

STUDENT SCHOLAR SYMPOSIUM

SPRING SESSION

May 7 - 8, 2025

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Welcome to the Spring 2025 Chapman University Student Scholar Symposium!

This symposium serves as a distinguished showcase for undergraduate excellence. The students' poster and oral presentations represent the culmination of innovative research and creative endeavors undertaken by our students. Our student scholars embody the diversity of academic and artistic disciplines that thrive within the Chapman community and reflect the university's commitment to fostering a culture of discovery, collaboration, and expression. We invite you to join us on May 7th and 8th to explore the wide array of outstanding presentations and honor the remarkable achievements of these students. We encourage you to engage with our scholars and their work, ask questions that spur curiosity, offer comments that inspire innovation, and connect in meaningful ways that will continue to cultivate our intellectual community.

The Student Scholar Symposium is proudly sponsored by the Center for Undergraduate Excellence (CUE), Chapman's central hub for supporting and amplifying student achievement. CUE offers resources and opportunities that facilitate research and creative endeavors across campus to help foster a vibrant academic community that helps undergraduates flourish. This event would not have been possible without the exceptional efforts of the CUE team. We extend our sincere appreciation to Operations Manager, Lisa Kendrick, and Graduate Assistants, Lauren Sieber and Wilson Chae, for their outstanding leadership in planning and executing this symposium. We are also grateful to our student presenters, faculty mentors, faculty moderators, and staff volunteers for their invaluable contributions.

Thank you for joining us in celebrating the scholarly achievements of our students. We hope you enjoy the Symposium!

Dr. John Hunter

Director of the Center for Undergraduate Excellence

Acknowledgements and Schedule

The Center for Undergraduate Excellence gratefully acknowledges the following individuals for their support:

Oral Presentation Moderators:

Dr. Desiree Crevecoeur- MacPhail
Dr. Ana Palomar
Dr. John Hunter

Dr. Ronald Steiner
Dr. Hagop Atamian

Staff Volunteers:

Jackie Coyne
Mary deVlugt
Erika Orejola
Amy Aldana

Presentation Schedule

Wednesday, May 7

Poster Session 1	Sandhu Conference Center	9:30 – 11:00 AM
Poster Session 2	Sandhu Conference Center	12:30 – 2:00 PM

Thursday, May 8

Oral Session 1	Argyros Forum 209	10:00 - 11:00 PM
Oral Session 2	Argyros Forum 209	11:30 – 12:30 PM
Oral Session 3	Argyros Forum 209	1:00 – 2:00 PM

Biochemistry and Molecular Biology**1. Shear-Induced Structural Organization in Ultra-Low Crosslinked Microgel Pastes****Presenter(s):** Daniel Mattar, Elif Narbay**Advisor(s):** Dr. Andrew Lyon

This study investigates how mechanical manipulation affects collagen fiber orientation when embedded within ultra-low crosslinked (ULC) microgel pastes at varying concentrations (1, 50, and 100 mg/mL). ULC microgels, characterized by their soft, deformable structure and tunable pore-to-particle ratios, were used as a matrix material to understand confined environment effects on fibrillar protein organization. Paste samples with incorporated collagen were subjected to different shear conditions (fast versus slow drawing across microscope slides) to simulate varying mechanical stress environments. Collagen fiber alignment was quantified using Fast Fourier Transform (FFT) analysis, revealing distinctive orientation patterns dependent on both paste concentration and application method. Results demonstrate that mechanical manipulation slightly influenced collagen fiber alignment, with faster drawing speeds producing more pronounced directional orientation particularly at higher paste concentrations (100 mg/mL). The 50 mg/mL concentration exhibited moderate alignment response, while the dilute 1 mg/mL samples showed minimal directional organization regardless of application method and was used as a control group. These findings provide valuable insights into how confined environments affect protein structural organization under mechanical stress, with potential applications in developing biomimetic materials for tissue engineering, wound healing technologies, and platelet-like hemostatic particles that require specific mechanical behaviors in confined biological environments.

2. Investigating the Bulk Properties and Flow Behaviors of pNIPAm Microgel Pastes Using Polystyrene Particle Fluorescent Probes**Presenter(s):** Joshua Abuyog, Hatte Hamilton, Elif Narbay**Advisor(s):** Dr. Andrew Lyon

Researchers often implement fluorescent probes to analyze various biochemical structures, material properties, and molecular interactions at a microscopic level. Incorporating these existing visualization techniques, this project aimed to enhance the understanding of the micro-rheological properties of ultra-soft microgels made using poly(N-isopropyl acrylamide) (pNIPAm). More specifically, these experiments investigated the microgel's bulk properties, namely viscosity and stiffness, by incorporating fluorescently labeled polystyrene (PS) core particles into varying microgel paste concentrations. Thus, analysis of PS particle movement in these differing environments generated both qualitative and quantitative data on the local microgel environment within these samples to explain their bulk properties. To further investigate the microgel's behaviors, subsequent experiments were conducted in which PS core particles were functionalized with 4-aminobenzophenone to visualize the interactions between samples that more closely resembled each other. In other words, functionalized PS core particles were

photocrosslinked with microgels and analyzed using both fluorescent and confocal microscopy to more precisely determine how these fluorescent probes behaved in these microgel environments. Future steps for this experiment include attempting these investigative assays under varying photocrosslinking and microgel concentration conditions and identifying the changes in the behaviors of these experimental samples. Through these investigations, insight into the flow dynamics and bulk properties of pNIPAm microgels can be better understood to enhance their applications in various biomaterial or bioengineering fields.

3. Analysis of the Role of Arginine Methylation and Its Link to Dilated Cardiomyopathy

Presenter(s): Joyce Yun

Advisor(s): Dr. Cecilia Zurita-Lopez

Post-translational modifications play a critical role in the regulation of protein function, stability, and interactions. In this study, we focused on one of these modifications, arginine methylation, in B-cell lymphoma 2-associated athanogene 3 (BAG3). BAG3 is a 575-amino acid co-chaperone involved in the quality control of proteins and cellular stress response and is essential in maintaining proteostasis, particularly in cardiac and skeletal muscle. Mutations in BAG3 have been linked to dilated cardiomyopathy (DCM). Using computational analysis, methylation sites on BAG3 were predicted and identified, leading to the need for experimental validation to determine whether these modifications influence BAG3 function. In order to accomplish this, in vitro methylation assays with protein arginine methyltransferase 1 (PRMT1), followed by glutaminase-C digestion and Quadrupole Time-of-Flight (QTOF) Mass Spectrometry, we identified methylation at arginine residues 294 and 343. These sites may have an impact on BAG3's chaperone activity. As a result, we hypothesize that atypical methylation may hinder BAG3's ability to properly manage protein folding, leading to the accumulation of misfolded proteins, cellular stress, and inflammation, which contribute to DCM pathogenesis. Ongoing studies aim to clarify the functional consequences of these modifications to better understand BAG3's regulatory mechanisms and their relevance to cardiac disease.

4. Arginine Methylation Inhibits Neighboring Hyperphosphorylation on Histone H3 to Limit Breast Cancer Spread

Presenter(s): Shaina Ambashta

Advisor(s): Dr. Cecilia Lopez

Epigenetic modifications of histone proteins regulate chromatin structure and gene expression during essential cellular processes such as mitosis. Among these, phosphorylation of histone H3 at serine 10 (H3S10ph) "primarily catalyzed by Aurora B kinase" is linked to chromatin condensation and transcriptional activation, and is frequently elevated in aggressive cancers like breast cancer. However, the regulatory impact of nearby post-translational modifications on this phosphorylation event remains poorly understood. This project explores the hypothesis that methylation of arginine 8 (H3R8), a residue adjacent to serine 10, may interfere with phosphorylation at H3S10. This hypothesis is grounded in prior evidence of post-translational modification crosstalk within the RKS motif of histone H3. To investigate this, we used a two-

pronged approach: molecular modeling of Aurora B binding to H3 peptides, and in vitro kinase reactions to experimentally assess phosphorylation levels under different modification states. Preliminary data suggest that dimethylation of H3R8 may reduce phosphorylation at H3S10. Molecular models support this possibility by showing predicted structural interference near the kinase binding site. These findings, while hypothetical, contribute to ongoing efforts to decode the histone modification landscape and offer a potential framework for understanding how epigenetic regulation can be disrupted in cancer.

5. Understanding Calmodulin and HIV Matrix protein interactions through Circular Dichroism and Fluorescence Spectroscopy

Presenter(s): David Nguyen

Advisor(s): Dr. Jerry LaRue

HIV-1, or human immunodeficiency virus type-1, is a virus of critical biomedical interest because it attacks the immune system and can lead to AIDS, a life-threatening condition. HIV-1 matrix proteins (MA) are a crucial component in the viral replication cycle, playing a role in virion assembly and membrane targeting. Calmodulin (CaM) is an essential calcium-binding messenger protein found in all eukaryotic cells, and it is known to undergo conformational changes upon calcium binding. The purpose of this project is to investigate the interactions between Calmodulin and HIV-1 MA proteins, which are known to bind under calcium-rich conditions. To characterize this binding, we used both Circular Dichroism (CD) spectroscopy and Fluorescence spectroscopy. In CD spectroscopy, left- and right-circularly polarized light is passed through protein samples to detect differential absorption, allowing us to infer changes in secondary structure, such as alpha helices or beta sheets, during protein-protein interactions. Meanwhile, fluorescence spectroscopy was used to provide complementary information about binding events by tracking changes in the emission spectra of fluorescent residues, particularly tryptophan, which is sensitive to its local environment. Together, these techniques provide both structural and dynamic insights into the CaM–MA interaction, contributing to a deeper understanding of HIV-1's replication mechanism and potential therapeutic targets.

6. Examining Viral HIV Matrix Protein Interactions with Calmodulin

Presenter(s): Eliza Gilbert, Maahi Rakholia

Advisor(s): Dr. Jerry LaRue

Human Immunodeficiency Virus (HIV) attacks the T lymphocytes in the body's immune system that help fight infection and disease. If left untreated, the HIV virus has the possibility of progressing into AIDS, a chronic disease with a high fatality rate. The ability for HIV to replicate is regulated by HIV Matrix Protein (MA). When the matrix protein comes in contact with Calmodulin (CaM), a calcium-binding eukaryotic messenger protein, MA undergoes a conformational change signaling the viral replication of HIV-MA, leading to the replication of HIV. When MA is bound to CaM, it decreases MA's compact structure, leaving the MA binding sites conformationally open. Hindering the MA binding sites is predicted to lead to a decreased rate of HIV replication, and understanding this interaction could lead to a new target for antiviral therapies preventing the

progression of HIV. The interaction between CaM and HIV-MA is being explored using fluorescence spectroscopy. Fluorescence spectroscopy utilizes the excitation state of amino acids to analyze samples. At the binding site of the core conformation, MA contains tryptophan, an amino acid that fluoresces upon excitation. The absorption spectrum of tryptophan at the binding site can be analyzed to further understand the protein-protein interactions of CaM and MA. Using the information, the role CaM plays in HIV viral replication can be better understood and lead to new possibilities for HIV treatment.

7. The Effects of EV Concentration on Inflamed Tissues versus Healthy Tissues

Presenter(s): Alondra Burgos

Advisor(s): Dr. John Miklavcic

Extracellular vesicles (EVs), including exosomes and microvesicles, have emerged as crucial mediators of intercellular communication. Their role in modulating inflammatory processes has gained increasing attention, particularly due to their ability to transport bioactive molecules such as microRNA (miRNA), proteins, and lipids. Under pathological conditions, EVs can influence immune responses by regulating cytokine signaling, gene expression, and tissue repair mechanisms. This review aims to explore the concentration and composition of EVs in inflamed tissues compared to healthy tissues, with a specific focus on the regulatory function of miRNA cargo in modulating inflammation. A literature-based analysis was conducted to examine recent findings on EV biogenesis, the role of EV-associated miRNA in immune signaling, and their differential expression in inflammatory versus non-inflammatory states. Key miRNA such as miR-146a, miR-155, and miR-192 were identified and evaluated for their involvement in inflammatory signaling pathways. Findings indicate that inflamed tissues release EVs in greater abundance and with distinct miRNA profiles compared to healthy tissues. These EVs are enriched with pro-inflammatory or immunoregulatory miRNA that targets critical signaling molecules and transcription factors involved in the immune response. The differential presence of EVs and their miRNA content holds diagnostic value and may serve as biomarkers for various inflammatory conditions. Understanding their molecular composition and behavior in diseased versus healthy states opens new avenues for diagnostic and therapeutic strategies in managing inflammatory disorders.

Biological Sciences

8. The Morphological Journey of Hagfish Slime

Presenter(s): Jewelz Cook

Advisor(s): Dr. Douglas Fudge

Hagfish deploy a unique defense mechanism by ejecting slime that rapidly expands in seawater, clogging a predator's gills. This slime is composed of coiled threads and mucous vesicles, which rupture and transform upon contact with water. This project investigates how turbulence drives the transformation from the initial exudate to the fully expanded slime, with a focus on identifying

and visualizing the intermediate stages of this process. One key structure observed in this progression is the formation of "holey sheets," which may represent a transitional phase leading to mucous filaments roughly 200 microns thick. I will present data on slime thread and mucous morphology, including pore size, fiber diameter, and the structural changes occurring throughout expansion.

9. Determinants of Metabolic Rate of Western Atlantic Hagfish (*Myxine limosa*)**Presenter(s):** Renata Spinelli**Advisor(s):** Dr. Douglas Fudge

Hagfishes are jawless, eel-like marine vertebrates that scavenge carcasses on the seafloor and are well known for producing defensive slime that can clog the gills of predators that attack them. Among vertebrates, they have some of the lowest metabolic rates (MRs), an adaptation likely linked to their deep-sea lifestyle in cold, hypoxic environments. However, little is known about how MR in hagfishes responds to stress and temperature changes. In this study, we measured oxygen consumption in the Western Atlantic hagfish (*Myxine limosa*) under varying conditions using custom respirometry chambers and a Witrox respirometry system. We tested how exposure to conspecific slime, time of day, and temperatures ranging from 1°C to 11°C influenced MR. Slime exposure was associated with a slight decrease in MR. Time of day had no significant impact on MR. MR significantly decreased as temperatures decreased, but the response at the lower temperatures plateaued. Our findings suggest that *M. limosa* maintains extremely low MRs even under variable environmental conditions.

10. Stable Expression of Green Fluorescent Protein in Chia Using Tissue Culture**Presenter(s):** Elisa Heo**Advisor(s):** Dr. Hagop Atamian

Salvia hispanica L., commonly known as chia, is a seed crop from the mint family used historically in ancient cultures. In recent times, chia has become tremendously popular as a "superfood" for its high nutritional content and benefits. However, chia has not been used as a food source for consumption over the past 600 years, and research on this crop is limited. Consequently, our understanding of its growth and development mechanisms is less comprehensive compared to well-studied crops such as corn, rice, and tomato. Plant tissue culture (in vitro, sterile culture) is valuable in genetically modifying individual plant cells. This technique involves the asexual propagation of plants from a single vegetative cell. This allows for the study of gene functions through genetic modification of individual plant cells, creating a complete plant from a single genetically modified cell. This is done by cultivating a single plant cell within a sterile environment with specific nutrients, hormones, and chemical solutions to stimulate shoot and root formation in vitro. This technique has allowed solutions to significantly difficult agricultural challenges such as drought tolerance, disease resistance, and crop yield increase. Despite its popularity, a tissue culture protocol for chia is not available yet, and through this research, a successful tissue culture protocol was developed. Seeds were sterilized and grown on Murashige and Skoog (MS) plant growth media. This sterile plant media was then induced with growth hormones Benzyl

aminopurine (BAP) to produce shoots and Indole 3-Butyric Acid (IBA) to produce roots. The availability of tissue culture protocol for chia is a considerable advancement and will significantly contribute to the future genetic study of this nutritionally valuable crop by the scientific community.

11. Leaf Functional Traits of California Native Shrubs Toyon (*Heteromeles arbutifolia*) and Lemonade Berry (*Rhus integrifolia*) in a Coastal and Inland Population

Presenter(s): Chantelle Osuna, Gabby Carbonel, Juana Villanueva, Andrew Chen, Alexander Orlove

Advisor(s): Dr. Joseph Waterton, Dr. Kate Hill

Studying plant traits across climatic gradients provides insight into future adaptive responses of plant populations to climate change. In Mediterranean climates, inland populations tend to experience more extreme temperatures than coastal counterparts. To evaluate the adaptive potential of native shrubs to climate change in Orange County California, we measured a set of leaf traits in field-sampled individuals of *Heteromeles arbutifolia* (toyon) and *Rhus integrifolia* (lemonade berry) in a coastal and inland population. We also quantified leaf photosynthetic thermal tolerance (T50) based on chlorophyll fluorescence (FV/FM). Both species showed some level of differentiation in their leaf traits (e.g., surface area, stomatal conductance) between the two sites, consistent with adaptation to local climate. However, in both species, T50 values were similar across sites, suggesting potential limits to adaptive responses in leaf thermotolerance and perhaps greater vulnerability of inland populations to extreme temperatures that may push plants closer to their limits of leaf thermotolerance. Our study demonstrates the importance of integrating trait-environment relationships within species into evaluating vulnerability of plant populations to climate change.

