Mindfulness Course. The Fish course highlights techniques of mindful breathing, non-judgemental thinking, and mindfulness of body and emotion. The Koru course emphasizes mindful breathing, walking meditation, mindfulness of body, thoughts, and emotions, and guided imagery. Three assessments were used in this study to analyze stress reduction: (1) the symptoms of stress assessment analyzes how often one experiences common symptoms of stress; (2) the Perceived Stress Scale (PSS) is used to understand how different situations affect our stress levels; and (3) the Stress Coping Resources Inventory measures how individuals handle stress. All three assessments serve as tools to determine the severity and type of stress the participant is experiencing. The surveys also assessed how current coping strategies for stress work for the individual. All assessments were taken at four-time points, which were before (T1) and after completing the Fish Mindfulness Course (T2), before (T3), and after completing the Koru Mindfulness Course (T4). I hypothesize that while both mindfulness programs will reduce stress levels, the Fish Interfaith Course will be more effective due to the longer program duration, leading to more extended meditation practice.

37. ***Balance and Gait in Typically Developing Children***
    Presenter(s): Kayla Kluemper, Catherine Helgeson
    Advisor(s): Dr. Marybeth Grant-Beuttler

The primary goal of this research is to understand the motor control and development of children with idiopathic toe walking. The lead professor working on this project and our research overseer is Dr. Marybeth Grant-Beuttler. She led in the development of a shoe insert patent called the "Smart Stepper" to help train the children to improve their walking, specifically developing a heel strike gait. To perform the study, children from ages four to fourteen participated in a series of tests and measurements aimed to measure their gait and balance ability. After the first evaluation, the children wore the shoe inserts and continued the same series of assessments three more times in the following months. A specific group of children exhibited limited dorsiflexion measurements, and they were recommended to be casted at Children's Hospital of Orange County. Due to the abundance of data collected from this research, we focused specifically on this group of children and aimed to analyze their measurements from their initial visit to the visits after they were casted. As students, we helped with the data collection in the lab setting of the control children. We also assisted with our other desired learning outcomes such as entering data, observing data collection, coordinating with physical therapists in observation and recruitment, and

anything else that would help see through the completion of the research. We hoped to see improvement in the children's balance and gait measurements after they received the shoe inserts, and we are hopeful that this improves their quality of life.

38. ***Wearable Sensor Assisted Novel Response Time Assessment Tool for On-Field Diagnosis of Concussion***
    Presenter(s): Caitlyn Varsam
    Advisor(s): Dr. Rahul Soangra, Dr. Brent Harper, Michael Shiraishi

As of 2019, it was estimated that there were more than 223,000 hospitalizations relating to concussions/traumatic brain injuries (TBIs) in America. In reality, the number of sports-related concussions is widely underreported, as this number only encompasses hospitalized patients. Approximately 15% of American high school athletes self-reported at least one sports-related concussion within the previous 12 months. Examples of common methods for diagnosis in athletes include reaction time or the sideline assessment. CT scans and MRIs can be quite costly, with the average cost of a head CT scan being $1,390.12 ± $686.13 as of 2015. However, 95% of concussions are not visibly seen through brain imaging, making this method of diagnosis a rarity for those experiencing extreme symptoms. Therefore, new accurate diagnostic tools are needed in order to detect sports-related concussions early, and directly on the field. Reaction times can provide a clinical measure of cognitive function within the brain. The purpose of this experimental study is to determine a concussion status through reaction time. Data collection will occur via a drop test, in which sensors will be affixed on a stick and on the wrist of the patient; the stick will drop at random and the time it takes for the player to catch the stick will be recorded as reaction time. A delayed reaction time may indicate neurological damage, and the possibility of a concussion can be examined.

39. ***Inspiring The Future of STEM, One Project At A Time***
    Presenter(s): Steven Trinh
    Advisor(s): Lauren Dudley

ThinkMED is a nonprofit initiative offering a four-week curriculum specifically designed to develop critical thinking and encourage evidence-based decision making. Each week's content material revolves around the use of a ThinkBOX science kit containing four (4) wet-lab experiments designed to supplement the curriculum. Each experiment is formulated to be inclusive of all California Next Generation Science Standards (NGSS) K-5. At the end of each week, students get the opportunity to speak with university professors & scientists from a multitude of subject areas including chemistry, anatomy, computer science, physiology, and bioengineering. ThinkBOXes are donated to children and families who do not have an environment that is conducive to entering the fields of science, technology, engineering, and math (STEM). ThinkMED and our STEAM Team members seek to create an environment where Thinkers can explore all of the wonders that STEM has to offer on a level playing field without any barriers to learning. Some groups that ThinkMED has had the opportunity to work with are children from low-income families and under-resourced communities in Orange, Tustin, Westminster, Garden Grove, and Santa Ana, children with developmental disabilities, and children affected by a parent's cancer. Ultimately, the goal of ThinkMED is to inspire the future of STEM, one project at a time.