Business

12. AI and the Metaverse in Business Strategy

Presenter(s): Emma Han, Emma Nguyen

Advisor(s): Dr. Cristina Nistor

The Metaverse has quickly become an important part of the future of the business world. Mainstream companies like Walmart, Toyota, Nike, and many others have established a presence with virtual goods (NFTs), virtual spaces for consumers to interact, and employees to collaborate and train. Yet there is little research into Metaverse strategies that are efficient and sustainable over time. With the rise of AI, businesses now have the opportunity to integrate AI and the Metaverse as complementary technologies, reshaping their strategies for innovation and competitive advantage. We researched the top 500 global brands to uncover lessons from entry approaches taken. Our research aims to identify how AI has helped increase the adoption of the Metaverse and determine its viability in the short term and long term. Our research has practical implications on how this technological shift will shape the future of business strategy.

13. How Layoff Influencers Navigate Personal Branding on TikTok**Presenter(s):** Sarah Cheah**Advisor(s):** Dr. Gokcen Coskuner-Balli

This study explores how layoff influencers steer their personal brands on social media after experiencing layoffs. Existing literature on person brands emphasizes the duality of person brands as both human and commercial entities (Fournier & Eckhardt, 2019), their strategic positioning within established fields (Parmentier et al., 2013), and their evolution within digital attention economies (Smith & Fischer, 2020), leaving how individuals rebuild personal brands during transitional periods unexplored. This study focuses on layoff influencers-individuals who document their experiences and rebuild professional identities post-layoff-as a compelling context to explore how personal brands evolve under vulnerability and disruption. It asks: "How do layoff influencers navigate their personal branding journey on social media after job termination?"

The research adopts a netnographic methodology and analyzes TikTok activity from 20 layoff influencers across diverse industries between 2020 and 2024. Creators were selected using keywords such as layoff influencer, funemployment, and layoff journey. A dataset of 1,145 videos (average of 57.2 per creator) was qualitatively analyzed to uncover themes in narrative structure, audience engagement, and use of platform features.

The findings show that individuals used layoffs as opportunities to pivot into new industries or entrepreneurial ventures. Four main themes were identified: First, financial resilience, as individuals reassessed budgets, sought short-term gigs, or relied on savings. Second, mental health, with layoffs triggering shame and identity loss, but also prompting rediscovery of passions and life realignment. Third, career reinvention, with some transitioning into full-time influencers and building personal brands tied to their expertise or new niches. Lastly, advocacy for workplace equity, as influencers critiqued abrupt terminations and pushed for systemic change.

This study contributes to the literature on personal branding through the documentation of individuals navigating layoffs in the digital age.

Chemistry**14. Investigating the Effects of Different Parameters on the Morphology and Optical Properties of ZnO Nanocrystals****Presenter(s):** Jamie Chin**Advisor(s):** Dr. Cedric Owens

ZnO nanostructures, specifically nanorods, have promising properties that make them good candidates as hosts of qubits for quantum computing, particularly their wide band gap, low spin-orbit coupling, and ability to dope with shallow donor defects with long-lived spin coherence. However, there are several parameters that can impact the morphology of the ZnO which may result in undesirable, amorphous products with poor optical properties. In the synthesis, it is hypothesized that an amine nucleophilically attacks the Zn(OAc)₂ to form ZnO, making it an

important reagent in the reaction. Therefore, we investigated the degree of substitution on the amine, amine chain length, and the addition of solvent to understand the impact that synthetic parameters play on the morphology and optical properties of the ZnO nanorods. It was found that using shorter chain, primary amines and adding solvents such as trioctylamine (TOA) and 1-octadecene (ODE) to the synthesis produced the most uniform ZnO nanorods with the best optical properties.

15. Hot Electron Chemistry on Bimetallic Au Core-Shell Nanoparticles

Presenter(s): Brianna Zamora, Olivia Guyette, Stephanie Hoang, D'Angelo Alvarez

Advisor(s): Dr. Jerry LaRue

With the evolution of carbon emissions, carbon dioxide pollution levels have grown immensely. This issue can be combated by the conversion of either carbon monoxide or carbon dioxide into methanol through plasmonic photocatalysis. This process converts these pollutants into environmentally friendly catalysts. Specifically, we observe bimetallic transition metal core-shell nanoparticles as plasmonic photocatalysts. Due to their unique properties, these nanoparticles can facilitate photocatalytic reactions by exhibiting hot electron chemistry. The focus of the project involves the use of a gold (Au) core metal in the bimetallic core-shell nanoparticles. The gold core nanoparticles are then synthesized and paired with either rhodium, ruthenium, or nickel shells. Each is synthesized with a reflux apparatus, washed under centrifugation, and further characterized. Characterization techniques include Ultraviolet Absorption Spectroscopy (UV-Vis), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), and Energy-Dispersive X-ray Spectroscopy (EDS). Characterization of every synthesized sample reveals the dispersivity, size, shape, and distribution of elements. After characterization, the bimetallic core-shell nanoparticles are tested in the photoreactor chamber with mass spectrometry. In this process, the oxidation of carbon monoxide, hydrogenation, and combustion of oxygen can assess the photocatalytic efficiency of the core-shell nanoparticles. This work aims to provide more knowledge of eliminating previously mentioned pollutants and instead creating renewable fossil fuel alternatives.

16. Hot Electron Chemistry on Bimetallic Gold Core-Shell Nanoparticles

Presenter(s): Olivia Guyette

Advisor(s): Dr. Jerry Larue

With the rise of CO₂ emissions, a significant global climate challenge has emerged such as global warming, driving the need for innovative solutions. One approach to reducing CO pollution involves converting CO or CO₂ into methanol (CH₃OH) using catalysts, which lower the reaction barrier for the reaction and increase efficiency. Plasmonic photocatalysts offer a promising method for producing green fuels, including methanol, by enhancing light-driven reactions that convert CO₂ into valuable chemicals. Our plasmonic photocatalysts are composed of bimetallic transition metal core-shell nanoparticles, which have unique optical properties, such as enhanced light absorption and localized surface plasmon resonance (LSPR), as well as catalytic properties like increased reaction rates and stability. These properties boost their photocatalytic efficiency

compared to traditional catalysts, enabling the creation of hot electrons for use in excited state chemistry. One side of this project focuses on bimetallic core-shell nanoparticles with Gold (Au) as the core metal. As of current, rhodium (Rh), Ruthenium (Ru) have been used as the shell metal, and within this upcoming year the goal is to also incorporate nickel (Ni). These shell metals were selected because they exhibit similar optical properties, such as LSPR and catalytic properties that are comparable to those of the gold core. Both Au/Rh and Au/Ru nanoparticles are synthesized through reflux reactions, followed by washing via centrifugation, and characterized using Scanning Electron Microscopy (SEM), Energy-dispersive x-ray spectroscopy (EDS), and Ultraviolet Absorption Spectroscopy (UV-Vis). The characterization of these synthesized bimetallic core-shell nanoparticles reveals favorable size, elemental distribution and shape, which align with theoretical expectations and design criteria for optimal performance, pending further testing of their photocatalytic activity. To assess their photocatalytic efficiency, we plan to perform CO oxidation, as well as hydrogenation reactions, as these processes are crucial.

17. Literature Review of Gold Nanoparticles and their Applications

Presenter(s): Marcus Bartholomew

Advisor(s): Dr. Jerry LaRue

The many intriguing properties of gold nanoparticles have created a widespread interest in how they might be utilized in certain fields. Gold, which has been known throughout history to be one of the most inert substances on Earth, has been found to become highly reactive and demonstrate significant catalytic activity when reduced to nanoparticle size (0 - 100 nm). Additionally, gold nanoparticles have been found to exhibit intriguing optical properties that are not observed with regular gold. These findings have been attributed by researchers to the potency of the localized surface plasmon resonance (LSPR) effects observed in gold nanoparticles. These realizations have led to the implementation of gold nanoparticle usage in many disciplines, mainly those relating to solar energy, catalysis, and biomedicine. Gold nanoparticles are currently being investigated by research teams across the world for their potential to make breakthroughs in some of the most prevalent areas of research such as cancer therapy, clean energy, and ammonia synthesis to name a few. This review of gold nanoparticles is meant to provide an overview of their historical significance, how they are synthesized, and how they might make a difference moving forward based on current day research developments.

18. Characterizing Plasmonic Au Nanoparticle Core-Shell Photocatalysts through CO Oxidation

Presenter(s): Melia Hernandez, Aidan Tran

Advisor(s): Dr. Jerry LaRue

Being a world where transportation is crucial, catalysts are essential for speeding up the chemical reactions required to produce fuels. There are many distinct categories of catalysts ranging from organic to inorganic that can involve expensive materials and extreme chemical environment conditions to initiate the catalyst activity. In the place of expending higher temperatures and pressures to synthesize this outside energy source, a natural source of energy can be used instead,

such as the sun. To be more energy efficient, photocatalysts, which require solar energy to initiate their catalytic activity can speed up various industrial processes, including, but not limited to, the synthesis of syngas. More specifically, using a photocatalyst comprised of a plasmonic gold core nanoparticles would be beneficial due to the presence of a collection of oscillating electrons in the core, which allow it to absorb light more efficiently compared to other materials. However, to tune the electronic structure of the gold to suit a wider variety of reactions, a gold core-transition metal shell structure can alter the reactant-surface bond. To determine the most efficient core-shell ratio and transition metal type, starting with a well-known reaction, such as CO Oxidation, and progressing to more complex reactions, such as CO Hydrogenation, would allow the characterization of different shell variations to create a more effective photocatalyst for a wide range of reactions. Combining photochemistry with the catalyst's plasmonic ability, selective bond activation can be achieved, which can aid in reactions with a usually nonreactive species. This category of plasmonic bimetallic catalysts can be further explored and better understood to synthesize a more energy efficient class of catalysts.

19. Experimental Determination of pKa of Morphine-Like Molecules (Tertiary Amines) Using Nuclear Magnetic Resonance

Presenter(s): Anna Cuzick, Mia Sharma, Bradley Sonnichsen

Advisor(s): Dr. Matthew Gartner, Nayiri Alexander, Makena Augenstein

With the opioid crisis impacting millions worldwide, understanding the molecular properties of opioids such as morphine is an important factor when addressing addiction. The relative amounts of the protonated and deprotonated form of morphine, a tertiary amine, depends on the pH of the solution it is in. Protonation influences its ability to bind to the μ -opioid receptor (MOR), which plays a crucial role in pain relief and addiction. At physiological pH, morphine exists in a balance between its protonated and deprotonated forms, allowing it to bind both in inflamed tissue (pH 6.5) and the central nervous system (CNS, brain and spinal cord, pH 7.4), where addiction can develop.

The pKa of morphine, 7.9, determines this balance by indicating the pH at which protonation occurs. Lowering the pKa could shift the protonation state at physiological pH, potentially reducing CNS binding and addiction risk. In previous computational studies, several fluorinated morphine derivatives were proposed to have lower pKa values, suggesting decreased CNS activity. To validate these computational predictions, an accurate and reproducible experimental method for pKa determination is necessary.

This study aims to establish a reliable experimental approach for determining pKa values using nuclear magnetic resonance (NMR) spectroscopy. Pyridine and triethylamine were selected as model compounds, and their protonation states were observed under varying pH conditions. Using the chemical shift data collected using NMR and the Henderson-Hasselbalch equation, the pKa was quantified. By refining experimental pKa determination, this research provides a foundation for validating computationally predicted pKa values of opioid derivatives.

20. Theoretical and Experimental Synthesis β -Fluorinated Morphine Derivative for Selective Binding in Inflamed Tissue

Presenter(s): Thu Doan, Amelia Bayha, Adel Martinez

Advisor(s): Nayiri Alexander, Dr. Matthew Gartner

Over the past two decades, the United States has experienced a substantial rise in opioid overdoses and related fatalities. Morphine is a frequent prescription for pain management following traumatic procedures and contributes to potential tolerance and dependency with prolonged use. By reconstructing the structure of morphine, adverse side effects may be eliminated. Previous studies have identified several morphine derivatives that, in theory, could result in fewer side effects. This was determined by a decreased pK_a of the biochemically active amine group to promote the selective binding in peripheral opioid receptors within inflamed tissue ($pH=6-6.5$). This activation provides analgesia while central receptors within the brain remain inactive, thus preventing undesired side effects associated with opioids. The study aims to experimentally synthesize the novel opioid derivative Fluoromorphine \hat{I}^2 -C2 from a theoretical synthesis plan assisted by computational resources. A SmilesCode generator created a single-line string of symbols to illustrate a 3-dimensional molecular compound. These symbols were inputted into IBM RXN for Chemistry, an AI synthesis program, to determine a theoretical synthesis plan starting from the compound 2-chloro-3-fluoromethoxypyridine. The resulting information was cross-referenced with peer-reviewed articles and experts in the field. The first synthesis step was a palladium-catalyzed dechlorination and hydrogenation, which used palladium on carbon in methanol. Stoichiometric ratios of reagents were used to calculate the corresponding masses and volumes of Pd/C, methanol, and the starting reagent. The first step was completed in vivo, and H1 NMR concluded no desired product was synthesized. According to IBM RXN, the reaction step has high confidence (0.965), indicating additional attempts with procedural adjustments could be fruitful. This would mark a significant achievement toward the synthesis of a morphine derivative less capable of the dangerous side effects associated with narcotics.

Communication Studies

21. Conversations with AI: How Perceived Conversation Partners Influence Trust, Intimacy, and Persuasion

Presenter(s): Hannah Torres, Lily Goldklang, Sarah Garcia, Cordelia McKenna, Maya Ginsburg

Advisor(s): Dr. Rebecca Forster

This study explores how people relate to and interact with AI chatbots. More specifically, this study examines how the perception of conversation partners alters an individual's aversion to trust, intimacy, and willingness to be persuaded. Hypotheses of this study include: H1: Individuals who believe they are conversing with a real person will feel more trust in the conversation target than those who believe they are communicating with an AI chatbot. By assuming the conversation partner is a person rather than an AI chatbot, the perceived connection the participant has impacts their aversion to trust. H2: Individuals who believe they are conversing with a real

person will feel more intimacy (emotional closeness) in the conversation target than those who believe they are talking to an AI chatbot. The assumption of conversing with a real person capable of reciprocating emotional intimacy impacts the participant's aversion to emotional intimacy. H3: Individuals who believe they are conversing with a real person will be more influenced to follow the advice suggested by the conversation partner than those who believe they are conversing with an AI chatbot. It is expected that the participants' perceived emotional connection with a human conversation partner impacts their willingness to be persuaded positively. To test these hypotheses, we conducted an experiment in which participants were asked about their involvement in a series of activities (e.g., sunscreen usage, willingness to attend a local blood drive, etc.) They are then prompted to converse on that subject with either an AI chatbot or a person online (though all participants receive the same AI chatbot-generated responses). Trust, intimacy, and persuasion were measured through self-report surveys and behavioral responses.

22. How Emotional States Influence Forgiveness and Criticism of Celebrities

Presenter(s): Joseph Schlom Casey Cox Garrett Hogan Connor Frandzel Kade Zimmerman

Advisor(s): Dr. Rebecca Forster

Independent: forgiveness Dependent: mood Variables are both continuous Test: T-Test for Hypothesis 1 and 2 This study examines how mood, induced by stimuli, influences participation in celebrity bashing and levels of empathy and forgiveness towards celebrities. Specifically, the study seeks to examine whether induced happy moods or sad moods affect behaviors such as celebrity bashing. We measure mood and forgiveness to explore these concepts in relation to celebrity bashing. The study tests two hypotheses: (H1) Individuals experiencing sadness will engage in more celebrity bashing than those experiencing happiness; (H2) Individuals experiencing sadness will exhibit lower levels of forgiveness towards celebrities than those experiencing happiness. To test these hypotheses, participants will be asked about their general knowledge of the celebrity, and be exposed to different stimuli to induce specific emotional states. Likert scales and stimuli will assess participants' engagement in mood, likeness to bash, and forgiveness in this study. By exploring how mood affects perceptions of celebrities and related behaviors, this study aims to reveal the role of emotional states in shaping social judgments and actions.

23. Fanfiction & Parasocial Romantic Relationships

Presenter(s): Rachel DeLaurenti, Lourdes Duque, Jon Jauregui, Alex Cocoros, Sean Oriotis

Advisor(s): Dr. Rebecca Forster

Our research examines the ways in which different kinds of fanfiction impact parasocial romantic relationships, which are one-sided emotional bonds that people develop with fictional characters or celebrities. We will be looking at how narrative perspectives affect the strength of these emotions, specifically the effects of self-insert narratives versus original character narratives. Self-insert narratives involve using the placeholder "Y/N," which stands for "your name," to allow readers to insert themselves into the story with their favorite media figure. Conversely, original character narratives utilize the creation of an entirely new character written by the author to act

as the main character in the story. Both of these narrative styles can be written from either the first-person point of view or the third-person point of view. In comparison to third-person self-insert fanfiction, we anticipate that (H1) first-person self-insert fanfiction, which puts the reader in the narrative, will foster a higher sense of romantic commitment. In addition, first-person self-insert will have the biggest effect, third-person self-insert will cause a moderate response, and fanfiction based on (H2) original characters will result in the smallest parasocial romantic tie. In order to test these hypotheses, we conducted a study using Qualtrics to gauge the strength of parasocial romantic feelings when engaging with different types of narrative fanfiction. Participants were randomly assigned to read either a first-person self-insert or third-person self-insert, as well as a fanfiction focused on their chosen media figure and an original character. They then answered a series of questions that measured the intensity of their romantic parasocial relationship after reading the fanfiction excerpt, and another set regarding identification with the original character in the story. This study will help provide insight into the ways that immersive storytelling impacts emotional connections, especially in the digital age when parasocial relationships are becoming increasingly common.

Computer Science

24. HoloMind: Engineering Mindfulness through Holographic Display

Presenter(s): Jaime Song

Advisor(s): Dr. Franceli Cibrian

Although interactive technology is evolving, many holographic displays still operate more like fixed presentation tools than responsive systems. This research seeks to enhance the capabilities of the Dreamoc HD3.2, a three-sided holographic display by Realfiction, by integrating motion detection technology to enable real-time user interaction. Currently, the Dreamoc HD3.2 can only display preloaded 3D content via HDMI or SD card, restricting its engagement potential. By incorporating a motion detection camera, we will allow users to interact with the holographic content using hand gestures, creating a more immersive and dynamic experience. This project builds on prior research, which focused on optimizing 3D content using Adobe Substance 3D Stager and Realfiction's design templates. This poster presents the first iteration of the design and implementation of the functional motion detection system, defining a set of user movements that will trigger specific holographic responses. The methodology includes iterative software-hardware integration, gesture recognition programming, and user testing to refine the interactive experience. Expected outcomes include a working prototype of an interactive holographic display, insights into gesture-based interaction with holograms, and an evaluation framework for assessing user engagement. By bridging human-computer interaction and digital wellness, this research contributes to the evolution of immersive media technologies. Future directions will explore AI-driven personalization and multi input systems, expanding the potential applications of holographic displays in education, wellness, and public engagement.

25. DanZens: A Toolkit for Sensing, Labeling and Visualizing Dance Movements

Presenter(s): Yanelly Mego

Advisor(s): Dr. Franceli Cibrian

Dance is an art form and discipline that requires strong foundational movements to express creativity and emotion effectively. Wearable technology offers new opportunities for analyzing complex movements in dance where precision, coordination, and feedback are key. This motivated the creation of DanZens, a novel toolkit that integrates real-time motion data collected via DanceTag with visualizations generated by DanceVis to generate detailed and actionable feedback for dance movements. DanceTag (Data Analytics and Notation with Captured Event Tagging) is a platform developed in Unity (i.e., a cross-platform game engine) that collects information from Sony's Mocopi sensors in the form of Biovision Hierarchy (BVH) files. These files contain the coordinates of the participant's joints for every recorded frame, effectively capturing their movement. DanceVis, on the other hand, is designed to convert raw motion data from DanceTag into meaningful visual feedback for both instructors and students. The system's primary visualizations are heatmaps that compare movement similarity using the Dynamic Time Warping (DTW) algorithm. DTW is a method for comparing time-series data, assigning higher scores when the time series diverge and lower scores when they align. Using BVH files from DanceTag, DanceVis transforms captured movement data into individual time-series datasets for each of the 27 joints tracked by the Mocopi sensors. This granular breakdown enables a detailed analysis of specific body parts requiring improvement. Designed to advance pervasive computing in interactive and creative domains, DanZens demonstrates the potential of wearable technology to transform movement analysis and learning experiences.

This abstract is based on a demo paper by Y. Mego et al., titled "DanZens: A Toolkit for Sensing, Labeling, and Visualizing Dance Movements," presented at the 2025 IEEE International Conference on Pervasive Computing and Communications (PerCom), Washington, D.C., USA, 2025.

26. Predicting Sports Performance with Graph Neural Networks

Presenter(s): Noah Fuery, Chris Ton-That

Advisor(s): Dr. Peter Jipsen

This research project is centered around investigating the effectiveness of Graph Neural Network (GNN) architectures towards predicting NBA player-level performance statistics. Prior studies have used alternative architectures, including Gradient Boosting Machines, simple feed-forward Neural Networks, and Recurrent Neural Networks. Primarily following a baseline study conducted by Rui Luo and Vikram Krishnamurthy, who introduced the novel GATv2-TCN model trained on data from the 2023 NBA season, our study proposes an updated and enhanced framework that utilizes more current 2024 season data. In doing so, our study also aims to analyze multiple GNN variants, most notably Graph Convolutional Networks (GCNs) and Graph Attention Networks (GATs). The central research question explores whether graph-based models, which here build upon a well-defined graph structure leveraging the inherent relational dynamics of player

interactions, are able to outperform traditional tabular machine learning approaches in predictive accuracy and interpretability.

We construct player graphs with players as nodes, and team affiliations, historical game matchups, and statistical trends as edges to create our feature set. Performance evaluation on the GCN, and GAT models will involve comparative metrics such as accuracy, root mean square error (RMSE), mean absolute error (MAE), and R2.

We anticipate that the GATv2-TCN, embedded with an attention layer and temporal output layer, will outperform the baseline GCN in player-performance prediction tasks. Overall, this project aims to demonstrate the practical value of developing a graph dataset to leverage graph-based deep learning particularly in the sports analytics domain.

27. Representability and Formalization of Relation Algebras in the Lean Theorem Prover

Presenter(s): Pace Nelson

Advisor(s): Dr. Peter Jipsen

Abstract relation algebras were defined by Alfred Tarski in 1941 to capture the algebraic properties of binary relations. An interesting question is whether a given relation algebra is representable as an algebra of binary relations. Donald Monk proved in 1964 that the theory of representable relation algebras is not finitely based, and Robin Hirsch and Ian Hodkinson in 2001 showed that it is an undecidable problem whether a finite relation algebra is representable. However, Roger Maddux's concept of n-dimensional bases and Steve Comer's one-point extension method can prove (non)representability for various small algebras. Both methods are based on a two-player game for representability, and we revisit implementations of these algorithms and apply them to relation algebras with up to 32 elements. In particular, to decide representability for all relation algebras with 16 elements, the n-dimensional bases implementation was used in 1993 to prove the nonrepresentability for the last two such algebras. Checking these proofs by hand is rather laborious but can now be done with the help of proof assistants. Lean is an interactive theorem prover that uses a formal language based on dependent type theory to represent mathematics. Its library of definitions and theorems spans many areas of mathematics, including parts of algebra, logic, order theory and category theory. Alongside, Dr. Jipsen, we develop the theory of relation algebras in the Lean proof assistant. Lean is also an efficient functional programming language, hence this is a useful platform for implementing algorithms and checking mathematical results obtained by computer calculations. We report on the current state of our project without assuming any background about Lean.

Electrical Engineering**28. Demonstration of Mach Zehnder Interferometry in Free-Space: An Experimental Approach****Presenter(s):** David Giani**Advisor(s):** Dr. Nasim Estakhri

Mach-Zehnder interferometers split a source beam between two beam paths and utilize their phase difference to collect information on the environment. The current methods of optical free-space interferometry require spacious structures such as polarizers, lenses, and prisms, limiting their applications outside of laboratory settings. Our proposed solution leverages 3D-printed ultra-thin metasurfaces, modeled and optimized in COMSOL, to achieve high efficiency, accurate free space measurements. The components consist of a wave source, a beam splitter, a phase shifter and restoring pair, and beam restoring metasurfaces. Modular interlocking 3D printed elements compose each surface, facilitating rapid fabrication, flexibility, and easy maintenance, necessary characteristics for any real-world application. A programmable powered rail system allows for measurements at variable distances between the antisymmetric surfaces. Using a network analyzer, we collected permittivity values of PLA, resin, and glass-filled nylon, all in the range of 2.3-2.7. For the purpose of our experiment, higher epsilon materials allow for smaller profile metasurfaces without a loss of performance. Based on our measurements, GF nylon's high permittivity and reliable printing results distinguish it as the best material for our applications. We have also modeled our experiment in COMSOL multiphysics and simulated it using nylon. To reduce fabrication time and expenses, we chose an operating frequency of 4GHz, allowing for smaller and thinner metasurfaces. We have optimized the system in COMSOL with the collected experimental value of 2.7 for the permittivity of nylon. These optimized structures are used for fabrication. We plan to use the same strategy for printing, as we used for our test samples (i.e., interlocking elements).

29. Near-field Control with Metasurfaces**Presenter(s):** Michael Cheng**Advisor(s):** Dr. Nasim Estakhri

This research shows a possible path to creating arbitrary near-field distributions using metasurfaces with 100% efficiency. It has been shown that this is theoretically possible using metasurfaces of different admittances (N. Estakhri et al., 2017 IEEE APS & USNC/URSI, pp. 1723-1724). Our research consists of figuring out a method to generate metasurfaces that produce the prescribed near-field, manufacturing that metasurface, and subsequently testing it. For this purpose, we constructed a model in the electromagnetic modeling software COMSOL Multiphysics. We then used the genetic algorithm optimization in MATLAB to generate a series of metasurfaces that match the desired calculated admittances. To create the surface, we used an LPKF ProtoLaser S4 to remove copper from a sheet of FR4 in the desired pattern. Currently we are in the process of building a 2-D gantry to take measurements of the near-field across the

surface. Possible applications of near-field control are sensing and particle trapping, due to the possibility of creating high power concentrations at the near field.

Environmental Science and Policy

30. Assessing the Impact of Weathering on Arsenic Bioaccessibility at Empire Mine, California

Presenter(s): Elena Skender, Mariah Tsuruda, Andrew Tahhan

Advisor(s): Dr. Christopher Kim

The mining industry has historically been integral to California's economic wealth. In recent years, there has been a significant increase in the number of inactive mine sites across the state. Studying inactive mine sites is beneficial in learning about the health risks associated with the mines and how they affect humans and the environment. This study focuses on Empire Mine, an abandoned gold mine in Nevada County, California, and is currently a state historic park that welcomes around 100,000 visitors a year. The Kim Environmental Geochemistry (KEG) Lab examines the release of arsenic (As) at Empire Mine and its effect on humans. Arsenic is a naturally occurring metalloid that is commonly found in gold mine tailings, and ingesting arsenic can cause a variety of health issues, including respiratory, cardiovascular, and gastrointestinal issues. This study focuses on gastrointestinal issues by placing the samples in a simulated gastric fluid to simulate ingestion. The samples are then analyzed using an inductively coupled plasma-optical emission spectrometer (ICP-OES) to determine the bioaccessibility of arsenic found in the samples. Another important component of this study is how weathering affects the bioaccessibility of arsenic. We evaluate how weathering affects the bioaccessibility of arsenic by grinding samples to simulate weathering.

FFC

31. What Should A Woman's Body Look Like? Here's What Digital Media and Pop Culture Says...

Presenter(s): Amelia Sidney

Advisor(s): Michol Hebron

My research will explore how the visual representation of women's bodies in media and pop culture over the past 30 years have influenced modern society's unrealistic body standards for women, as well as how these stereotypes have harmed our current generation.

Research has shown that the body stereotypes of women shown in digital media have severely worsened body dysmorphia for generations of young girls. That dysmorphia lowers self-esteem, which often leads to symptoms of depression and anxiety. This has ultimately led to increased levels of self-harm, suicidal ideation, and other mental illnesses in adolescents. In addition to those findings, I will be looking at the correlation between women's bodies in video games and

animated movies/TV shows, and how the combination of those digital medias has resulted in reaching a wider audience. Over the years, the online misrepresentation of women's bodies has only continued to grow exponentially, through body-altering filters on social media apps such as tik tok and instagram, as well as celebrities who post pictures of themselves that are edited to make their bodies look closer to the ones the media keeps showing on screen.

My methodology involves looking for existing studies that show the impacts of gender biases in digital media. I will also be using the other research strategies outlined in the Information Literacy portion of my FFC canvas program, which includes using the Leatherby Library database to find peer-reviewed articles and published studies.

I envision that my research will clearly demonstrate that the popularity/exposure of animated women has direct linkage between changing the body standards society holds for real women. Evidence is also expected to show the detrimentality of these unfair stereotypes upon young girls in particular, but also the general population.

Film

32. Guns, Explosions, and Extreme Violence: Action cinema and its Critique of American Culture

Presenter(s): Karthik Davuluri

Advisor(s): Dr. Erica Aguero

The action film genre has often been criticized for prioritizing formulaic storylines, extravagant set pieces, and extreme violence at the expense of narrative complexity, thematic richness, and cultural significance. High-concept and big-budget action films are frequently disregarded by critics and general audiences for lacking artistic merit or substance. This study aims to present a renewed understanding of action films as cultural artifacts that reflect the zeitgeist of their respective eras, rather than discounting them as trivial and outdated. Critics panned many action films during the 1980s to the early 2000s for their promotion of toxic ideologies such as extreme violence and hypermasculinity, expressed through superficial storylines, which contributed to the genre's dismissal. In his writings, Lennart Soberon analyzes early and contemporary action films, demonstrating how action sequences are not simply vehicles for entertainment but are meaningful elements of the genre. Soberon explains that action sequences starting in the 1980s embody social, cultural, and historical factors relating to the Vietnam War and American imperialism. Using scholarly writings, action films such as RoboCop (Verhoeven, 1987), Predator (McTiernan, 1987), Total Recall (Verhoeven, 1990), Starship Troopers (Verhoeven, 1997), and Bad Boys II (Bay, 2003). Using the previous critical discourse surrounding these films, this study analyzes the genre tropes, action sequences, and violence of these films to communicate the idea that the American high-concept action film has always been inherently critical regarding aspects of American culture such as imperialism, toxic masculinity, and extreme violence. Although high-concept action films are highly stimulating and contain what appear to be surface-level storylines

and themes, they are much more thematically complex and nuanced than they are presented to be.

33. Resurrected Criminals, Time-Loops, and Faustian Bargains: The Supernatural Edge of 1940s Film Noir

Presenter(s): Tyler Bolden

Advisor(s): Dr. Erica Aguero

In the 1940s, as film noir reached its peak of generic legitimacy, a more uncanny and supernatural variant took shape in its shadows: speculative noir. While its hard-boiled roots, Expressionist aesthetics, and the lyrical fatalism of French Poetic Realism often define traditional noir, certain films of the period infused the genre with Lovecraftian horror, gothic elements, weird science, and reality-warping phenomena. This overlooked strand of noir guided the genre's murky boundaries beyond fatalistic crime narratives and into what science fiction writer Fritz Leiber evocatively calls the "dark dangerous forest"—a realm of eerie, ghostly, and unknowable forces. Although scholars such as James Naremore and Christopher Orr have explored film noir's paradoxical nature as well as its semantic and syntactic complexities, its intersection with speculative fiction in the 1940s remains underexamined. This study addresses that gap by defining speculative noir as a distinct iteration of the noir tradition. The differentia specifica of this variant lies in its expansion of noir's chiaroscuro, doom-laden world, achieved through the integration of supernatural and science-fictional elements. These elements draw on the narrative traditions of *Weird Tales* and the works of prominent speculative writers such as H.P. Lovecraft and Clark Ashton Smith, in conjunction with themes of moral degeneration and deterministic fate. Analyzing films like *Decoy* (1946), *Repeat Performance* (1947), and *Alias Nick Beal* (1949), I will demonstrate how this mode reshaped the genre's boundaries and laid the groundwork for Hollywood's 1950s science fiction boom. Using semiotics and Steve Neale's framework of genre as repetition and difference, I position speculative noir as both a product of industrial practice and a reflection of cultural anxieties in the atomic age—particularly those surrounding cosmic insignificance, the psychological aftermath of war and the Frankensteinian fear of scientific overreach.

34. Analysis of Jordan Peele's Get Out: White Liberalism and Performative Activism

Presenter(s): Dalia Halwani

Advisor(s): Dr. Ian Barnard

This piece explores the white liberalism and and performative activism analyzed from the Jordan Peele film, *Get Out*. The essay is arguing that the film exposes how racism persists even in "progressive" spaces. While overt racism is often condemned, Peele's film highlights the subtler, more insidious forms of racism that manifest through microaggressions and fetishization. Peele's use of psychological horror and satire forces viewers to confront the uncomfortable reality that White allies can still be complicit in the system they claim to oppose.

Health Sciences and Kinesiology**35. Spirituality and Spiritual Experiences as Predictors of Cardiovascular Health: Associations with HDL and LDL Cholesterol Levels****Presenter(s):** Mark Meltzer**Advisor(s):** Dr. Julia Boehm

Spirituality and spiritual experiences have been linked to well-being, but their associations with cardiovascular health markers remain underexplored. This study examined how spirituality—defined as a sense of greater meaning or purpose—and spiritual experiences—meaningful interactions tied to beliefs—relate to lipid profiles. We hypothesized that greater spirituality and more frequent spiritual experiences would be associated with higher HDL (good cholesterol) and lower LDL (bad cholesterol) levels. Data were drawn from up to 927 participants in the second and third waves (2004–2014) of the Midlife in the United States study. Participants (56.4% women; 93.1% white) completed validated measures of spirituality and spiritual experiences. Fasting blood samples were used to assess HDL and LDL levels. Multivariate linear regression models controlled for age, gender, race, education, and lipid-lowering medication use. No significant concurrent association was found between spirituality and HDL. However, longitudinal analyses revealed a positive association between spirituality and HDL in age-adjusted models, though not in fully adjusted models. Interestingly, spiritual experiences were positively associated with higher LDL in both age-adjusted and fully adjusted longitudinal models, suggesting a potential cardiovascular risk. These findings highlight a complex relationship: spirituality may support beneficial HDL levels, while frequent spiritual experiences might be linked to higher LDL. Further research is needed to clarify these dynamics and their implications for heart health. This study has advanced my academic development by deepening my expertise at the intersection of spirituality, psychology, and cardiovascular health. It strengthened my skills in longitudinal research and multivariate modeling—tools essential for exploring biopsychosocial phenomena. By integrating spiritual and emotional dimensions into health research, this work enriches my scholarly perspective and supports my goal of contributing innovative insights to the field of health psychology.