Physical Therapy

40. The Effect of Repeated Fatiguing on Extensor Coordination in Young Adults

Presenter(s): Jonathan Shaw
Advisor(s): Dr. Jo Armour Smith

Introduction: The Sorensen Test is used to compare spinal/hip extensor endurance times and muscle fatigability, and the coordination between extensor muscle groups in individuals with/ without low back pain (LBP). We examined the effects of multiple repetitions (rep) of the Sorensen test on endurance time, muscle fatigue, and extensor coordination. We hypothesized that active young adults with LBP would exhibit less endurance, greater fatigability, and more reliance on hip extensors than back-healthy controls. Subjects: 64 young adults (22.5 +/- 3.4 years), 41 with 1-year histories of recurrent LBP and 23 back-healthy controls. Methods: Surface electromyography (EMG) electrodes were bilaterally placed on the lumbar/thoracic erector spinae (LES, TES), obliques, and hamstrings. Participants performed 3 maximal Sorensen tests with 10-minute breaks between them. Endurance time and fatigability were calculated as duration of hold (DH) and median frequency slope (MFS) for each muscle. Main effects of repetition, group and interaction effects were tested with mixed-model ANOVA. Results: DH decreased across reps for both groups and was significantly less for reps 2 and 3 in those with LBP (mean [standard deviation] LBP2 89.3 [29.0]s, Control2 110. [37.8]s; p=0.019; LBP3 80.2 [25.0]s, Control3 101 [36.9]s; p=0.011). LBP reported after the test was low but greater in the LBP group (p<0.05) for reps 1 and 2, but not rep 3 (p=0.101) (LBP 0.7 [0.7]/10, Control 0.3 [0.6]/10 for rep 2). MFS was significantly more negative for rep 3 than rep 1 for LES (p<0.001), TES (p=0.001), and HS (p<0.001) but there was no main effect of group/interaction nor anything significant for the abdominal muscles. Conclusions: Repeated Sorensen's led to increased spinal/hip extensor fatigue rates, suggesting that participants maintained a holistic strategy across repetitions that didn't fatigue the abdominals. Our results suggest that active young adults with LBP have lower endurance times, but similar muscle fatigability/coordination compared to back-healthy controls.

41. Parkinson's Disease Patients Dual Tasking in Grail Lab at Rinker Health Science Campus

Presenter(s): Amir Memarian, Olivia Johnson
Advisor(s): Dr. Rahul Soangra, Michael Shiraishi

The goal of the experiment is to determine whether dual-tasking (walking/moving) can affect vocal responses and communication in Parkinson's patients. Parkinson's disease occurs due to a depletion of dopaminergic neurons within the substantia nigra pars compacta, which severely reduces cognitive motor functions. Parkinson's patients display reduced language ability and a lack of emotional verbiage, reducing sentence construction, word choice, and overall speech. With the introduction of dual tasks, there was greater stress on cognitive linguistic demand for Parkinson's patients. Fundamental frequency (vibration of the vocal cords) is linked to vocal pitch. Many patients are fixated on response style and are unable to detect variations in delivery, resulting in reduced speech during dual tasks. Although there is qualitative evidence surrounding reduced speech, there are limited quantitative results. Data was collected using an audio headset connected to an android phone, where subject responses for each of the trials were recorded. The questions given were read aloud to the participant audibly and they responded in verbal fashion. Our goal was to observe the differences in language presentation and delivery from the Parkinson's patient in single and dual task activities. During dual task objectives, which consist of answering questions while simultaneously walking on a force plate treadmill, we hypothesize that there

will be a definitive discrepancy in emotional responses and articulation of speech among participants compared to singular task (seated) results. During the seated trials, responses given are predicted to be presented in a greater frequency, a louder voice, and higher quality. Contrary, in walking trials, the participant will give shorter responses with a lower quality, at a lower volume, and a lower frequency.

Political Science

42. Immigrants Who Fear New Immigrants

Presenter(s): Cyril Kobey

Advisor(s): Dr. Ann Gordon

The United States is a country of immigrants, yet somehow nativist fears of immigration have remained constant throughout American history and remain prevalent to this day. In this article, I examine how and why Americans are against welcoming immigrants into our country in 2022. While many people are uneducated about the topic of immigration, research shows that as people learn about the positive effects of immigration, they will come to support it. We can see that people have many differing viewpoints when it comes to immigration, whether based upon the ethnicity, religion, national origin, or basic preconceived biases of immigrants. All these factors contribute to Americans' negative opinions of immigrants. These opinions are often deeply rooted and not easily changed. In this paper, I explore how these opinions can be significantly changed with proper education. Some of the rare instances in which people have changed their opinions on immigration are from information campaigns. Immigration is perceived as something that is negative, despite research showing that it benefits the economy, jobs, and, because birth expectancy is going down in the US, it will help maintain healthy population growth. In reality, there will always be people who oppose immigration, but with the right education people can open their eyes to the positive impacts of immigration and come to support it.

43. Xenophobia, Majority Insecurity, and Prejudice: Exploring the Motivations Behind Anti-Immigration Sentiments

Presenter(s): Serena Park

Advisor(s): Dr. Ann Gordon

In recent years there has been increased concern and conversation regarding immigration to the United States, especially illegal immigration across the United States-Mexico border. As a result, anti-immigration sentiments have been on the rise, with fear of immigrants increasing crime, bringing disease, and decreasing employment opportunities as common justifications. Relying on the Chapman Survey of American Fears, a representative national sample of adults and their fears in the United States, this paper studies what exactly drives this fear of immigrants and immigration—whether it is fear of illegal immigration, white people no longer being the majority, increased crime rates, economic concerns, other reasons, or a combination of any of the above. I expect to find that it is a combination of multiple factors that drives this fear of immigrants and that a sole component cannot be attributed to such a complex question. This research can help explain what drives anti-immigration beliefs and subsequent actions. Especially in light of recent events such as the ones regarding the border wall, police brutality, and hate crimes against the Asian American and Pacific Islander community as a result of COVID-19, these findings regarding anti-immigration may be mirrored in topics concerning race, helping to bring light to what motivates people to harbor enmity to those who differ from them.

44. How Conservative Media Influences Views on Illegal Immigration

Presenter(s): Juhi Doshi

Advisor(s): Dr. Ann Gordon

Conservative media sources tend to amplify anti-immigrant rhetoric on their news shows. In this paper, I examine how conservative media sources may influence how likely one is to fear illegal immigration. Relying on the Chapman Survey of American Fears, a representative national sample of U.S. adults, data is sourced from questions that ask subjects how afraid they are of illegal immigration, where they receive their news from, and what their political affiliation is. The topic of illegal immigration has been studied for years, however, there is not much literature published on how media consumption can directly impact people's fears. Social media and news outlets' coverage of immigrants can connect to public attitudes on immigration policy in the U.S. The framing theory shows that the way an issue is presented to an audience influences the choices people make on how to process that information. The analysis of the survey responses shows that there is a relationship between the fear of illegal immigration and conservative media coverage. My research shows that media outlets an individual chooses to consume will impact their opinion on illegal immigration.

Psychology

45. Validating the Threshold of Conscious Perception

Presenter(s): Cristina Uribe

Advisor(s): Dr. Aaron Schurger

Experimental manipulations of conscious sensory perception ordinarily rely on behavioral metrics that can be used to infer the presence or absence of consciousness. Such metrics imply that there is a threshold intensity above which subjects are conscious of stimuli and below which they are not. Wherever the "true" threshold of conscious perception might lie, any behaviorally-based metric of conscious perception makes a commitment to where to place that threshold. However, no metric has become universally agreed upon. Importantly, placement of this threshold determines how to group the data in experiments aimed at identifying neural correlates of consciousness. Here we argue that if a given purported threshold is a threshold of subjective experience, then there is one test that, at a minimum, this threshold must pass: If identical stimuli are presented at two different levels of intensity that straddle the threshold, then subjects should tend to report that the two stimuli are subjectively different. Furthermore, the probability that both stimuli are reported as different should be lower if both stimuli are below or both are above the putative threshold. Any threshold that does not pass this test, though it might be a threshold of something, is not a threshold of subjective experience. We estimated thresholds using this approach and compared them to thresholds obtained using d-prime, accuracy, meta d-prime, and subjective report. Our data offer a means to test the subjective validity of perceptual thresholds and also provide evidence for an abrupt non-linear threshold of conscious perception.

46. ***The Mediating Role of Child Self Efficacy in Socioeconomic Status and Marital Status affecting Pediatric Asthma Severity***
    Presenter(s): Stephanie Munduruca, Victoria Tang
    Advisor(s): Dr. Brooke Jenkins, Dr. Eric Sternlicht

Asthma is one of the most prevalent chronic diseases in children. Studies have found that children from families with lower parental socioeconomic status (SES) have poor asthma control, leading to greater asthma severity. Children from single-parent households were also found to have greater asthma severity. These associations between family structure and asthma severity may exist through the mediating mechanism of self-efficacy. Specifically, it has been shown that children from families of higher SES and with married parents have higher self-efficacy and self-esteem. In turn, higher self-efficacy in pediatric asthma patients is associated with greater self-management and lower severity. This study will investigate how family structure and SES are associated with children's asthma severity and the mediating role of self-efficacy. Data were obtained from Children's Health Orange County Pulmonary Clinic with pediatric patients with asthma between the ages of 12-17 (N = 47). Parents and children completed a baseline survey where parents self-reported marital status and SES, and children completed subjective measures of self-efficacy. For seven days, four times a day, children measured their asthma severity by recording lung function values, Peak Expiratory Flow (PEF), and Forced Expiratory Volume in the first second (FEV1), using a peak flow meter. These variables were used to perform mediation analysis in SPSS. Mediation analysis found that there were no significant associations found between parental SES and child self-efficacy, and child self-efficacy and child asthma severity for both FEV1 and PEF values. Similarly, no significant associations were found between parental marital status and child self-efficacy, and child self-efficacy and child asthma severity for both FEV1 and PEF values. These results suggest that child self-efficacy may not serve as a mediator in the association between parental SES and child asthma severity and the association between parental marital status and child asthma severity.

47. ***The Impacts of Loneliness and Social Support on the Physical Health and Coping Styles of College Students during COVID-19***
    Presenter(s): Helen (Hee Youn) Lee, Lexxie Lopez, Harshitha Venkatesh
    Advisor(s): Dr. Brooke Jenkins, Dr. Julia Boehm

The COVID-19 pandemic and preventive measures such as social distancing and campus closures have brought unprecedented social isolation to college students. Past studies have suggested that being socially isolated may not only have harmful effects on one's mental health but also result in a variety of physical health problems, such as a weakened cardiovascular system. On the other hand, higher perceived social support can lead to more positive health outcomes as it is associated with lower mortality risk and greater use of active coping strategies. The purpose of the present study was to investigate how loneliness and perceived social support of college students are associated with their physical symptoms and coping styles during the COVID-19 pandemic. The variables were measured through an online survey administered across five different time points in 2020 with students (n = 292) enrolled in Chapman University. Linear regression analyses were conducted to predict the students' physical symptoms and coping styles using their levels of loneliness and perceived social support. The analyses used the first wave of data (from May 2020) to predict the second and fifth waves of the survey, which took place in July and December of 2020, in order to examine how baseline levels at the start of the pandemic predicted changes in the outcome variables at the beginning of the study compared to at the end of the year. Students who showed higher

loneliness at the time of the baseline survey reported greater numbers and higher severity of physical symptoms two months later, b = 2.37, t = 2.89, p < .05. In contrast, students who reported greater perceived social support showed smaller numbers and lower severity of physical symptoms both two (b = -3.35, t = -2.54, p < .05) and seven (b = -3.27, t = -2.23, p < .05) months later. Neither loneliness nor social support significantly predicted the students' coping styles (ps > .05). This study may help inform future interventions to protect the physical and psychological well-being of college students during the global health crisis.