36. Sex Disparities in Medical Curricula to Pre-Health Professions Students**Presenter(s):** Vania Nasrieh, Vivian Nguyen, Thu Doan, Kelly Ung**Advisor(s):** Dr. Michelle Cleary, Dr. Jean-Louis Bru, Dr. Christine Crispen

Despite medical advancements, studies indicate that women with acute myocardial infarction (MI) are more likely to experience fatalities and/or delays in healthcare compared to their male counterparts (Stehli et al., 2020). By disregarding unique symptoms and risk factors that female patients present, healthcare providers may miss the crucial time window for treatment, delaying life-saving interventions (Mnatzaganian et al. 2020). Recognizing the critical role of sex biases and sex-specific MI symptoms is paramount for developing targeted interventions and improving the overall quality of care for female patients at risk for heart attacks (Rai et al. 2021). This study aims

to evaluate students' ability to accurately diagnose MI in patients based on sex-specific symptoms as well as the extent to which their professors taught them about sex biases in healthcare. Two anonymous IRB-approved Qualtrics surveys were created for undergraduate pre-health students and current healthcare professions students in Southern California. Qualtrics surveys modeled after USMLE Steps 2 & 3. The undergraduate pre-health survey included a joint lecture with UCI Women's Heart Services, where students took pre- and post-lecture surveys, which educated students about sex-specific patient inequities in cardiology. Students were randomly assigned a survey containing either a clinical profile for a male or female MI patient and distraction profile(s). Study results indicated that the diagnostic accuracy of female MI patient profile was lower than the male MI patient profile. Furthermore, a majority of students indicated that they did not have professors who educated them about the adverse effects of sex bias in patient care. The future direction is to develop workshops and classes with graduate and undergraduate programs to better educate students on sex bias and enhance their ability to discern sex-specific symptoms in MI.

History

37. Requiem for the Floating World: Nonnormative Sexuality and Gender in Japanese Art, Edo vs. Post-Pacific War Japan

Presenter(s): Freddy Netto

Advisor(s): Dr. Alexander Bay

This study explores how Japanese visual and literary arts have portrayed nonnormative sexuality and gender expression, focusing on the Edo Period (1603–1868) and post-Pacific War Japan (1945–present). Particular emphasis is placed on how such depictions reveal evolving notions of identity, desire, and deviance within a shifting Japanese historical framework. Analyzing various media, such as woodblock prints, literature, theater, film, and manga, this project examines how social, political, and cultural shifts have shaped the depiction and understanding of these themes. The role of societal context in shaping artistic production is central to this exploration: How did different governance systems, international influences, and cultural ideologies affect both the content and creators of these works? This research considers how narratives about sexuality and gender are constructed, limited, or challenged across time and media. Through comparative readings and historical context, it uncovers the similarities and differences in representations of nonnormative identities, from Tokugawa Era erotic prints to late-20th- and 21st-century manga queer romance. By doing so, it provides insights into Japan's evolving culture, emphasizing how changing representations reflect broader societal negotiations around identity, power, and normativity, especially within periods of upheaval or reinvention. Ultimately, this project aims to enhance interdisciplinary discussions on gender, sexuality, and art history by highlighting how Japanese artistic practices have both reflected and mediated humans' complexities across centuries.

38. The Commander's Crusade: Bush's Campaign for War in Iraq**Presenter(s):** Aliyah Ramirez**Advisor(s):** Dr. Jeffrey Koerber

In recent history, the United States has never been more tested than in the wake of September 11, 2001. Early on that Tuesday morning, members of al-Qaeda hijacked commercial airliners and successfully crashed them into the Pentagon and both towers of the World Trade Center, killing nearly 3,000 people and actualizing the deadliest terrorist attack on US soil. A few weeks later, with international, congressional, and the American public's unwavering support, President George W. Bush unveiled his mission to eradicate the world of evil and terror once and for all. While many believed Bush would appease his war ambitions by avenging the United States through his invasion of Afghanistan, attacks on al-Qaeda training camps and Taliban installations in that turbulent nation were only the beginning moves of what would become known as the two-decade long Global War on Terror. Some members in Bush's cabinet saw 9/11 as the perfect opportunity to topple longtime foe, Iraqi dictator Saddam Hussein. Yet no evidence tied Saddam Hussein to the 9/11 attacks, nor that he had aided al-Qaeda. Support for war against Iraq, therefore, would need a strong case. This research explores the Bush administration's campaign for war in Iraq, how the American people reacted to this campaign and how these efforts affected the overall perceptions of the war as it unfolded. Ultimately, this research argues that the Bush administration led a yearlong campaign for war in Iraq by downplaying and suppressing dissent and misrepresenting shaky evidence to sustain a campaign producing high support for war in Iraq. Yet as the truth of the situation was uncovered in the first year of the occupation of Iraq, public support for the war plummeted.

39. From Pagan Chieftains to Christian Kings: Shaping Medieval Nordic Political Culture**Presenter(s):** Carissa Chinnery**Advisor(s):** Dr. Jeffrey Koerber

This research investigates how the Christianization of Scandinavia between the 800s and 1100s transformed Nordic political culture, particularly in relation to governance, kingship, and Scandinavia's integration into European Christendom. The adoption of Christianity contributed to the centralization of power, replacing the previous decentralized chieftain-based system with hereditary monarchies legitimized through Christian ideology. Additionally, the establishment of church institutions played a critical role in administrative development, reinforcing royal authority and expanding government structures. Methodologically, this study analyzes historical texts such as *Heimskringla* by Snorri Sturluson, which offers a narrative perspective on Christianization. Archaeological evidence, including church remains, runestones, and burial sites further illustrate the material and symbolic transformations that accompanied religious change. By synthesizing these textual and material sources, this research builds on the scholarship of Anders Winroth and Nora Berend, whose work emphasize the intersection of ideology and political evolution in medieval Scandinavia. The findings suggest that Christianization was not merely a religious transition but a catalyst for significant political change. Kings leveraged Christianity to consolidate power, weaken rival chieftains, and establish structured administrations modeled after European

counterparts. The church provided a literate clerical class that aided in governance, while religious reforms integrated Scandinavia into the broader European political and cultural sphere. Ultimately, this study highlights the influence of religion on state formation, demonstrating how Christianization reshaped Nordic political identity and laid the foundation for the medieval Scandinavian kingdoms.

40. The Impact of Historical Memory: Polish-Russian Relations since 1991**Presenter(s):** Conner Lipinski**Advisor(s):** Dr. Jeffrey Koerber

The history of global foreign relations is marked by both strengthening alliances and deteriorating ties. From a historical perspective, a perfect example of this dynamic is seen in the complex and ever-evolving relationship between Poland and Russia. This research focuses on the history of Polish-Russian relations in connection to Poland's response to Putin's war in Ukraine. This research project's examination into this history will serve to answer a central question: How has the shared history of Polish and Russian relations uniquely shaped Poland's portrayal of Russia, in relation to the Polish response of Putin's invasion of Ukraine? Like its Ukrainian neighbors, Poland has spent nearly two centuries of its history under Russian rule, and occupation, which is why their shared history directly connects to their portrayal of Russia. By looking at the two countries' shared history, this research will specifically focus on how Poland has used history to represent a specific image of Russia since the fall of the Soviet Union in 1991. This will be shown through analysis of Polish depictions of Russia in past and present contexts. Sources include news articles and scholarly historical works that directly analyze key events in Poland's history where Russia has been involved. The result of this research is to determine how Poland's use of historical memory as a political tool highlights history's impact on contemporary foreign relations.

41. How has Billie Jean King's Success On and Off the Court Changed Women's Athletics?**Presenter(s):** Ilianna Serna**Advisor(s):** Dr. Jeffrey Koerber

As a leader in women's sports, Billie Jean King is most recognized for her efforts to promote equal opportunities for women in sports. Her legacy goes beyond her tennis accomplishments as she was an essential supporter for equal opportunity for female athletes. This research looks at Billie Jean King's success on and off the court and how she ultimately changed tennis and women's athletics. Born in 1943, Billie Jean King, became well-known for her aggressive and smart style of play, racking up 39 Grand Slam trophies, including 12 in singles, 16 in women's doubles, and 11 in mixed doubles.. King's most well-known success occurred in the 1973 "Battle of the Sexes," the match where she beat male tennis star Bobby Riggs. In addition to proving her image as a champion, her victory raised awareness of the cause of women's equality in sports across the country. But her influence went well beyond her athletic accomplishments. King founded the Women's Tennis Association and started womenSports magazine to support female athletes in a variety of sports as part of her off-court efforts to improve their pay and recognition. She also contributed to the founding of the Women's Sports Foundation, which still promotes gender

equality in athletics today. Wanting equal opportunities for women in athletics, education, and life, King's activism paralleled the establishment and enforcement of Title IX. Countless athletes of recent generations have been inspired by her and have declared how much she has impacted their lives.

42. Jews of the Antebellum: A Spectrum of Beliefs on Slavery**Presenter(s):** Raquel Kelley**Advisor(s):** Dr. Jeffrey Koerber

How did recently arrived Jewish immigrants to the United States respond to the debates over slavery in the years leading up to the American Civil War? Jews from Central Europe joined people from various European countries in the stream of immigration to the United States, seeking new opportunities and freedom from persecution. When these Jewish immigrants arrived in the United States, the country was deeply divided over the issue of slavery. As America divided itself along the Mason-Dixon line, so did the new Jewish communities. My research seeks to learn what factors drove some Jews to support abolitionism, while others were driven to support white supremacist agendas pervasive in the Southern states. The Jewish communities had no single stance on the issue of slavery in the United States, as some advocated for the emancipation of the enslaved black population, while others deeply resonated with Southern lifestyle and economic practice. To gain insight into the mindset of these Antebellum Jews, I look to memoirs from Jewish abolitionists, Jewish slave-owners, and Jews who fell in between on the political spectrum of the time. In addition to memoirs, newspapers of the era were littered with opinions and stories of Jews, alongside short autobiographies and sermons by several rabbis. This research ultimately finds that the greater American Jewish immigrant communities of the Antebellum expressed a wide range of opinions on the issue of slavery in the United States, stemming from their social, economic, and religious backgrounds.

43. American Collusion with the Republic of South Africa during the Angolan Civil War**Presenter(s):** Stuart W. Ledbetter**Advisor(s):** Dr. Jeffrey Koerber

Between 1948 and 1994, the Republic of South Africa enacted one of the most brutal white supremacist regimes in recent history, known as Apartheid. Across the world, nations pressured South Africa to end its racist legislature through economic sanctions, limited diplomatic contact, and non-cooperation with the government. The United States was one such nation to decry Apartheid, as it stood against American values of equality and freedom. This all changed when the Angolan Civil War broke out in 1975, and South Africa stood as the primary neighboring anti-communist interventionist in the conflict. This research explores exactly why and how the United States chose to compromise its values and support and cooperate with a regime they had previously detested. Over a fifteen-year span (1975–1990), the US Congress turned from divestment in Apartheid South Africa to actively funding and supplying their military campaigns in Angola. Through analyzing declassified government documents from the US Executive Branch and Central Intelligence Agency, a clear picture emerges demonstrating the gradual shift in

American perceptions of the role of the United States as an anti-communist bastion first, and a warrior for international peace and justice second. Right after the United States ceased their materiel involvement in the war in 1990, they went right back to opposing Apartheid. This demonstrates that, during the last decade of the Cold War, America's dominant efforts continued to be spent defeating communism, not upholding American values.

44. Death, Violence, and Condemnation: The News Media Coverage of the 1981 Prisoners' Hunger Strike in Northern Ireland in the United Kingdom and Ireland

Presenter(s): Tyler Coker

Advisor(s): Dr. Jeffrey Koerber

During the Troubles, the ethno-political conflict between the majority Catholics and minority ruling Protestants in Northern Ireland that lasted from 1968 to 1998, the 1981 prisoners' hunger strike in Belfast's HM Prison Maze was a key turning point. The starvation death of 10 striking prisoners gained the world's attention, as one by one Irish prisoners died in British custody. This tragedy helped push the Irish nationalist movement toward a diplomatic means of negotiation. As one of the most influential events during the conflict, the news media covered the strike extensively, shaping the narrative of the strike to largely uninformed audiences. Newspapers presented differing perspectives of the hunger strike as it unfolded. This research will focus on news coverage of the hunger strike in Irish and British papers, dissecting how these media outlets guided the flow of information from Northern Ireland through their headlines, editorial choices, and perspectives. Seeing how the media differently portrays the same series of events, this study emphasizes the power of the media in shaping interpretations of events.

45. Mother India and Her Children: Gender and National Identity in Katherine Mayo's Mother India

Presenter(s): Amala Rajagopal

Advisor(s): Dr. Jeffrey Koerber

When assessing the knowledge possessed by her fellow citizens about India, early twentieth-century American journalist Katherine Mayo felt the narratives and ideas about the British colony were lacking. Her dissatisfaction sent her to India as an "unsubsidized, uncommitted, and unattached" observer. In May of 1927, she published *Mother India*, a detailed, critical perspective on Indian society, religion, and the plight of women, mainly focusing on the practice of child marriage. Yet the political conclusions Mayo draws in her inquiry point against Indian self-rule. Her encouragement of continued colonial rule by the British Raj ignited a multitude of reactions from both admirers and critics. Despite the controversy, *Mother India* drew significant global attention, with translations and reprints in many languages, including various Indian languages and reprints in many countries. My research revolves around the publication of *Mother India*, its content, and its reactions to Mayo's arguments in India and globally. I seek to identify and explore the claims made by Mayo through analysis of the book's impact as a tool of colonial control and narrative construction, its effect on ideas of nationhood and Indian self-rule, and its role in shaping the position of women in Indian national identity. Mayo's work illuminates the nature of

national and social identity in a colonized state and its development in response to imperial powers.

46. "Is it America First or Is it Not?": The Daughters of the American Revolution and U.S. Nationalism during World War I

Presenter(s): Amala Rajagopal

Advisor(s): Dr. Jennifer Keene

The National Society of the Daughters of the American Revolution, known as the DAR, is a lineage-based service organization for women who are descended from individuals who contributed to the American Revolution. Established in 1890, the organization works to promote education, patriotism, and historic preservation. With the outbreak of war in Europe in 1914 and America's initial but contested neutrality, rising anxieties began surrounding the query of where its citizens would place their allegiance became necessary for the American government. The DAR endorsed this effort and throughout the war, sought to preserve patriotism and combat dissenting ideologies, incorporating the growing antiradical and Americanization movement of the late 1910s into their mission. This research seeks to explore the role of the DAR in promoting the war, the relationship between the Revolutionary War and World War I, and the usage of the relationship in promoting the war effort amongst Americans. This project establishes how the Daughters of the American Revolution endorsed patriotic and nationalist rhetoric during World War I, serving as a point of reference to understand the changing political climate during World War I and the role of a female patriotic organization in promoting nationalist and nativist values. Examining the climate of the DAR's patriotism alongside American neutrality and growing nationalism during the Great War showcases how the Daughters of the American Revolution contributed to the creation of a distinct war culture during World War 1. This research establishes an additional understanding of the effects of American patriotic groups and their promotion of "America First" in their mission during World War 1, providing historical context to the rise of U.S. nationalism and the way in which patriotism can be used to develop the ideology.

47. The Psychological Effects of World War I on French Society

Presenter(s): Lauren Hazel

Advisor(s): Dr. John Boitano

World War I had a profound impact on French society. After the war, the French were affected not only by material losses but also by the psychological trauma inflicted upon them. Living day to day as a poilu in the horrific trenches of the war left lasting marks on soldiers in ways that would be felt for decades. Adjusting to life after the war was difficult for soldiers and civilians alike, and the adjustment created ripples throughout French society. This paper examines how the daily conditions of World War I, the medical phenomenon of "shell shock," and the post-war period altered the psychological state of French soldiers. Additionally, it explores how these psychological effects manifested in French art and film. Through an analysis of daily life in the trenches, the psychological and physical wounds of war, and their impact on post-war artistic

expression, this study highlights the deep and lasting consequences of World War I on both the individual and collective experiences of the French Society.

48. Sports Diplomacy: The Sport of Ping-Pong in Sino-U.S. Relations

Presenter(s): Alexander Guzman

Advisor(s): Dr. Kyle Longley

The Sino-U.S. relationship following the end of the Chinese Civil War in 1949 provides a positive example of using sports diplomacy during the Cold War era with the event of Ping-Pong Diplomacy in 1971. Ping-Pong Diplomacy was an accidental interaction between the U.S. Table Tennis Team and the Chinese Table Tennis Team at the Table Tennis World Championships in Nagoya, Japan in 1971 where American player Glenn Cowan had missed the team bus to one of the events, and he was invited onto the bus of the Chinese team. He and the captain of the Chinese team, Zhuang Zedong, had a positive interaction, and Zedong gifted Cowan a silk cloth with an image of the Huangshan Mountains. Photographs and news of the interaction quickly circulated capturing the attention of both the U.S. Government and the Chinese Governments, and the U.S. team received a formal invitation from the Chinese government just two days after inviting the U.S. team to participate in a Ping-Pong exhibition tour or Friendship Matches throughout China. The countries began developing a benevolent relationship in various ways. Both nations removed their trade embargos against each other which allowed China to begin operating within the Western markets as well as allowing the United States to trade within Eastern markets, but primarily allowing the countries to trade with each other directly. The removal of these embargos acted as a catalyst for growth of the economies of both nations increasing the advantages that either nation may now hold over the Soviet Union, and American and Chinese citizens were now able to travel between both countries promoting a stronger cultural understanding between the two nations. U.S. President Richard Nixon was formally invited to China in 1972, and the Chinese accepted to participate in a Ping-Pong tour in the U.S. following the President's visit. The U.S. secured a formal diplomatic channel with China by 1979 that still exists today. Ping-Pong Diplomacy improved Sino-U.S. relations proving that Sports Diplomacy can continue to play a role in international diplomacy.