48. ***The Associations of Racism-Related Stressors to Well-Being Among Asian Americans during the COVID-19 Pandemic.***
    Presenter(s): Christine Chang
    Advisor(s): Dr. David Frederick

Discrimination and prejudice against Asian Americans have increased dramatically during the COVID-19 pandemic. Reports of anti-Asian hate crimes increased by 164% in 16 of America's largest cities. Labeled as the model minority, discrimination towards Asian Americans has often been subtle over the past several decades, most commonly seen through microaggressions. However, as COVID-19 became nicknamed the "Chinese Virus," the tying of the virus to Asian Americans led to greater expression of anti-Asian rhetoric in the media. Asian Americans reported greater incidences of being excluded, feeling unwelcomed, being told to "go back to their country," and being physically threatened due to the perceived connections between their ethnicity and COVID-19. Experiencing greater racism during the pandemic placed Asian Americans at a heightened risk for adverse mental health outcomes. The Asian American Attitudes Study surveyed 305 Asian American adults about their experiences with racism-related stressors and their overall well-being. Asian Americans who experienced high levels of vicarious racism, perceiving other people in their same ethnic/racial group being discriminated against during the COVID-19 pandemic, reported significantly higher levels of depression and anxiety. The present study also found that Asian Americans who had higher acculturation to Western society reported higher levels of depression and Asian Americans who reported higher levels of social support had lower levels of depression and anxiety. COVID-19 was a time when many minority groups were at a heightened risk for adverse mental health outcomes. As the pandemic continues, these findings emphasize the need for additional research on interventions that are specifically catered to Asian Americans and the unique factors that contribute to their mental health.

49. ***Parental Involvement and Child's Educational Goals: Longitudinal Findings from the 1958 National Child Development Study***
    Presenter(s): Jolie Binstock, Tanshi Mohan
    Advisor(s): Dr. Julia Boehm

Research suggests that parental involvement in a child's education is correlated with positive educational outcomes for the child, such as higher subject literacy and grade-point averages (Boonk et al., 2018; Fan & Chen, 2001). The purpose of this study was to determine if a relationship was present between parental involvement and children's post-high school plans regarding continuing education and career goals. Data came from children and their parents in the 1958 National Child Development Study, which collected information from 17,415 babies born in Britain, Scotland, and Wales across their lifetime. Parental involvement was assessed using teacher ratings from a survey in 1969 when the children were eleven

years old. Child outcomes regarding their plans and career goals after high school were evaluated in 1974 when they were sixteen years old. We hypothesized that higher ratings of parental involvement in 1969 would correlate with more ambitious educational goals reported by children in 1974. Chi square analyses and corresponding effect sizes will be used to evaluate this hypothesis.

50. Physical Activity as a COVID-Stress Moderator?

Presenter(s): Lauren Anderson

Advisor(s): Dr. Tara Gruenewald

Exercise can play a critical role in helping individuals adapt to stress given its known links with mental and physical well-being. Anxiety and depression affect millions of Americans and the prevalence of these conditions increased during the worldwide COVID-19 pandemic. Past research has indicated that there is an association between higher physical activity and decreased depression and anxiety symptoms. In the present study, we examined whether exercise frequency was linked to levels of depression and anxiety, and whether exercise frequency moderated hypothesized associations between greater negative impacts of the pandemic and greater levels of depression and anxiety, during the COVID-19 pandemic. Data came from the Coping with COVID-19 Study, a sample of 1,728 participants (51.7% female, ages 18-65+) from across the U.S. who were invited to participate in five waves of a longitudinal survey study. COVID-19 stress was evaluated as the average of seven negative impacts (e.g., loss of job-related income) of the pandemic. Exercise frequency was coded as days per month of moderate and vigorous exercise engagement. Symptoms of anxiety and depression were measured by the Generalized Anxiety Disorder-7 Scale and Patient Health Questionnaire-9, respectively. Analyses of the baseline survey (April 2020) indicate that greater negative COVID impacts predicted higher levels of depression (β = .45***) and anxiety (β = .53***), and greater vigorous exercise frequency predicted lower levels of depression (β = -.10***), but were unrelated to levels of anxiety in regression models with age and sex covariates. Moderate exercise frequency was not linked to mental well-being, nor did exercise interact with COVID impacts to predict levels of depression and anxiety. Ongoing analyses are exploring whether these patterns of association hold in later stages of the pandemic. Initial findings indicate a negative association between greater exercise frequency and depression but no evidence of a buffering role for exercise in links between COVID stressors and mental well-being.

51. Novel Conspiracy Beliefs and Social Exclusion

Presenter(s): Natalie Standridge

Advisor(s): Dr. Tara Gruenewald

Conspiracy theories are beliefs that provide an explanation for a situation by blaming a group of individuals for scheming to achieve a malevolent goal. Conspiratorial beliefs have been found to be associated with lower physical and psychological well-being; as such, it is important to identify factors that increase conspiracy theory endorsement. These beliefs are often hypothesized to arise from the presence of an existential threat as conspiracy theories can provide an explanatory structure for external stressors. Meaning-making fueled attraction to conspiracy beliefs are especially likely to in the presence of an antagonistic outgroup. Social exclusion is a form of existential threat that has been shown to increase conspiracy theory endorsement, but many studies assessing vulnerability to conspiratorial thinking in the context of social exclusion have assessed adherence to preexisting conspiracy beliefs as compared to demonstrating vulnerability to new conspiratorial ideologies. The goal of the current study is to examine

whether the experience of social exclusion can increase the likelihood of endorsement of a novel conspiracy theory and increase outgroup antagonism. Exposure to social exclusion was manipulated through an online game, Cyberball, in an experiment conducted on the Amazon Mechanical Turk platform. Following the presence or absence of social exclusion during the online game, participants were then asked to complete a measure assessing tendency to endorse a novel set of conspiracy theories regarding energy drinks, and additional measures of endorsement of false, novel, and true conspiracy theories. Outgroup antagonism was assessed by having participants rate ideologically inconsistent political figures on a series of adjectives. It is predicted that social exclusion will increase vulnerability to endorsement of both novel and known conspiracy beliefs, and promote outgroup antagonism. Study findings will contribute to our understanding of whether social exclusion influences vulnerability to conspiratorial thinking and outgroup antagonism.

52. COVID-19 Conspiracy Beliefs and their Association with Psychological and Social Well-Being

Presenter(s): Natalie Standridge, Clarissa Tadros

Advisor(s): Dr. Tara Gruenewald

Conspiracy theories are beliefs that a group of individuals is attempting to achieve sinister goals in secret. These beliefs usually result from fear and existential threat and are associated with decreased psychological and physical well-being. The COVID-19 pandemic has been a significant national stressor and COVID-19 conspiracy beliefs have grown in popularity. Our previous research indicated that greater COVID conspiracy beliefs predicted lower frequency of engagement in COVID prevention behaviors and lower vaccine receptivity. In the current study we examine the psychological and social well-being correlates of these beliefs. Data comes from a sample of 1,728 U.S. adults who completed four online surveys over approximately one-year (April 2020-April 2021) to assess COVID-19 experiences and psychosocial and physical well-being. COVID-19 conspiracy beliefs were measured at waves two and four and well-being and psychosocial well-being (perceived stress, depression, social well-being) at every wave. Greater belief in COVID-19 conspiracy theories predicted lower levels of social well-being (wave 2 β=-.13, p<.001), greater levels of perceived stress (wave 2 β=.10,p<.001; wave 4 β =.11,p<.001), and greater levels of depressive (wave 2 β=.15, p<.001; wave 4 β =.11, p<.001) and anxious symptomatology (wave 2 β=.14, p<.001; wave 4 β =.11, p<.001), in regression models including age, sex, race, and education covariates. Each one unit increase in greater endorsement of COVID conspiracies was associated with 1.6 greater odds of a respondent reporting severe depression and a 1.4 greater odds of reporting severe anxiety. These findings indicate that greater endorsement of COVID conspiracy theories is linked to poor psychological and social well-being, although the causal direction of these linkages is unclear and an important target of experimental research. Given observed associations between COVID-19 conspiracy beliefs and lower psychosocial well-being, these beliefs appear to be important targets for interventions to promote psychological and social well-being.

53. Intervention to Modify Perceptions of Homelessness

Presenter(s): Sophie Srivastava

Advisor(s): Dr. Vincent Berardi, Dr. David Frederick

As public opinion is known to impact policy formation, assessing how the public misperceives the homeless population is important to prevent non-informed policies from being adopted. This study focused on correcting misperceptions about the homeless as a means to garner support for public policies

that are known to improve the lives of homeless individuals and those with mental illness. The research study implemented two forms of virtual interventions (refutation texts and personal anecdotes from homeless individuals) plus a control and assessed support for various policies before and after the trial. The goal of the study was to determine which intervention modality most effectively corrects misperceptions, reduces stigmatized attitudes, and influences support for effective policy solutions. Participants recruited via Amazon Mechanical Turk in California (N = 319) were randomly assigned to either the control group or one of the two intervention groups. A regression model was used to compare the means between the intervention and control groups and determine if the intervention had a significant effect on participant opinions and demographic ratings. I hypothesized that misperceptions regarding homelessness causes would be positively associated with support for ineffective policies. I also hypothesized that participant demographics would play a role in opinions, with conservative participants and older participants believing in more stigmatized causes. In terms of the interventions, I hypothesized that the anecdotes will be more effective than the refutation texts in promoting sympathy and humanizing the homeless in the eyes of the participants due to the effectiveness of interventions that utilized the contact hypothesis. Conversely, I hypothesized that the refutation text intervention, rather than the anecdotes, would result in more accurate perceptions of causes, more support for known effective policies, and more accurate estimates of the demographic breakdown.

Religious Studies

54. Folklore, Fins, and Feminism: Gender Themes in Mermaid Mythology

Presenter(s): Megan Leach

Advisor(s): Dr. Julye Bidmead

Considering that water covers seventy-one percent of Earth's surface connecting cultures from around the globe, it is unsurprising that mermaid mythology is ubiquitous, influencing the folklore and culture of different ethnic groups and societies around the world dating back to 2900-2334 BCE Mesopotamia, the cradle of civilization. The image of mermaids varies by culture, yet she is present as a symbol of femininity, female empowerment, sexuality, independence, and fearsome female forces beyond the control of patriarchy. Mermaids symbolize freedom, emotionality, and escapism for women throughout history in mythology, literature, art, and media, captivating cultures to the present day. I am examining the history of the mermaid figure in world mythologies, exploring the mermaid character archetype, the depiction of the female body as mermaid on screen, female sexuality, and opposing the male gaze. The popularity of the mermaid figure is apparent in Hollywood film history with ebbs and flows of mermaid content which appeared to resurface at socio-historically significant moments during both periods of rigid, enforced gender roles, like the 1800's and 1950's and progress for gender equality of the 1980's in Western cultures. My research comparing elements of gender and sexuality in mermaid mythology from around is the foundation for my television pilot about 1950's America which reflects multiple mermaid mythologies. My poster presentation will consist of my vision for the series and historical evidence of mermaids as feminist figures in world cultures.

55. The Practicality of Omens in Ancient Mesopotamia

Presenter(s): Jennifer Carpenter

Advisor(s): Dr. Julye Bidmead

Whilst learning about omens and their significance in Mesopotamian spiritually and the influence they had over peoples day to day lives during that period of time it rose some interesting questions. The most important of which is my hypothesis that some Omens were not just based on religion but also could be assisting with the health and ultimately survival of the population. Omens were a very significant part of Mesopotamian life and many decisions were based off of their beliefs in these omens. For example, any skin diseases were seen as a bad Omen and therefore a stigma was created around skin impurities. We've seen this in other religions like the rules of Kosher in Judaism and the reasoning behind them being both spiritual and practical to protect the people within the religion or like in Mormonism when those who practice refrain from drinking alcohol and caffeine both of which have negative health effects when consumed too often. I find it hard to believe that the reason for all of Mesopotamian Omens lies in truly just spirituality and not practicality at all and in my research I will attempt to look over these omens and compare them with modern counterparts and see if they help at all with the peoples well being and survival rates.