49. Interwoven Histories of Los Angeles's Ethnic Communities

Presenter(s): Anya Nguyenkhoa

Advisor(s): Dr. Vivian Yan-Gonzalez

In modern-day Los Angeles, the three largest minority groups that make up the city are Hispanic or Latino, Asian, and African American. These communities are credible pillars of the Los Angeles we know and love today, and can further warrant their place in Los Angeles culture through their complex and weaving histories. During World War II, Japanese Americans and those of Japanese descent were indiscriminately relocated and incarcerated into internment camps after the bombing of Pearl Harbor. The internment and thus the absence of Japanese in Los Angeles made room for Black Americans during a time when colored housing was scarce, introducing the development of Black communities like Bronzeville. As pillars of California's agricultural industry

at the time, the absence of Japanese Americans also created a significant labor shortage that led to the creation of the Bracero Program, a short-term contract labor program that brought millions of Mexican workers to the United States. After the signing of Executive Order 9742 that dissolved the order for relocation, Japanese Americans were confronted with newcomers who seemingly took their place. In this confrontation, Japanese Americans, Black Americans, and Mexican Americans met with each other and their own biases and prejudices, thus leading to areas of both discomfort and conflict, and coexistence and coalition. While Los Angeles has long been regarded as a beacon of culture and diversity in California, studying the histories of African-, Japanese-, and Mexican Americans and their relations to one another only enriches the story and cultural identity of the people of the City of Angels.

Honors

50. Appreciating the Time We Have and Growing Old: M. Night Shyamalan's "Old"

Presenter(s): Calliope Whitworth

Advisor(s): Dr. Ian Barnard

Growing old and experiencing the signs of aging is something that every human must experience. Unfortunately (or fortunately) for the human race, there is no Fountain of Youth or Sorcerer's Stone to prolong our supposedly "ideal" young bodies. In a society plagued with impossible beauty standards revolving strongly around the features held only by youth, how do people experience aging and deal with it? How does society treat older people? This paper will attempt to give answers on how to experience aging, how to deal with it, how to find value in age, and how to appreciate the time we have. These questions are explored through two modern horror movies (in addition to articles written by several famous horror movie critics). The first of these movies is M. Night Shyamalan's movie, "Old," which explores the concept of what happens to a group of people when they are forced to age rapidly—at a rate of one year every 30 minutes. Although there are more obvious aspects to this thriller, aging is a large part of visceral horror that is experienced by the audience. Watching smooth skin wrinkle, agile fingers turn gnarled and cracked, spines bend, and hair turn gray becomes the key to terrifying the audience. The second movie is Coralie Fargeat's "The Substance," which leaves little room for interpretation. This movie deeply criticizes society's beauty and youth standards and portrays what happens to people—particularly women—who don't fit this "ideal image." Through these films, this essay will show audiences that aging is not something to be horrified at, but rather something to be cherished, enjoyed, and respected.

51. Pretty, Possessed, and Powerful: Feminist Horror in Jennifer's Body

Presenter(s): Georgia Oliver

Advisor(s): Dr. Ian Barnard

This project interrogates the 2009 horror-comedy Jennifer's Body, directed by Karyn Kusama and written by Diablo Cody, as a site of feminist resistance within genre cinema. The film channels

female rage and critiques the pervasive objectification of women in both media and broader sociocultural contexts. Through the supernatural transformation of Jennifer Check into a predatory figure, the narrative metaphorically examines the cultural punishment inflicted upon women who assert sexual agency. Subverting the archetypal “sexy victim” trope, Jennifer reclaims her body as a locus of power and revenge. Concurrently, the emotionally charged and ambiguously queer dynamic between Jennifer and her best friend Needy deepens the film’s horror, foregrounding the often-overlooked complexities of female friendship and desire. However, the film’s radical feminist message was significantly undermined by a marketing campaign that sexualized Megan Fox to appeal to a presumed heterosexual male demographic—ironically perpetuating the very dynamics the film critiques. Employing feminist film theory and cultural analysis, this study conducts a close textual reading of the film’s narrative structure, visual motifs, and dialogue to expose the tensions between content and commodification. It also situates the film within contemporary feminist discourse, examining its critical reappraisal in the era of #MeToo and ongoing debates surrounding consent, embodiment, and media representation. Ultimately, this project argues that Jennifer’s Body serves as both a prescient cultural critique and a reclamation of horror as a genre capable of articulating female anger, autonomy, and resistance against structures of patriarchal control.

52. Dark Echoes of the Repressed in Texas Chainsaw Massacre Part 2**Presenter(s):** Itzel Corona**Advisor(s):** Dr. Ian Barnard

Horror films fulfill a unique psychological need in contemporary society, allowing viewers to confront and release repressed impulses. Tobe Hooper's *The Texas Chainsaw Massacre, Part Two* (1986) exemplifies how the genre explores deeper themes, particularly through phallic symbolism and the unconscious mind. Using the chainsaw as a phallic symbol, the film delves into power dynamics, sexuality, and societal norms, reflecting Freud's theory of the return of the repressed. This paper applies Freudian psychoanalysis, drawing on works by Murray Leader and Linda Williams, to explore how repressed desires manifest in the film. The chainsaw represents twisted masculinity, with Leatherface embodying repressed sexual and gender desires. The protagonist, Stretch, transitions from victim to empowered figure, challenging traditional gender roles and highlighting the link between violence, power, and sexual control. The film critiques conventional horror tropes, offering a nuanced exploration of repression, gender identity, and cultural power relations.

53. As Above, So Below: the Cognitive Impact of Found Footage Horror**Presenter(s):** Josephine Railston**Advisor(s):** Dr. Ian Barnard

What makes a horror movie good? Why do we like horror movies? Using the 2014 movie *As Above, So Below* my poster presentation explores the cognitive impact of found footage horror on its viewers. Employing the use of a handheld camera and first person perspective, the film is able to immerse its audience in a supernatural version of the Paris Catacombs. I discuss found

footage as a narrative tool, particularly focusing on how it amplifies psychological and physical responses like fear and anxiety.

54. Liberté, Egalité, et Fraternité? Titane's Critique of Gender Roles in French Culture**Presenter(s):** Kaylin Smith**Advisor(s):** Dr. Ian Barnard

While often overlooked, horror films have the unique opportunity to offer insight and critiques of society. They can create horror by forcing audiences to confront their fears and anxieties. These fears inside horror film narratives offer new perspectives on broader cultural norms and ideas. Julia Durcournau's *Titane*, a 2021 Palme d'Or winner at the Cannes Film Festival, is a contemporary French horror film praised for its striking portrayal of gender roles within the larger context of French society. Historically, politically, and linguistically, gender roles are intertwined within French culture. How does *Titane* portray gender roles and what is the larger story being told? Building off of the work of previous horror film scholars such as Tanya Modeleski's work on the connection between horror film monstrosity and culture to Carol Clover's "Final Girl", this project will examine aspects of the film such as character development, setting, and various other cinematic choices. This project aims to explore the portrayal of ever-evolving gender roles within French culture.

55. Speak No Evil, Hear No Woman**Presenter(s):** Layla Bahmani, Olivia Ledger**Advisor(s):** Dr. Ian Barnard

Throughout the history of film, male characters have traditionally been depicted as heroes, while their female partners often take on the "damsel in distress" role. But what happens when these roles are reversed? The 2022 film *Speak No Evil* explores this switching of stereotypes and addresses the societal pattern of accepting behavior that should not be tolerated. *Speak No Evil* is an adrenaline-inducing psychological horror film that offers deeper commentary on topics such as female intuition, societal norms, and family dynamics. We analyze how the film portrays the dismissal of a woman's instincts in favor of maintaining politeness and social harmony. Throughout the movie, the American husband repeatedly ignores and minimizes his wife's warnings about the British family they are visiting, resulting in devastating consequences. We argue that the film critiques both gendered power structures and broader social expectations that pressure individuals to suppress discomfort. Through rhetorical analysis of key scenes, we show how *Speak No Evil* uses horror conventions to highlight the dangers of ignoring intuition and the consequences of silencing female voices.

Mathematics**56. Impact of Summer Math Bootcamp Participation on STEM Student Academic Performance and Success****Presenter(s):** Kristen Ng, Sadie Tak**Advisor(s):** Dr. Criselda Toto Pacioles

This study examines the impact of the Summer Math Bootcamp on STEM students' success in math courses and their overall GPA. The Summer Math Boot Camp provides incoming STEM students with the necessary mathematical skills and confidence to succeed in college coursework through intense lecture and practice sessions for two weeks in the summer. The data collected from the participants of the Summer Math Bootcamp (number of days attended and scores in the formative assessments during the sessions) were combined with demographic information (race, STEM major, gender) and academic performance (math grades and overall GPA) of the different cohorts of STEM students at Chapman University to determine if the Summer Math Boot Camp is significantly correlated to the student's success. One result from the research shows that there is a positive relationship between attendance at the boot camp and student GPA. However, various factors not investigated with the boot camp attendance may also significantly affect the GPA, including course load, high school math background, the student's major, etc. Of those who attended the boot camp, the average GPA of the students enrolled in a math class was significantly lower than the average GPA of those who did not take a math class during the year they attended the boot camp. With the additional information being gathered from the cohorts of the Math Boot Camp and the inclusion of a more structured assessment of the student math comprehension pre/post boot camp, the researchers' goal is to obtain a deeper understanding of what affects student success and if the participation in the boot camp contributes significantly to this success.

57. Statistics - What Does My Data Say About Me?**Presenter(s):** Taylor Gadsden-Deterville**Advisor(s):** Dr. Oliver Lopez

For my Introduction to Statistics Class, I have been tasked with collecting unique, personal data to give insight into my daily routine. I decided to record nine different outcomes (two qualitative and seven quantitative). On February 6, 2025, I began with a blank Excel sheet, and so far, I have 57 full days of data collected. I will continue monitoring my findings for the remainder of the Spring 2025 Semester. Per my project instructions, I must include tables and graphs for my qualitative and quantitative outcomes. So far, I have collected daily quantitative data on my screen time (Instagram and TikTok), panther bucks spent, hours of studying, bike riding time, bedtime, and waking time. My daily qualitative data are "yes" and "no" responses to whether I met with a friend and whether I drank matcha. I hope to analyze trends in my daily routines as a student and research areas of improvement in my data. The information I collect should give me insight through outliers, frequencies, averages, and various other values. After analyzing the

project results, I can apply my knowledge to improve or maintain aspects of my daily routine in future semesters.

Physical Therapy

58. Development and Feasibility of an Immersive Feedback Protocol to Reduce Knee Moments and Pain with Potential Application to People with Knee Osteoarthritis

Presenter(s): Evan Shrier

Advisor(s): Dr. Natalia Sanchez Aldana, Dr. Shawn Farrokhi

Background: Osteoarthritis (OA) is the most common cause of disability in the US, affecting 1 in 5 people. Of that, 45% will experience OA in at least one knee. To alleviate pain and prevent knee OA disease progression, walking modification techniques have been proposed. While studies and meta-analyses exist suggesting reductions knee moments due to these modifications (Bechard 2012, Bowd 2019, Fregly 2012), little conclusive evidence exists quantifying their effectiveness. Objective: This research aims to assess the feasibility of an immersive bio-feedback system that provides real-time information about how to effectively perform walking modifications that reduce knee moments and pain. Methods: We reviewed the literature to identify how many publications exist supporting each walking modification, and the five most prominent were selected. The Gait Real-Time Analysis Interactive Lab (GRAIL) system at the Chapman University Rinker Campus was utilized; the GRAIL is instrumented with a dual-belt treadmill, 10 motion capture cameras and D-Flow software, providing custom, gamified visual feedback based on real-time data. We created custom MATLAB code to assess reduction of knee moments during each modification. We tested one healthy adult (F57) to assess the feasibility of our feedback system. Results: From the literature review, we identified the following modifications and their ideal ranges: toe-in, toe-out, (both 10-15°) wider steps, (8-12 cm) ipsilateral trunk lean, (10-15°) and medial knee thrust. (4-8°) The D-Flow software calculated the relevant angles for each modification and in real-time, we projected them on an immersive screen as a bar graph. Using the walking modifications, the participant overall reduced knee moments between 0% and 25%. Conclusion: We confirmed that walking modifications can reduce knee joint moments, and that a real-time biofeedback system that instructs participants on the modifications is feasible. Further testing will be done to quantify the effectiveness of walking modifications for knee OA patients.

59. Performance in Strength TUG and Cognitive TUG among Stroke Survivors

Presenter(s): Samuel Hendrickson, Vidhi Bharuka

Advisor(s): Dr. Rahul Soangra

Stroke often results in long-term impairments in mobility, strength, and cognitive function, significantly impacting the quality of life of survivors. Rehabilitation efforts traditionally focus on physical recovery; however, growing evidence suggests that cognitive factors play an equally vital role in functional outcomes. This research project aims to explore the interplay between muscular strength, mobility, and cognitive function in the context of post-stroke rehabilitation. By

investigating how these components interact, the study seeks to inform more holistic and effective recovery strategies. Participants will undergo a series of assessments, including the Timed Up and Go (TUG) test, the Cognitive Timed Up and Go (CogTUG) test, and standardized muscular strength evaluations. The TUG test provides a measure of basic functional mobility, while the CogTUG incorporates a cognitive dual-task element, allowing for the assessment of mobility under cognitive load. Muscle strength assessments will target lower limb function, which is essential for gait and balance. Data will be analyzed to identify correlations between cognitive performance, physical strength, and functional mobility. The primary objective is to determine the extent to which cognitive function and muscular strength independently and jointly influence mobility outcomes in post-stroke individuals. We hypothesize that deficits in either domain will be associated with poorer performance on mobility tasks, and that the combination of low strength and impaired cognition will have a compounding effect. Findings from this study are expected to contribute to a deeper understanding of the mechanisms underlying recovery and mobility in stroke survivors. These insights will be valuable in tailoring rehabilitation interventions that address both cognitive and physical impairments, ultimately improving functional independence. This experiment was done as a part of a series of tests ultimately meant to help assess fall risk.

Physics

60. Optimizing Emitters and Geometrical Designs for Enhanced Sub-Ambient Radiative Cooling Efficiency

Presenter(s): Paige Ho

Advisor(s): Dr. John Howell

Thermal radiation is the process by which an object emits heat to its surroundings through electromagnetic waves while radiative cooling describes the loss of heat experienced by the object as a result. Radiative cooling is a sustainable solution to removing thermal energy due to its ability to achieve sub-ambient temperatures without the input of other energy forms by utilizing Earth's atmospheric window of 8-13 μm wavelength. At this IR window, absorption of solar radiation coincides with peak blackbody radiation at 300K to emit heat into space. A radiative emitter consists of an insulating layer, reflective layer, and a selective radiator. The goal of this investigation was to maximize cost reduction while comparing how geometry of the reflective layer impacts the effectiveness of the radiative emitter. Four emitters were constructed, two parabolic and two flat emitters, each with a reflective layer of aluminum foil and a low-density polyethylene (LDPE) layer to prevent debris or dew interference. Each structure was further compared with the use of a shaded structure to limit solar heat. This shaded structure was built of polystyrene and lined with aluminum mylar. All emitters utilized polystyrene for the insulating layer and barium sulfate for the selective emitter. The geometric shape was constructed using the thermoplastic material found in 3D printing filament. Data collection revealed the greatest negative difference in ambient temperature was achieved with the flat emitter inside the shaded

structure at -11°C . Future directions include exploring alternative reflective, insulating, and emitter materials for their applicational capacity in future radiative cooling designs. One emitter material of interest is the petals of the white *Phalaenopsis amabilis* orchid. Results show *P. Amabilis* petals to have high reflective abilities but poor absorption in Earth's atmospheric window, reducing its radiative cooling capacity.

Political Science

61. Artificial Intelligence: A New Platform to Influence Elections

Presenter(s): Robert Arellano

Advisor(s): Dr. Andrea Molle

Since its inception in 2022, artificial intelligence has impacted education, social relationships, job markets, and politics all while using a system of machine learning through algorithms. The creation of artificial intelligence comes at a pressing time for the United States as last November was the first presidential election in American history with the presence of artificial intelligence. Some political and business leaders have expressed concerns over artificial intelligence and its lack of regulation and potential to spread misinformation. My research aimed to study the relationship between text-based artificial intelligence programs and voter behavior while monitoring the 2024 United States presidential campaigns. Based on literature and other research conducted, I expected the responses to reveal certain political biases when informing users. To test this relationship, I gathered a random sample of twenty participants in a controlled setting to measure their political views on salient issues of the campaign before and after using ChatGPT through two Likert scale surveys. In between both surveys, participants were each given a booklet with both presidential candidate's stances on each issue according to ChatGPT. A reading comprehension quiz followed the second survey to incentivize participants to read the booklet. The experiment yielded three results: respondents who follow politics loosely were swayed by ChatGPT, ChatGPT polarized respondents with strong political beliefs, and the language used by ChatGPT tended to favor Joe Biden more than Donald Trump. This research strives to illuminate the biases of artificial intelligence to prevent the spread of misinformation and political polarization.