World Languages and Cultures

56. Impact of French History on Medical Advancements

Presenter(s): Megan Roy

Advisor(s): Dr. John Boitano

Medicine is an industry best known for being ever-changing and, because of this, medical education is something that undergoes constant refinement and growth to align with the current standard. The education that physicians underwent in the 17th century is nearly unrecognizable when compared to today's methods of educating our future healthcare professionals, however many of these modern-day methods can be attributed to the advancements made by older countries. This research project seeks to explain how French contributions to medical education over the last 300 years has altered the way physicians and other health officials are educated globally today. Knowledge of this topic, though broad, has not yet been culminated into a comprehensive project that clearly illustrates via a historic timeline how medical education was shaped by French political, social, and economic movements. Over 25 peer-reviewed sources were identified and consulted to determine whether there was corroborating evidence that French contributions to the way health professionals were educated had a lasting impact. It resulted that several large advancements such as the popularization of cadaver use in medical schools, integration of faculties and students into new research-oriented hospital systems, and requirements for practice like licenses and board exams influenced medical education in a way that is still visible today. France was not the only country to make significant medical improvements throughout history, however their notable achievements have revolutionized medicine now and for years to come.

57. ***How French Films Explore and Influence French Culture as Relating to the "Other" and the Immigration of Other Cultures in France***
    Presenter(s): Madeleine Smith
    Advisor(s): Dr. John Boitano

French Films, as a way of exploring French Culture, hold vital information about how the French approach, understand, and interact with other cultures and the idea of "other," as it pertains to preserving one's culture with the effects of globalization and immigration today. Previous studies have relied on reported quantitative data about films, immigration statistics, and opinion surveys. Le Centre national du cinéma et de l'image animée (CNC) surveyed the films being played in French movie theaters and found that throughout the last decade nearly or more than half of the films shown have been American films. We use articles, studies, and films to discern what aspects of French culture have been reinforced throughout recent history and to understand how the idea of "other" in films, whether that be culture, nationality, or language has impacted the acceptance of immigrants. While the acceptance of immigration and cultural sharing or mixing is a debated topic both amongst the French and in French Politics, this research looks to explore the reinforced images and language used to discuss the "other," as films are a powerful tool in cultural development. The French have stereotyped and portrayed other cultures as distant from their own, and in turn have created a power differential where French culture is seen as superior to the other cultures in France, which has impacted citizens' views on the immigration practices of their country.

58. ***Julie d'Aubigny: a Life Lived for Love / Julie d'Aubigny: une Vie Vécue pour l'Amour***
    Presenter(s): Van Baumann
    Advisor(s): Dr. John Boitano

Queer historical figures affirm and bring to light the lives of those often written out of history. Julie d'Aubigny was a duelist and opera singer in 17th century France, and importantly a notorious bisexual in the Parisian city scene. Historical representation of queer individuals is essential to establish a world that understands and accepts the community. This essay works to discuss the life and legacy of Julie d'Aubigny, and the importance of her documentation as a woman who engaged in public with other women romantically. Her life survives on in letters, opera reviews, and press stories from the time period. The accounts of the life of Julie d'Aubigny allow for modern analysis of how sexuality intertwined with historical societies and hierarchies, especially revolving around how nobility affected perception of sexuality. The persistence of her existence throughout history proves that although barriers to acceptance of the queer community have often included erasing aspects of biographical historical accounts, the existence of queer people will continue on regardless.

AF 209A

Biochemistry and Molecular Biology

11:30am-11:50am
Using Absorbance and Fluorescence to Measure Chlorogenic Acid Esterase Activity
Presenter(s): Kellie Omori
Advisor(s): Dr. Cedric Owens
Chlorogenic acid (CGA) is an antioxidant that is present in large concentrations in many foods. CGA esterases are useful enzymes that hydrolyze CGA into caffeic and quinic acid. Our goal is to use protein engineering to make a highly active CGA esterase for food science and industrial applications. To do this, we identify regions on CGA esterase that are the most flexible and then target these residues for mutagenesis to develop engineered enzymes with higher turnover rate than the wild-type. Because this approach involves creating a rather large number of mutant esterases (>100), it requires a high-throughput activity assay that can quickly screen the activity of many mutants. We present a newly developed absorbance and fluorescence assay that distinguishes CGA from caffeic acid. CGA and caffeic acid are both fluorophores due to the aromatic rings in their structures, but they each absorb light and fluoresce at different wavelengths. Their distinct absorbance and fluorescence properties allow us to characterize the CGA hydrolysis reaction and measure enzyme activity by monitoring CGA depletion and caffeic acid formation. Highly active esterases produce a shift in peak maxima of the signals, indicating CGA breakdown is occurring. The reliability of this screening method was validated by adding wild-type CGA esterases in a reaction with CGA. As expected, we observed a shift in signals on the excitation and emission spectra. We then used this assay to screen the activity of our first mutant (Q202). These experiments demonstrate the functionality and efficiency of the rapid screen, allowing us to perform mutagenesis on the remaining target residues.

Chemistry

11:50am-12:10pm
Excited Electron Chemistry on Bimetallic Tintantium Nitride Plasmonic Core-Shell Nanoparticles
Presenter(s): Chelsey Cortes
Advisor(s): Dr. Jerry LaRue
Catalysts are integral to many chemical reactions as they reduce energy consumption and minimize pollution. Modern catalysts, however, are not selective nor efficient enough to satisfy some of today's global challenges and, in some cases, can even lead to an increase in pollution. The Petroleum industry, for instance, is one of the most significant contributors of carbon monoxide pollution and hydrocarbon emissions attributable to the incomplete combustion of petroleum. By coating plasmonic titanium nitride nanoparticles with an active transition metal, we aim to create highly selective and active plasmonic photocatalysts. These promising novel catalysts can potentially be utilized to carry out excited state chemistry reactions and may be used to mitigate carbon monoxide pollution in an environmentally friendly and cost-effective manner. This works because when the plasmonic metal core is excited by light and its plasmon resonances decay, it creates highly energetic "hot" electrons that can promote excited state reactions, while the transition metal shell functions to enhance the selectivity and efficiency of the

reaction. This project aims to understand how the geometry and electronic structure of photocatalytic surfaces can be tuned to allow for the conversion of carbon monoxide into carbon dioxide or methanol. We have synthesized and characterized titanium nitride core nanoparticles with a transition metal, ruthenium or rhodium, shell and will be studying the photocatalytic efficiency of the core-shell nanoparticles through hydrocarbon and oxidation reactions. These bimetallic core-shell nanoparticles lay the foundation for the next generation of green photocatalysts.

12:10pm-12:30pm
Counterions effects in calcium-mediated sulfur-fluorine exchange
Presenter(s): Michael Bertagna
Advisor(s): Dr. O. Maduka Ogba
Calcium ions, bound to weakly coordinating anions (e.g., bistriflimide or triflate ions), have gained significant utility within the last two decades as catalysts for facilitating challenging chemical reactions. This is particularly exciting because calcium, unlike the transition metals typically used as catalysts, is cheap, abundant, and non-toxic. Despite these obvious advantages, calcium catalysis is in its infancy - little is known about the mode in which calcium salts activate substrates in chemical reactions. Recent experimental work has shown that calcium bistriflimide salts activate sulfur(VI) fluorides in a sulfur(VI)-fluorine exchange (SuFEx) toward nitrogen-containing sulfur(VI) compounds of medicinal relevance. A closer look at the experimental data show that switching the anion from bistriflimide to triflate results in dramatic yield losses, indicating that the counterion plays a crucial role in facilitating the chemical process, beyond being weakly coordinating. In this work, density functional theory methods were used to compute and compare the SuFEx mechanism mediated by calcium triflate to that mediated by calcium bistriflimide. Structural, energetic, and electronic insights from computations that explain the origins of the counterion-induced reactivity differences between calcium bistriflimide and calcium triflate will be presented.

AF 209B

Communication Studies

11:30am-11:50am
Dating Apps, Communication, and Consent
Presenter(s): Catherine Mysliwiec, Fiona Burrows, Rocky Wetzler, Malak Abulohoum
Advisor(s): Dr. Austin Lee
Dating apps have transformed the way people develop sexual and/or romantic relationships over the past decade. Furthermore, the COVID 19 pandemic has pushed communication further online increasing distance and asynchronicity of what used to be face-to-face interactions. American college students frequently use dating apps for casual sexual relationships, romantic relationships, friends, and more. We are interested in exploring how difficult topics such as consent and boundaries are discussed on the app, prior to the meeting, and/or during the initial meet-up. The increasing popularity of dating apps among college students may effect behaviors and attitudes of consent, and thus this is a worthwhile and timely subject for research study.

Political Science

11:50am-12:10pm
No Idols: China's Qinglang Movement and K-pop
Presenter(s): Claudia Sheng
Advisor(s): Dr. Minju Kwon
With the accelerated expansion of the South Korean entertainment industry in the 2010s, K-pop has made its mark on entertainment industries and locals all over the world, including in China. However, under the conservative rule of the CCP, the Chinese government has recently put stricter regulations on K-pop and idol culture through the revival of the Qinglang Movement. Existing studies have focused broadly on the Chinese government's policies regarding local media, but few have accounted for the Chinese government's recent regulations of K-pop and idol culture. This paper examines how and why the Chinese government has regulated the transnational culture of K-pop by focusing on three phases: (1) the realization of K-pop's potential influence on politics (2015-2016), (2) the implementation of Korean entertainment bans (2016-2019), and (3) the resurgence of the Qinglang Movement to regulate online idol fandom activity (2021). I find that the Chinese government's reasoning behind stricter censorship of K-pop is to promote president Xi Jinping's dedication to the original Maoist communist agenda as means of preventing corruption of the Chinese youth with transnational popular culture and social media. I also find that these regulations are heavily influenced by China's traditional and conservative political and social culture, and the government's motivation to maintain harmony in Chinese society. This research will contribute to the literature on culture and politics in East Asia by examining the Xi administration's actions and reactions to K-pop and its influences.

12:10pm-12:30pm

Joke or Accountability: Duterte's Misogynistic Speeches and Local News Media

Presenter(s): Kaye Valdez
Advisor(s): Dr. Minju Kwon

President Rodrigo Duterte's misogynistic speeches have faced strong criticisms from the international and domestic communities, but he remains widely popular in the Philippines. Existing literature has discussed Duterte's strategic use of such speeches (Kaul 2021; Parmanand 2020) or women's responses to his misogynistic stance (Gregorio 2020). However, few studies have examined how local media play a role in constructing the information relevant to Duterte's misogynistic behavior. This paper analyzes how the top five local news media have framed Duterte's misogynistic language with a focus on two incidents: (1) his lewd threat to female communist soldiers in February 2018 and (2) his comment on women being unfit for presidency in January 2021. We find that local media tend to omit specific information on his speeches and lower the tone of the speeches despite varying bias levels across the media. Even critics of the government do not pay particular attention to his misogynistic language and attitude, but they rather emphasize his other problematic actions unrelated to women. We argue that the underlying ambivalent sexism in society and the media's ignorance of sexism normalize the ongoing misogynistic behavior by politicians in the Philippines that has ironically ranked high for gender equality (#17 in the 2021 Global Gender Gap Report). This research contributes to feminist media studies by providing insights from a new empirical case study from the Philippines.