62. Does Media Usage Predict Support for Political Violence?

Presenter(s): Christopher Rose

Advisor(s): Dr. Ann Gordon

We live in an age that is filled with technology, media, and news coverage. We are exposed to things that may anger us and lead us to do things with our pre-existing beliefs that we might not have done without this exposure. In this paper, I examine how social media usage correlates to support for acts of violence for political gain. I am exploring this data by using The Chapman Survey of American Fears, a nationally representative sample of adults in the U.S. (CSAF) Wave 10 data set to look at social media users and how they respond to certain questions about political

violence. I expect to find that people who use social media and other media sites or spend more time on the internet more often will be more accepting of violence for political reasons than those who do not view these media sources as often. In addition, I consider demographic characteristics and other attitudes that predict support for political violence, such as instances of uprisings, protests, and civil unrest and the media has had a crucial role in these events. The widespread access to media is the reason people are more exposed to what is going on in the world and would like to make a difference. However, extremists online will influence viewers to use violence to gain a political advantage. Media expresses the need for violence in political matters, and those who view that media will follow suit. With that in mind, this project will be able to explain potential factors of growing political violence in the United States.

63. Religious Beliefs and Political Violence: Examining the Paradox of Conservative Support for Violent Political Action

Presenter(s): Connor Moses

Advisor(s): Dr. Ann Gordon

Religion emphasizes values such as peace, cooperation, and mutual respect within society, ideals that are generally seen as opposing the justification or acceptance of violence. However, despite these inherent peaceful values, this paper explores the intersection of religion, political violence, and ideological beliefs. The research utilizes survey data to examine how religious affiliation and political beliefs influence individuals' views on the use of violence in political contexts. The findings indicate that while conservatives are more likely to practice religion compared to liberals, they are also more likely to support the use of political violence, particularly when it is seen as a necessary means to restore political leadership or address perceived governmental injustices. In contrast, liberals and centrists show significantly lower levels of support for such violence, suggesting a clear ideological divide on this issue. This paradox raises important questions about the influence of ideological and religious factors on attitudes toward political violence, particularly how the blending of conservative religious values and political rhetoric might shape public opinion and political discourse. Ultimately this study aims to explore the relationship between conservative religious values and political ideologies, focusing on how these factors shape support for political violence and their broader implications for democratic principles.

64. The Not-So-Silent Fourth Branch: Media's Impact on Voter's Trust in the Government

Presenter(s): Emily Kinney

Advisor(s): Dr. Ann Gordon

In a democracy, trust is essential to the function of government; voters must trust that their vote holds value, that those they elect are working in their best interests, and that the government cares about their well-being. This trust in government, however, is at an all-time low, risking the very foundation of American democracy. Using the 2020 American National Election Survey and the Chapman Survey of American Fears, representative national samples of U.S. adults, this paper aims to determine how different types of media, such as various outlets and social sites, impact American's fear of the government, measured using a variety of scales like fear of corrupt

government officials, fear of fraudulent election results, and overall distrust of the government itself. Current literature highlights the relationship between echo chambers and the beliefs about government held by those in said chambers, and this paper uses regression analysis and crosstabs to determine if specific factors such as CNN vs. FOX news consumption, time on X/Twitter, or contact with print newspapers increase or decrease a respondent's fear of the government. I expect to find that the more time a respondent spends on non-mainstream news channels and on "fringe" social media, engaging with those who hold viewpoints similar to their own, the more likely they are to distrust the government, no matter their party affiliation. As media moves further away from serving the public and towards serving their bottom lines, it is essential to understand media's ever-growing impact on our faith in democratic systems.

65. Exploring the Association of Age and Ethnicity in Shaping Fear of Police Misconduct: A Comprehensive Analysis

Presenter(s): Karina Perez Magana

Advisor(s): Dr. Ann Gordon

This research project examines the relationship between race and age and how they contribute to police brutality. I aim to illuminate how these variables can influence each participant's encounter with law enforcement. Negative encounters such as racial profiling, investigatory stops, and unwarranted arrests. Existing literature and studies have been proven to show the excessive amount of police misconduct reports nationwide such as "How Does the Public Explain Police Misconduct? Race, Politics and Attributions" by Amanda Graham, Justin T Pickett, and Francis T Cullen; however in this study, I will be diving deep into the identifying process of the victims of police misconduct to determine how many have a similar race and if they are bound in the same age group. This study combines a mixed methodology of surveys and testimonies of people who have experienced any misconduct from law enforcement. I hypothesize that people of color, such as African Americans and Latinos, 18-30 years old will have a large majority of being at the hands of misconduct by law enforcement. Furthermore, the data collection will also reflect the psychological impact of victims of police brutality or negative encounters with law enforcement. I believe that being African American or Latino and between the ages of 18 and 30 can heighten your likeliness of having a negative encounter with law enforcement. By integrating statistical analysis with lived experiences, I hope to shed light on a problem and fight for better police reformation in the near future to avoid police misconduct for all citizens.

66. The Impact of Media Framing on Public Perception Among Politically Disengaged Individuals During Political Scandals.

Presenter(s): Nicki Son

Advisor(s): Dr. Ann Gordon

In the realm of politicians, reputation and trust built with citizens are essential to maintain their positions and foster a sense of democracy. However, as partisan individuals tend to have focused party affiliations they stand for, some individuals are disengaged or even disinterested in political issues. This made me wonder when encountering major political scandals such as the "Watergate

Scandal”, “Clinton-Lewinsky Scandal, and “Trump Ukraine Impeachment Scandal” may change their level of attention to politics and what that influencing factor may be. Going through the survey questions from the American National Election Studies (ANES) on trust in government and media, along with one’s attention to political news, triggered further research to examining how mass media spotlight of politics during times of the stated scandals, may affect the political perception of apolitical individuals and how media framing can come into place. This research focuses on a methodology that combines content analysis to measure how these scandals were portrayed in past media sources and surveys to identify the politically disengaged individuals and have that pool of people answer questions on their media consumption habits, trust in media, as well as their perception towards the focused scandals. Overall, I hope to have my research identify the correlation between media framing and politically disengaged individuals, contributing to emphasizing the significance of media usage and how we must be critical when utilizing such sources to formulate a political opinion or standing.

67. Broadcasting Fear: The Role of Fox News and Social Media in Terrorism Perceptions**Presenter(s):** Tai Wittenberg**Advisor(s):** Dr. Ann Gordon

Media consumption plays a fundamentally crucial role in our view of terrorism, which often amplifies that fear beyond the actual statistical likelihood of an attack. This study looks at the relationship between an individual's media usage habits and their fear of terrorism, focusing specifically on the effects of social media and differing partisan news sources. This study hypothesizes that people relying heavily on social media for news are likelier to fear terrorism because of exposure to sensationalized and/or unverified content. Additionally, viewers of Fox News may show higher fear levels, given the network's frequent coverage of terrorism-related topics and the constant framing of security threats. This research uses Chapman University's Fear Survey data analysis to examine how different media platforms add to fear formation. Understanding these patterns is essential, as inflated terrorism fears can influence public policy, civil liberties, and national security strategies. This study aims to provide insights into the broader implications of news consumption on public anxiety and policy preferences by identifying key media-driven factors that shape perceptions of threat.

68. Volatile Landscape: How Political Identification, Social Media, and Gender Shape Perceptions Towards Civil Unrest**Presenter(s):** Tyler Cappon**Advisor(s):** Dr. Ann Gordan

In this research paper I examine the fear of Civil unrest in major cities. I would like to address the question of how certain geographic areas of focus and certain demographics experience civil unrest. Relying on American National Election Studies, Surveys can lead us to conclude that civil unrest can be attributed to several factors such as geographic location, people's party identification, whether or not they get their news from social media, and gender impact their fear of Civil unrest. Through analysis we can see how internal threats jeopardize the safety and

security of people in the US as well as other countries. How people navigate through Civil unrest can be demonstrated through protests, legal reform, and social media. I expect that people will be more in fear of civil unrest in urban dwellers than rural populations, democrats will fear more than republicans, and people who get their news from social media will be less likely to fear civil unrest. A root cause of unrest, as described by William Navas, is that the burden of power is having to wield it. This supports the underlying message that the social landscape is changing. Findings include that urban dwellers are less likely to fear civil unrest, republicans fear civil unrest and view protests as violent and people who get their news from social media find themselves not very fearful of civil unrest, upholding our hypothesis. In this day and age, protests can help shape our political landscape by voicing opinions of disapproval. In this research paper I will examine how party registration, income, race, and party identification will have an impact on whether or not protestors are violent or nonviolent.

69. Trust the Science? Media Usage and Climate Change Denial**Presenter(s):** Zoe Parker**Advisor(s):** Dr. Ann Gordon

With the rise of online news platforms and social media, there are now more means of obtaining information on the climate than ever before. In this paper I examine how the sources we use impact our belief in climate change, taking into account various news sources and social media platforms, as well as the creation of echo-chambers. Using the Chapman Survey of American Fears, a representative national sample of U.S. adults, I will compare media usage to the fear of climate change and trust in scientific experts. Many studies focus on the link between social media and activism, however I intend to fill in the gap when it comes to knowledge and belief about climate change. My research finds that those who get news from social media every day are significantly more afraid of climate change than those who never use social media. Additionally, those who use major outlets like CNN, New York Times, and Wall Street Journal believe in climate change much more than those who watch Fox News or listen to talk radio. This research will provide us with the basis of how to better educate the public about climate change and will show us how so many people have been led astray in their beliefs.

70. The Influence of News Media on Public Opinion Toward Student Loan Policy**Presenter(s):** Connor Krock**Advisor(s):** Dr. Gokcen Coskuner-Balli

This study investigates the role of news media in shaping public opinion on student loan policy, with particular attention to how political orientation influences public sentiment. Amid rising national debate over student loan forgiveness and growing media polarization, understanding how news narratives frame this issue is essential to informing both policy design and public discourse.

Using a dataset of video transcripts and comments from a range of mainstream and partisan news outlets, the research applies a mixed-methods approach, combining content analysis with sentiment analysis to assess how different media sources portray student loans and related policy

proposals. Sources were categorized by ideological leaning and then compared to their respective comment sections to check for any correlation in language and sentiment analysis.

The findings indicate clear differences in framing: conservative-leaning outlets tended to emphasize personal responsibility and debt avoidance while liberal-leaning sources were more likely to highlight systemic inequality and the burden of debt on young people. These framing strategies were reflected in audience responses, suggesting that news coverage not only reflects but potentially reinforces partisan divisions on the issue.

By illustrating the relationship between media narratives and public attitudes, this study contributes to ongoing discussions in media studies, political communication, and education policy. It underscores the importance of media literacy and critical consumption of news in shaping informed civic engagement around complex financial and social issues.

71. Religiosity and Voter Turnout in the United States

Presenter(s): Abigail Cook

Advisor(s): Dr. Lewis Luartz

How does religious affiliation affect voter turnout in the United States? Voter turnout is a crucial indicator of participation, reflecting citizens' civic engagement with political participation. It is crucial to understand the factors that influence voter voter turnout. It is essential to identify barriers and opportunities to enhance participation in the United States. Religion has been a powerful influencer in individual values in the United States. Specifically pushing people to live in the way their religion says is right. Despite its potential influence, previous studies have examined the role of religiosity, focusing on ideological factors, party alignment, or influence of endorsements rather than a direct connection to voter turnout. This research question aims to look at how different religious affiliations might affect the likelihood of people coming out to vote. I argue that there will be a positive relationship here between religion and politics. There is a weak negative correlation between religiosity and voter turnout in the United States. This might be because different variables, like party identification, could play a more significant role in voter turnout. The regression table during the presentation will clearly explain why this negative correlation works using the OLS function since the variables being tested are continuous. By studying these variables, political scientists can better understand how religious dynamics influence political behavior in the United States.

72. Voter Perceptions and Preferences

Presenter(s): Emily Tolli

Advisor(s): Dr. Lewis Luartz

Voter preferences during elections are predominantly dependent upon how candidates are perceived. Those perceptions, however, will vary upon the different policy issues the party's adopt. In terms of abortion policies, the Democratic party is perceived to hold dominance over positive abortion platforms. For this reason, I expect the relationship between the Democratic party and voters to be that voters who are in favor of positive abortion policies will vote for Democratic candidates because they are more likely to have positive abortion policies. I used the

ANES2020 Timeseries to discuss the relationships between voter perception and voter choice in the 2020 U.S. Presidential election. With the use of R coding and logistical regression, I found that there is evidence to suggest that as you move from a stance of abortion permitted in only some cases to abortion in most cases, the probability of voters voting for the Democratic candidate increases. This exists across both Democratic and Republican categories. However - it's important to note that as abortion rhetoric turns most permissive and unrestrictive, the chances of voting Democratic, across both party platforms, decreases. These trends may be attributed to other factors such as gender, race, and age. Nonetheless, it is important to study these trends to ensure voters are accurately represented in how they want policies to be written and advocated for.

73. Examining Partisan Media and Voter Choice in the 2020 U.S. Presidential Election**Presenter(s):** Hannah Fox**Advisor(s):** Dr. Lewis Luartz

This study examines whether the partisan media that voters consume significantly influenced their vote in the 2020 U.S. Presidential Election. The study tests the hypothesis that individuals who frequently engaged with left-leaning media such as CNN were more likely to vote for Joe Biden, while voters consuming right-leaning media like FOX were more likely to vote for Donald Trump. This research contributes to a broader discussion of how different political, social, and economic factors influence voters' choices. Understanding the intersections between these ideas can provide deeper insights into various influencers in the outcomes of major elections as well as broader political dynamics in the United States. While partisan media may play a significant role in shaping political preferences, additional factors such as personal ideology, life experiences, economic conditions, and social environments are likely to be crucial factors in the decision as well. Using data from the 2020 ANES (American National Election Studies) Time Series, this study analyzes the strength of the relationship between media consumption and vote choice. A logistic regression analysis assesses the likelihood of voting for Joe Biden versus Donald Trump based on respondents' self-reported frequency of visits to popular news websites. Results revealed that respondents who regularly visited CNN but not FOX were over 900% more likely to vote for Joe Biden, and those who recorded visiting FOX but not CNN were approximately 91.4% more likely to vote for Trump over Biden. Interestingly, those who recorded visiting both CNN and FOX regularly showed no statistical significance, indicating that cross-partisan media exposure may lead to more moderate voting behavior. Results highlight the influence of partisan media in voter decision making and the need for further research on media consumption, voter choices, and other variables to continue developing an understanding of broader political ideas.

74. The Role Social Media News Consumption Plays in Increasing Support for Alternative für Deutschland among German Males**Presenter(s):** Jackson Campbell**Advisor(s):** Dr. Lewis Luartz

To what extent does the growing reliance on social media as a news source among male voters in Germany influence the increasing support for the Alternative für Deutschland (AfD)? Existing

literature on the rise of right-wing populism highlights the role of traditional media and economic discontent, but often overlooks how this medium specifically influences support for far-right support among male voters, despite its growing role as a primary news source. This gap limits our understanding of how digital news consumption drives electoral shifts in contemporary democracies. I argue that social media use for political information significantly increases the likelihood of supporting AfD, with male voters being particularly susceptible to this influence. Using the GLES 2021 Cross Sectional Data Set, I employed a logistic regression to analyze the relationship between social media use for political information and AfD support, while controlling for gender. The logistic regression reveals that people using social media for political information have 1.799 higher odds of supporting AfD ($p < 0.001$), while males have 1.623 times higher odds than females ($p < 0.01$). A spearman correlation further confirms this positive association ($\rho = 0.12$, $p < 0.001$), highlighting social media's contribution to AfD support, especially among male voters. Such findings underscore the role social media plays in amplifying far-right support in a digital platform that bypasses traditional media gatekeepers. This emphasizes the need for political scientists to further explore social media's impact on electoral dynamics, both in Germany as well as western democracies writ large.

75. Immigration and the Political Right**Presenter(s):** Matt Cristol**Advisor(s):** Dr. Lewis Luartz

How do perceptions of immigration influence support for right-wing ideology? In the current literature, political scientists propose a relationship between immigration and the expansion of immigration policies. Scholars, particularly in Europe are interested in examining the connection between immigration and the rise of right-wing ideologies in increasingly diverse communities. These two variables appear to be inversely related. As immigration increases, support for left-wing ideologies tends to decline in European societies. Recently, right wing ideology has led to mistrust in society, particularly towards immigrants who are blamed for societal problems and used as a scapegoat for many economic problems. Thus, voters have tended to lean toward the right, expressing a desire for more restrictive immigration policies. In this paper, I argue that immigration in the 21st century, driven by factors such as civil rights, safety concerns and asylum seekers has contributed to the spread of right-wing ideologies among voters in Europe. To test this hypothesis, I analyzed data from the European Parliament Election Study from 2024 using logistic regression. The findings suggest that individuals who favor stricter immigration policies tend to position themselves further to the right on the political spectrum. This means that shifting from support for more restrictive policies to less restrictive ones reduce the odds (or decreases the likelihood) of identifying with the ideological right.

76. Analyzing the Voter Behavior of Second-Generation Americans in the 2020 Presidential Election**Presenter(s):** Olivia Sacco**Advisor(s):** Dr. Lewis Luartz

What was the voter behavior of second-generation individuals and how did it impact overall voter choice in the 2020 Presidential Election? The research surrounding this issue suggests a strong relationship between immigrants and their support for the Democratic Party. However, it often neglects the political behavior of their children, the second-generation. Immigration and its generational effects on political behavior is both a fascinating and increasingly critical phenomena to understand. By studying a presidential election like that of 2020, I aim to establish the second generation's preference towards the Democratic Party and its candidate, Joe Biden. Using the American National Election Studies (ANES) 2020 Dataset and logistic regression, I explored the relationship between the status of an individual as second-generation and voting behavior. My findings suggested a strong correlation between one's status as a child of immigrants and their support for a Democratic candidate. This provides an important concept about the voting behavior of this demographic, especially as they become a larger portion of the national electorate. By understanding this behavior, we can better predict or challenge future political conceptions about this group.

77. Government Trust and Its Influence on Voter Turnout during Wartime**Presenter(s):** Samantha Richard**Advisor(s):** Dr. Lewis Luartz

What impact does the public's level of trust in government during wartime have on voter turnout in US elections? Previous research focuses primarily on the impact public trust has on political parties and tends to neglect the impact wartimes may have on these factors. I will argue that during wartime, there is a negative relationship between public trust and voter turnout. Oftentimes, those who find themselves not trusting the government have a stronger desire to vote in hopes of changing the system; in comparison to those who have a high level of government trust, they feel a weaker desire to vote as they trust the current government system to do what's right. War often heightens these feelings of approval and disapproval of candidates, which can potentially explain these patterns in voter turnout. To explore this, I analyze the 1996 and 2008 American National Election Studies post-election datasets to compare the relationship between voter turnout and public trust during wartime and "peacetime." The logistic regression showed no statistically significant evidence of war significantly impacting people's trust in government and their likelihood to participate in forms of democracy like voting. Alternatively, I explored the impact interest in public affairs would have on the relationship between government trust and voter turnout. This logistic regression revealed that for both years, as interest in public affairs increased, the odds of voting in that year's election also increased. However, in 1996, the "peacetime" year, the increase was more significant, possibly pointing to the idea that the various challenges international conflict poses can deter individuals from participating in democracy and taking an interest in government processes. Overall, this can suggest that the reasonings behind

political engagement and interest are multifaceted, and the more factors citizens have to worry about, specifically during wartime, can push them further away from politics.

78. To What Extent Do Ideological Extremism and Trust in Media Sources Shape Beliefs About Election Fraud and Partisanship?

Presenter(s): Victoria Kilgour, Cassie Clate

Advisor(s): Dr. Lewis Luartz

Individuals who lack trust in mainstream media tend to reject new information from well-established sources and instead seek out biased outlets that reinforce their existing beliefs, contributing to ideological polarization. This dynamic is especially dangerous as extremist groups target and exploit vulnerable populations "particularly the youth" by promoting unreliable narratives that encourage selective news consumption and deepen the political divide. This paper argues that political extremism and low trust in mainstream media significantly increase individuals' belief in election fraud and deepen partisan affiliation, leading people to reject credible information in favor of biased narratives that double down on their preexisting beliefs. We conducted a quantitative analysis using data from the ANES 2020 Time Series Study using an independent variable, how much trust and confidence individuals have when it comes to reporting the news fully and accurately, and a dependent variable, partisan affiliation. The findings suggest that media trust does not, for the most part, alter party identification but appears to reduce polarization in how people see political realities; extremist groups will often deepen the divide between parties by exploiting information, villainizing opposing sides, and encouraging distrust to better spread their ideologies. This pattern highlights how media distrust fuels selectivity to information, reinforcing harmful biases and contributing to greater political polarization and susceptibility to misinformation. These findings reinforce the idea that media trust and ideological extremism are central drivers of misinformation and political polarization in democracies.

Psychology

79. Assessing whether Leakage in Evidence Accumulation is Necessary to Account for Human Perceptual Decision Making

Presenter(s): Erin Schmidtke

Advisor(s): Dr. Aaron Schurger

Human perceptual decision making can be described using accumulation of sensory evidence to a threshold, referred to as an accumulation-to-bound or drift-diffusion model (DDM). The accumulated evidence is called the "decision variable". A variant of this model, called a leaky stochastic accumulator (LSA) incorporates leakage into the model, such that the decision variable decays back to zero if the sensory evidence is no longer present. The LSA is considered to be more biologically realistic, even though the simpler DDM model can account for behavioral data quite well. This study is aimed at asking whether there may be specific conditions under which

behavioral data cannot be explained without including leakage in the model. We test this using a novel dynamic noise stimulus: We start with a square field of random noise, where each pixel is randomly either black or white. Then a visual object (in this case a Gabor pattern) is used to modulate the probability of each pixel being either black or white using error-diffusion dither. A series of such noise frames is presented at different frame rates, from one image per second to 15 images per second. At faster frame rates the visual object becomes visible, even though it is only present in the statistics of the series of frames as it evolves over time. At slower frame rates, the visual object is no longer visible, even though the total amount of evidence is the same (it just takes longer to present it). This effect of the frame rate on behavior cannot be explained without invoking leakage, thus proving that leakage is necessary to account for human perceptual decision making.

80. Connection Beyond Coupledness: Do Single Men with Experience in Consensual Non-Monogamy Report Less Loneliness than Those Without Experience?

Presenter(s): Bryan Jordan

Advisor(s): Dr. Amy Moors

Background: While loneliness is a common experience, research suggests that men may be uniquely affected because of often masculine ideals (Berke, Reidy, & Zeichner, 2018). People in consensually non-monogamous (CNM) relationships commonly highlight relationship benefits like shared experiences and social connection (Moors et al., 2017). To better understand how relationship structure shapes men's connection and loneliness, we examined the experiences of men with and without prior engagement in CNM. Method: Survey data were drawn from a U.S. Census-based quota sample of 747 men with experience in polyamorous, swinging, or open relationships, and 1,431 men with no such experience (total N = 5,035). Participants answered four items measuring meaningful social interactions, using a 5-point Likert scale (1 = Never, 5 = Very Often), including in-person interactions, phone/internet interactions, conversations with dating partners, and in-person dates. Participants also reported on how loneliness positively, negatively, or does not impact their friendships, dating/romantic life, and sex life. Results: Men with CNM experience reported significantly more frequent meaningful in-person social interactions, phone or internet interactions, conversations with dating partners, and in-person dates compared to men without CNM experience (t-range = 2.88–15.67, all p values < .01). Additionally, men with CNM experience were more likely than monogamous men to report that feeling lonely positively impacted their friendships, dating/romantic lives, and sex lives (χ^2 range = 135–161, all p values < .001). Conclusion: Research suggests when men challenge restrictive masculine norms, they may become better equipped to cultivate emotional connection and reduce loneliness, an experience potentially fostered through participation in CNM (Nordin et al., 2024). These findings may highlight the importance of community and alternative relationship structures as an additional benefit for men who practice CNM.

81. Upset Over Sexual Versus Emotional Infidelity in Hypothetical Scenarios and Actual Experiences: A Replication and Extension with New Measures

Presenter(s): Anna Young, Kaylee Campana

Advisor(s): Dr. David Frederick

Infidelity is common in relationships and contributes to emotional distress (Betzig, 1989). Degree of upset over sexual versus emotional infidelity has been of strong interest to sociocultural and evolutionary theorists, but controversy exists on whether there are gender differences in these feelings (Buss et al., 1992; Harris, 2003; Sagarin et al., 2012). We improved on existing studies by creating new scenarios and merging the strengths of forced choice and continuous measures of upset over infidelity by creating a forced choice measure with intensity ratings incorporated into them. Our approach revealed the traditional sex differences on all four scenarios (all $ps < .001$; $ds = .38-.42$). Men were more likely than women to indicate that sexual infidelity was "much more" upsetting, and women were more likely to indicate that emotional infidelity was "much more" upsetting (all $ps < .05$). The findings provide new insights into the existence of gender differences in jealousy and in the intensity of this jealousy.

82. The Hope in Coping: Coping Flexibility Was Associated with Higher Sexual and Relationship Satisfaction Among Partnered U.S. Adults.

Presenter(s): Elliot Mathis

Advisor(s): Dr. David Frederick

Poor mental health can have a vast range of negative consequences for romantic relationships. Individuals with a greater ability to halt an ineffective coping strategy and implement an alternative coping strategy, or coping flexibility, generally report better overall mental health. The current study of 2217 participants living with their partner tested coping flexibility's association with reduced conflict and mental health during a period of acute stress, and whether these factors were related to greater relationship and sexual satisfaction. Participants reported relationship satisfaction (CSI), sexual satisfaction, coping strategies (BRIEF-COPE), anxiety (GAD7), depression (PHQ9), relationship conflict (HSPS), and coping flexibility (CFS). Consistent with our hypotheses, those with more flexible coping strategies report higher relationship satisfaction ($r = .17$) and sexual satisfaction ($r = .20$), and lower relationship conflict ($r = -.07$), depression ($r = -.21$), and anxiety ($r = .26$). These findings highlight connections between one's mental coping ability and satisfaction in their relationship. Enhancing coping skills could lead to improved relationship functioning.

83. Internalized Racism and Inauthenticity as Predictors of Depression and Anxiety Among Asian Americans

Presenter(s): Vivian Nguyen

Advisor(s): Dr. David Frederick

Minority stress theory (Meyer, 2003) posits that people from marginalized or minority groups face unique group-specific stressors, including prejudice and discrimination. When individuals experience racism, they may internalize the racism and develop negative views of their own racial

in-group. While Asian Americans have long faced racial discrimination, we saw a 150% spike in Asian American hate crimes during COVID-19, which may have increased internalized racism among Asian Americans (Wong-Padoongpatt et al., 2022). Internalized racism may be associated with greater inauthenticity, or being easily swayed by others, as minorities feel the need to give in to racial pressures to assimilate and avoid further discrimination. While past studies have linked internalized racism and inauthenticity to negative mental health implications, there is limited Asian American representation in such research. The purpose of our study was to examine the link between internalized racism and inauthenticity, as well as how both may predict depression and anxiety in Asian Americans. We tested these associations among 647 Asian Americans via an online survey collected from an internet panel. The survey included an internalized racism scale for Asian Americans, a modified version of the Authentic External Influence Scale, and the Patient Health Questionnaire-9 (PHQ-9) to assess depression. People higher in internalized racism reported greater inauthenticity ($r=0.245$). Both internalized racism and inauthenticity were positively correlated with depression and anxiety. These results underscored how understanding racial stressors is key to developing culturally competent and successful therapeutic interventions for the Asian American community.

84. Cultural Self-Harm Differences

Presenter(s): Erin Simmons

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

This study is based on the evident cultural differences in self-harm behaviors and what those behaviors look like specifically for individuals that identify as Black or African American. Previous literature suggests that cultural differences in self-harm exist but very little research centers Black experiences and their connection to self-harm. Self-harm is considered a broad term, and it encompasses a variety of behaviors, some more common than others, but these common behaviors are typically exclusively explored within only a few demographics with a low Black participant pool. This contributes to the assumed lack of self-harm among the Black community but through the lens of culture, self-harm behaviors may be present differently for individuals of color. Exploring this topic will support mental health professionals better identify and acknowledge self-harm as it uniquely appears for Black clients. This will reframe how self-harm is currently viewed for Black clients and can aid in the identification and treatment for various mental illnesses for Black clients. This study will also contribute to a large gap in research and general mental health support for individuals that identify as Black or African American. Assuming these hypotheses are correct, it is important to inform Black communities on behaviors that are considered self-harm but currently may not be viewed as such and what those behaviors may signify about one's life and mental health/ behavioral health needs. This will support individuals in seeking care when identifying these behaviors within themselves and generally positively benefit the Black community.

85. How Does Social Media Influence the Voting Behavior of College-Aged Adults**Presenter(s):** Georgia Cargile**Advisor(s):** Dr. Desiree Crevecoeur-MacPhail

Voter turnout among young, college-aged adults is significantly lower than the voter turnout in older age groups. In the 2020 U.S. Presidential election, an estimated 50% of individuals aged 18-29 voted, an increase from the 39% turnout in 2016 (Tufts University, 2021). This trend suggests increasing engagement; however, young adults continue underutilizing their political power. Young people are the future leaders and decision-makers of the world; their participation in elections is crucial in creating policies that reflect their concerns and interests. Despite the increasing accessibility of voter registration and political information, many young adults remain disengaged from the electoral process. Social media plays such a dominant role in daily life that examining its influence on political engagement is vital, especially among young people. Platforms like Instagram, TikTok, Snapchat, Facebook, and Twitter serve as sources for news and political events, especially for young people. Understanding how exposure to political content on these platforms affects voting behavior is essential. This study seeks to determine the relationship between social media presence and voter participation among young adults, investigating whether digital political engagement translates into real-world electoral involvement. This study used a survey to collect data, which was then analyzed using a T-test to determine statistical significance. By evaluating how social media fosters political awareness, encourages voter registration, and motivates young people to participate in elections, this research seeks to give insight into the effectiveness of social media as a tool for political mobilization. Additionally, it aims to offer recommendations for increasing youth voter engagement in future elections, highlighting strategies that policymakers, educators, and advocacy groups can implement to enhance civic participation among young voters.

86. Influences of Ideal Body Image on Women's Impression Management on Social Media**Presenter(s):** Nicole Teav**Advisor(s):** Dr. Desiree Crevecoeur-MacPhail

Despite the progress modern society has made in challenging traditional gender roles, many gender stereotypes continue to exert a strong influence on an individual's social experiences and relationships. Women in particular are often burdened with high expectations of their role in society. In response to this pressure, women tend to engage in impression management tactics to better align themselves with societal standards. Recent literature has proposed that gender stereotypes negatively impact how women perceive body image, often leading to internalized pressure to achieve the ideal body image. Within the past decade, social media has become a popular platform for social engagement and interactions. However, there is limited research on social media as a tool for impression management in women. Therefore, this study aimed to examine the influences of body image on women's impression management on social media. The study involved only female-identifying participants, over at least 18 years of age, recruited from the Chapman University undergraduate psychology pool or outside of Chapman University via a link to the online survey shared on Instagram. Participants completed an online survey to assess

appearance internalization, appearance comparison, and appearance pressure. The expectation is that women with higher social media usage and stronger internalization of body image ideals will engage more in impression management strategies on social media platforms. The implications of this study suggest that disclaimers should be utilized more often along with social media posts, especially ones relating to body image, to inform users that what they see may not always reflect real-life scenarios. This study also provides an incentive to integrate digital literacy education into school settings to reduce the risk of psychological distress in young users who are especially vulnerable to misinformation.

87. How Ideological Background Affects Consumption of and Attitudes Toward Pornography Amongst Women

Presenter(s): Roslyn Addy

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

Pornography is a notoriously male dominated field in consumption terms and as such, research regarding women's consumption of pornography is limited and often contains focus on men's consumption of pornography. The research conducted by Roslyn Addy and Dr. Desiree Crevecoeur-MacPhail intends to bring women in the pornography sphere as consumers rather than onlookers or subjects of pornography affected by male pornography users. Little is known about women's actual thoughts, feelings, and use of pornography which limits the market of pornography that targets women and limits real conversations about pornography between women. The researchers have found that ideology does predict pornography use. All women have an individualized ideology about pornography as a political topic that influences the way they use pornography, expect partners to use pornography, and expect other women to use pornography. Three types of ideological categories about pornography from Hald's (2014) handbook of sexuality and psychology, cluster the way that individual intends to or expects others to engage in pornography into aligning groups. By researching women's ideologies and porn consumption habits the researchers can identify which ideologies have certain use of pornography patterns to open the conversation to more pleasurable and consumable pornography designed for women. This research also intends to contribute to a sex positive rhetoric in research as the majority of the research referenced is about problematic use and frames pornography use as a bad habit in line with only one of the theoretical pornography ideologies.

88. Impact of Sleep on Women's Health

Presenter(s): Tatum Swanson

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

Men and women have distinct biological and physiological differences that affect how research is conducted and interpreted. In the early years of sleep research, most studies predominantly included men. Women are known to face more issues related to sleep disturbances and disorders compared to men. Research on the impact of sleep on women's health is crucial for improving their health and well-being, as sleep may have a greater influence on women than on men. While

significant research on women's sleep has been conducted over the past thirty years, much remains to be discovered.

This study examines the effect of sleep on women's health, emphasizing the distinct biological and physiological differences that contribute to sleep-related disorders and disturbances. Recent research indicates that the menstrual cycle significantly influences sleep patterns, highlighting a crucial link between sleep and vital biological processes such as menstruation and pregnancy. The stress response theory suggests that inadequate sleep raises cortisol levels, disproportionately affecting women who face higher rates of stress-related disorders.

This study presents three hypotheses: Women experiencing significant stress will report poorer sleep quality compared to their peers; Women with poor sleep quality will experience a lower quality of life; and Women who wake later in the day will report a lower quality of life than early risers. Additionally, the research explores the relationship between sleep duration, social jet lag, and mental well-being among female students, emphasizing that both short and long sleep durations are linked to increased mental health risks. The findings highlight the need for targeted sleep interventions to improve health and well-being among women, suggesting that addressing sleep disturbances could substantially enhance their overall quality of life.

89. Exploring Smoking Habits, Neighborhood Characteristics, and Polygenic Risk: Data Analysis Using The Health and Retirement Study

Presenter(s): Morgan Albert

Advisor(s): Dr. Jennifer Robinette Dr. Desiree Crevecoeur-MacPhail

Smoking is among the leading causes of death, necessitating the identification of individual and environmental risk factors. The study tested the hypotheses that both genetic risk and perceiving one's neighborhood as undesirable (i.e., that the neighborhood was less cohesive and more disordered) would increase smoking risk. An additional hypothesis was that these individual and neighborhood-level risk factors may synergistically increase smoking risk. Data from the Health Retirement Study, a racially/ethnically diverse sample of older U.S. adults, was utilized for this study. All but one hypothesis was supported within this study. Non-Hispanic White participants who perceived their neighborhoods as more cohesive were significantly less likely to smoke. Incidentally, the same association was not significant among non-Hispanic Black participants. These findings suggest that non-Hispanic White individuals benefit more from neighborhood cohesion than do non-Hispanic Black individuals and interventions aimed at increasing cohesion may be an effective strategy for preventing smoking in different neighborhood areas. Specifically, programs that include bonding and bridging interventions can be implemented to increase cohesion in diverse communities so that all benefit from mutual trust.