AF 209C

Psychology

11:30am-11:50am

Forms of Physical Activity and their Correlation with Women's Body Image and Eating Behaviors

Presenter(s): Hannah Burness

Advisor(s): Dr. Desiree Crevecoeur-MacPhail, Dr. Tara Gruenewald

This study was conducted to explore the correlations between body image and disordered eating with anaerobic and aerobic exercise. According to the sociocultural theory of body image, women develop bad body image when they internalize society's obsession with thinness and their body does not live up to this ideal. However, despite current sociocultural norms, positive body image is still achievable after women go through a process of empowerment or reflection (Paquette & Raine, 2004) This study proposed that weightlifting, or anaerobic exercise, can serve as the process of empowerment necessary for women to overcome the internalization of sociocultural norms surrounding women's bodies. Participants included women over the age of 18, and they were recruited via social media ads. After consenting to participating, participants completed The Recent Physical Activity Questionnaire, or RPAQ, Eating Disorder Examination Questionnaire, or EDE-Q, and answered demographic questions. Results are expected to indicate a positive correlation between higher body image and higher frequency of anaerobic exercise. Furthermore, results are expected to indicate a positive correlation between high frequency of aerobic exercise and disordered eating behaviors, with disorder eating moderating the association between frequency of aerobic exercise and bad body image. If significant, these results suggest that weight training can be used to improve body image and disordered eating behaviors. Society must shift the narrative of the importance of women participating in aerobic exercise to include the importance of women participating in anaerobic exercise for the betterment of women's physical and mental health.

11:50am-12:10pm

Sexual Behavior, Satisfaction, and Wellbeing

Presenter(s): Julia Wolfe

Advisor(s): Dr. Tara Gruenewald, Dr. Desiree Crevecoeur-MacPhail

Bondage & Discipline, Dominance & Submission, Sadism & Masochism (BDSM) is a large part of the queer community that is often overlooked and heavily stigmatized. The BDSM community tends to be shrouded in judgment and doesn't receive the same amount of research as other queer communities and spaces. This study assessed if attitudes toward, and the practice of BDSM, is associated with psychological well being. Prior research suggests that individuals who participated in BDSM indicated higher levels of sexual satisfaction than their vanilla, individuals who don't participate in kink/BDSM, counterparts (Strizzi et al., 2021). Results from a study conducted by Cascalheira et al. (2021) suggest that most participants used kink related activities to reframe and heal from early trauma. Other research has found that the baseline pain threshold increases in the context of a BDSM scene (Wuyts et al., 2021). Additional research into the relationship between BDSM and psychological well-being found that practicing BDSM is associated with reduced psychological stress and negative affect (Ambler et al., 2016). This study used the Sadomasochism Checklist to measure sadomasochistic practices in the sample, the new sexual satisfaction scale, the psychological wellbeing scale, the trauma symptom

checklist, and the pain sensitivity questionnaire. The expected results of this study include a positive correlation between sadomasochistic practices and psychological wellbeing, pain tolerance, and sexual satisfaction as well as a negative correlation between sadomasochistic practices and trauma symptoms. Implications of this research include destigmatizing the BDSM community and shining a light on the positive aspects of BDSM, kink, and sadomasochistic practices including its benefits in relation to psychological well-being.

12:10pm-12:30pm

Changes in Drug Use in College Students during the COVID-19 Pandemic

Presenter(s): Brittany Katcha

Advisor(s): Dr. Tara Gruenewald, Dr. Desiree Crevecoeur-MacPhail

This study examines how the COVID-19 pandemic affected college student alcohol and drug use and the factors associated with these changes. Much research has been done on how the pandemic increased drug use in the general population (Czeisler et al., 2020) and affected adolescents' usage (Miech et al., 2021), but there is a lack of research about how the pandemic affected the drug use of young adults, which is a time usually associated with drug experimentation. Young adults who were college students at the start of the COVID-19 pandemic took an online survey where they were asked questions about their drug use, loneliness, depression, and housing situation during 2020. Results are expected to show an increase in drug use for most young adults, with the exception of students who had to move back into their family home due to the pandemic, who are expected to have decreased their usage. Additionally, drug use will most likely correlate with loneliness and depression, and risk of relapse is predicted to increase for college students who already struggled with substance use disorder prior to 2020. These results would demonstrate the impact that social isolation has on depression and substance use in college students and contribute meaningful knowledge to discussions surrounding mental health and substance abuse services provided by colleges and universities. References: Czeisler, M. É., Lane, R. I., Petrosky, E., Wiley, J. F., Christensen, A., Njai, R., Weaver, M. D., Robbins, R., Facer-Childs, E. R., Barger, L. K., Czeisler, C. A., Howard, M. E., & Rajaratnam, S. (2020). Mental health, substance use, and suicidal ideation during the COVID-19 pandemic - United States[CMD1] , June 24-30, 2020. MMWR. Morbidity and mortality weekly report, 69(32), 1049–1057. https://doi.org/10.15585/mmwr.mm6932a1 Miech, R., Patrick, M. E., Keyes, K., O'Malley, P. M., & Johnston, L. (2021). Adolescent drug use before and during U.S. national COVID-19 social distancing policies. Drug and Alcohol Dependence, 226, 108822. https://doi.org/10.1016/j.drugalcdep.2021.108822

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