90. Leading and Following: Exploring the Impact of Mentorship on Collegiate Dancers

Presenter(s): Peyton Winsett

Advisor(s): Dr. Jessica Walker

This thesis explores the impact of mentorship on collegiate dancers' artistic identity, academic success, and career readiness within university dance programs. While mentorship is widely

acknowledged as a critical tool for personal and professional development in higher education, its specific influence within dance education remains under-researched. Drawing on psychological, educational, and artistic frameworks, this study investigates how mentor-mentee relationships support dancers in navigating the transition from structured training to professional practice. Through a comprehensive literature review, six empirical studies are analyzed to assess the psychological and professional outcomes of mentorship, including increased self-efficacy, emotional resilience, and identity formation. The findings reveal that mentorship enhances dancers' ability to articulate their artistic voices, persist through academic and emotional challenges, and build essential professional networks. However, the benefits of mentorship are shown to depend on the quality, consistency, and accessibility of the mentor relationship. This thesis concludes that intentional, inclusive, and well-structured mentorship programs are essential in preparing dancers for sustainable careers, and calls for future research into long-term outcomes and equitable mentorship practices in dance education.

91. Flourish and Student Loneliness: A Digital Positive Psychology Intervention

Presenter(s): Jess Savela-Gomez, Alex Kraft

Advisor(s): Dr. John Hunter

The Flourish app is an AI-powered proactive approach to mental health, using positive psychology interventions. This study investigates the role of Flourish in impacting loneliness in college students. We hypothesize that there will be a significant difference in loneliness between conditions, where those who use Flourish will report greater decreases in loneliness than those who are in the control condition. Furthermore, we hypothesize that gender will moderate this difference, where women experience a greater decrease in loneliness in comparison to other genders. Methods: We conducted a randomized control trial (RCT) with 486 college students. In this 6-week longitudinal study, participants were randomly assigned to either use the Flourish app twice weekly or receive no additional resources beyond existing institutional offerings. Participants (79% female; mean age = 20.34) completed assessments at four time points (weeks 0, 2, 4, and 6) using validated measures including the UCLA 3-item Loneliness Scale (Russell et al., 1980). A linear mixed-effects regression model was used to analyze the data. Results: Participants who were assigned to the Flourish condition reported greater reductions in loneliness ($B = -0.05$, $p = .038$) in comparison to participants in the control condition, which supports the hypothesis that the Flourish app reduces loneliness when compared to the control condition. Gender was also explored as a moderator, but did not significantly moderate this relationship. Conclusion: These findings suggest the possibility of virtual positive psychology interventions being beneficial for students who are experiencing loneliness, and potentially serving as an evidence-based mental health resource for university mental health initiatives. Future research is needed to test the long-term effectiveness of the digital positive psychology intervention.

92. Postpartum PTSD is linked to maternal exposure to unpredictability during childhood**Presenter(s):** Tatiana Rodriguez**Advisor(s):** Dr. Laura Glynn, Emily Sweiss**Background:**

Approximately 17% of mothers experience post-traumatic stress disorder (PTSD) symptoms after childbirth, with the greatest risk factor being negative childbirth experiences (Dekel et al., 2017). However, life-course risk factors for these symptoms are not well-understood. One risk factor for PTSD in other populations, such as combat veterans, is exposure to unpredictable environments in childhood (Spadoni et al., 2022). In this study, we aim to assess the role of exposure to childhood unpredictability in risk for maternal PTSD after a traumatic versus non-traumatic birth.

Methods:

Participants included 135 mothers (Mage = 32 years, SD = 5; 56% Latina). We used the Questionnaire of Unpredictability in Childhood (QUIC; total possible range = 0-38; M = 8.8, SD = 7.3) to measure exposure to unpredictability and the PTSD Checklist for Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (PCL-5; total possible range = 0-80; M = 6.9 SD = 9.1) to measure childbirth-related PTSD symptoms. Two researchers independently coded birthing narratives as non-traumatic (n = 88) and traumatic (n = 47) and discussed discrepancies to reach consensus. We employed multiple linear regression to test moderation effects of childhood unpredictability on the association between traumatic birth and PTSD symptoms.

Results:

Exposure to unpredictability ($\beta = 0.32$, $p < .001$) and birth trauma ($\beta = .18$, $p = .03$) were associated with higher severity of childbirth-related PTSD symptoms. Exposure to unpredictability moderated the association between traumatic birth and PTSD symptoms ($\beta = .31$, $p = .03$).

Conclusions:

Findings from this investigation can be implemented to identify mothers at greater risk of postpartum PTSD symptoms due to their childhood experiences of unpredictability and mobilize targeted support. These results expand the growing body of evidence for the importance of exposure to unpredictability as a risk factor for psychopathology across populations (Davis & Glynn, 2024; Spadoni et al., 2022).

Sociology**93. The Influence of Age on Encouragement of Technological Growth.****Presenter(s):** Veronica Farquhar**Advisor(s):** Dr. Ann Gordon

This generation has observed a dramatic and unprecedented increase in technological innovation throughout society. As this technology continues to expand and integrate itself into the daily life of individuals, public opinion is diversified, particularly across different age demographics in their response and overall comfort level with the revolutionary abilities of this new technology. This research identifies and develops a better understanding of the significant relationship between

age and societal acceptance of technological growth. By relying on existing research of representative samples of national U.S. adults' technological opinion through the Chapman University American Fears Survey, as well as including supplemental references to psychological research reports to provide contextual understanding of my data, this research establishes a comprehensive mixed method interpretation of age based technological fear. Overall, older demographics are increasingly more likely to fear technology than younger generations. This is presumably due to higher levels technological ignorance in older generations which contribute to anxiety about digital innovation. Technological advancement is a societal phenomenon that will only continue to expand and develop in relevance to the daily lives of citizens with time. This research highlights the current understanding of the need to address and understand why certain individuals may be fearful, and therefore hesitant to accept this change so that it can be effectively mitigated. By doing so, we can successfully institutionalize sustainable technological growth through the digital world, and therefore simultaneous growth in our collective society as well.

World Languages and Cultures

94. The American Dream Is Dead: A Social Identity Theory Analysis of The Brief Wondrous Life of Oscar Wao

Presenter(s): Jayne Bamis

Advisor(s): Dr. James Hirsch, Dr. Ian Romain

This research paper examines the myth of the American Dream, particularly in the context of immigrants. Using *The Brief Wondrous Life of Oscar Wao*, I analyze how Junot Diaz presents the American Dream through the experiences of a Dominican family living in Paterson, New Jersey. I explore how each character navigates and interacts with this idealized aspiration, employing the social identity theory of Henri Tajfel and John Turner. By analyzing the struggles of Oscar, Beli, Yunior, and Lola, this research situates their experiences within broader socio political and historical contexts, demonstrating how factors such as gender, class, and cultural identity shape their pursuit of success and belonging. This research contributes to discussions on immigrant narratives in American literature, highlighting the gap between the idealized promise of sense of freedom and the lived realities of marginalized communities. Methodologically, this paper employs literary analysis, focusing on character development, narrative structure, and thematic elements to assess how Diaz critiques the American Dream. Social Identity Theory posits that individuals categorize themselves and others into ingroups and outgroups, shaping behavior and perceptions based on group membership. This paper will use the social identity theory to examine how the characters in *The Brief Wondrous Life of Oscar Wao* struggle to belong in American society, ultimately revealing the collapse of the American Dream. The findings suggest that, regardless of individual effort or adaptation strategies, the American Dream remains an elusive myth for many immigrants, shaped more by systemic barriers than by personal ambition. This

paper ultimately underscores the limitations of assimilation and meritocracy in a society where structural inequalities persist.

95. La Comparaison Entre Les Systèmes Educatifs Français et Américain**Presenter(s):** Caroline Claudson**Advisor(s):** Dr. John Boitano

This thesis analyzes and compares the educational systems of France and the United States, focusing on how the educational structures, pedagogical approaches, and cultural values in France and America shape their educational experiences. The study aims to contribute to the understanding of how national educational systems reflect and reinforce societal priorities. We will first examine the structural differences between the French and American systems. France's educational system is highly centralized, with one ministry managing the standard curriculum. In contrast, the U.S. system is decentralized, with local school districts having significant authority over educational policies, creating variation throughout the country. This structural comparison will highlight the implications of centralization and decentralization on educational consistency and diversity. Next, we will analyze the teaching methods in both countries. French education emphasizes discipline, intellectual rigor, and teacher-centered instruction, with a focus on lectures, exams, and memorization. Conversely, American education promotes student-centered learning, creativity, and interactivity, such as group work and project-based learning. This section will reveal how educational philosophies shape classroom dynamics and student engagement. Lastly, the thesis will explore the cultural influences on education, particularly regarding funding and societal values. France's public education system reflects a commitment to equality and social mobility, while the U.S. system is shaped by individualism and diversity, leading to varied funding models and greater private sector involvement. This research will demonstrate that the differences in educational structures, teaching methods, and cultural contexts in France and the United States result in distinct educational experiences, offering insights into how education shapes and is shaped by national values.

96. The Cultural and Economic Impact of American Remakes of French Films and Their Effectiveness**Presenter(s):** Greta Cifarelli**Advisor(s):** Dr. John Boitano

This project will show how American remakes of French films became popularized and their impact on the global film industry. First, we will look at the political and societal relations between the French and Americans over the years to determine why Americans felt they needed to remake French films to accommodate their codes and censorship. In 1934, an American code, the Hays Code, was introduced. American films had to respect the conditions; however, French films did not. This code caused more remakes so American viewers could watch a more "appropriate" version of foreign films until the modern Motion Picture Association of America rating system abolished the code (Mazdon 14). Secondly, we will examine the differences between French films and English remakes. Some films have the same title, script, and characters but use another

central theme or different features. Film critic Barry Norman describes the remake as a film that Americans transpose and ruin. He says films lose their spirit, and a remake "has become plain, one-dimensional thrills" (Norman). Others argue that adapting a classic work brings a new audience to national culture (Mazdon 3). Finally, we'll analyze how Americans use successful ideas from foreign films, specifically French films, to ensure financial success. The use of intellectual property - buying the rights to a script or characters - minimizes risk for financiers because audiences are more likely to respond well to a "prescreened" film. American financiers see a foreign film with a good idea and think, "Why release a foreign original, they figure, when they can make much more money remaking it with American stars and to American tastes?" (Waxman).

97. The Life of Marie Curie and Her Impact on Feminism**Presenter(s):** Jamie Chin**Advisor(s):** Dr. John Boitano

Chemist Marie Curie had an incredible impact on the field of chemistry by discovering radium and polonium and being the first person to win two Nobel Prizes - one in physics and one in chemistry. Despite the extreme sexism that she faced as a female scientist, she still made a lasting impact in the chemistry and feminism through her accomplishments. Today, women make about half of the United States' workforce and 57 percent of college graduates, yet they remain underrepresented in STEM (science, technology, engineering, mathematics) fields. For this project, we investigated the influence of Marie Curie's life on feminism in her time, and its continued effects into the 21st century. Through an extensive review of peer-reviewed literature, we explored her personal life and scientific career, her growing role in the growing feminist movement during the 20th century, and the evolution of female representation in STEM. We hypothesize that she dismantled several systemic barriers in the sciences, paving the way for other women to enter these male-dominated spaces. However, it is evident that this misbalanced representation of women in fields of STEM still exists today, which highlights the need for continued efforts to support and retain women in scientific careers.

98. Fashioning France: From Couture to Culture – The Influence of French Fashion**Presenter(s):** Kaiden Quirk**Advisor(s):** Dr. John Boitano

French fashion is the worldwide symbol of elegance and refinement. For centuries, Paris has been the capital of fashion. What sets Parisian fashion apart is its perfect blend of tradition and innovation. The prominent fashion designers not only set the standards of global trends but also introduced ideas that revolutionized the industry—from ready-to-wear to haute couture. Paris, France, is the birthplace of haute couture and laid the foundation for what fashion is today. Although many countries value fashion, Paris, France, remains the epicenter for discovering world-renowned designers and iconic fashion figures. Haute couture was born in Paris in the mid-19th century, thanks to Charles Frederick Worth, who created the first fashion house offering bespoke clothing to the elite. Louis XIV, the Sun King, helped shape the country's fashion legacy

in Versailles, establishing France as the home of luxury and quality. Among the most famous fashion houses are Chanel, Dior, and Yves Saint Laurent, who have redefined the very meaning of luxury. Today, Paris Fashion Week, created by the fashion houses, is the most prestigious event in the fashion calendar, with designers from all over the world presenting their collections. Fashion is explored and admired in Paris. The Parisian style is simple, chic, and effortlessly elegant. It draws inspiration from everything around it. From impeccably tailored garments to timeless accessories, this style has become the epitome of French chic. It is not just about style: French designers have revolutionized the fashion world.

99. La Gastronomie Française**Presenter(s):** Kaiolu Mau**Advisor(s):** Dr. John Boitano

In France, food culture is of great importance. For the French, food culture represents tradition, art, and intimacy. French gastronomy is a way of expressing French culture and ideals through refined flavors, techniques, and presentations. French gastronomy is ubiquitous in the French-speaking world. Our study will demonstrate that French gastronomy influences French identity and global food traditions, affecting social norms, eating habits, and diets in the global food industry from the past to the present. First, we study gastronomy as an expression of French culture to understand its impact on the French-speaking world and foreign countries. On the other hand, we examine the development of French gastronomy to recognize the evolution of cultural traditions and practices. Finally, we will analyze French gastronomy in different French regions to understand the techniques and ingredients used throughout France.

100. The Portrayal and Analysis of Marie Antoinette's Influence in Fashion Through Film**Presenter(s):** Merlot Tunnell**Advisor(s):** Dr. John Boitano

When we think of the beginnings of fashion in our world, one name in particular stands out: that of Marie Antoinette. This name is associated with words like frivolity and frills, lace and luxury, sweets and delicacies. Her country of adaptation found her egotistical, and she revelled in the great arts of the world, despite the French Revolution of 1789 and the misery of the people around her. She was hated in her day, but today we idolize her impact on the fashion world. The impression she left is soaring in the media and the arts. Countless romance novels, paintings, and our favorite: movies. What is this obsession with Marie-Antoinette that we have as a society, and is it fair? Do we love her, or do we love the idea we've created of her? The character of Marie-Antoinette is easily identifiable. She's selfish, beautiful, indulgent and a fashion icon. The character we've described remains consistent in modern media, but her reputation fluctuates between misunderstood and outdated. Even so, one fact remains: she was a fashion visionary, and her influence helped shape the 18th century then and as we know it today. Some notable recent films that have played an important role in popular culture and feature Marie-Antoinette include: Sofia Coppola's Marie-Antoinette, Ridley Scott's Napoleon, Flaminia Mereu's Ma Reine,

Wednesday, May 7

9:30 – 11:00 AM

Poster Session 1

Sandhu Conference Center

Deborah Davis' *Marie Antoinette* (the show), Simon Schama's *Power of Art*, and Charles Shyer's *The Affair of the Necklace*. These films focus on fashion more than others, exaggerating or diminishing its influence on her life and the lives of others around her. We'll examine how her style is represented in each film, and the fictional creative freedom that some films have taken in their cinematic portrayal of this historic person.

Biochemistry and Molecular Biology

1. Abstract: Gene Expression Analysis for Different Prostate Cancer Stages

Presenter(s): Kirby Williams

Advisor(s): Dr. Hagop Atamian, Dr Marco Bisoffi, Dr. Hamidreza Montazeri Aliabadi

Prostate cancer is a leading cause of cancer death among men in the United States. Approximately 300,000 cases of prostate cancer lead to 35,000 annual deaths. There are limitations to biomarkers which indicate disease progression, as well as targeted drug therapies, both used to combat cases of prostate cancer. These limitations are particularly prevalent in intermediate-risk prostate cancer, defined by having a Gleason sum score of 7. This study hypothesizes that new biomarkers and potential therapeutic targets can be identified by a systematic study of gene expression profiles in different prostate cancer stages. Using whole-genome RNA sequencing in human prostate tissue samples analyzed using the GeoMx Digital Spatial Profiler (Nanostring), RNA expression data from 95 regions of interest across 24 tissue samples was collected. The integrated development environment, R-Studio, was used to identify differentially expressed genes in tissue samples of varying prostate cancer stages. These findings will be used to run a pathway enrichment analysis using a bioinformatic database such as Panther Pathway. The results are expected to show differences in gene expression levels between prostate cancer stages historically have been difficult to distinguish between. The findings could contribute to improved risk stratification and treatment strategies, forming a basis to help identify molecular targets to enhance treatment methods.

2. Confocal Microscopy Studies of Liquid-Liquid Phase Separation in Microgel-Collagen Composites

Presenter(s): Marion Harper, Elif Narbay, Abby Caine

Advisor(s): Dr. Andrew Lyon

The versatile and tunable properties of microgels give them a wide range of potential applications in engineering and medicine, among the most exciting of which is the modeling and synthetic mimicry of biological tissues and their unique properties. Microgel properties are tunable by environmental conditions such as temperature, light, pH, or the presence of chemical or mechanical stimuli, allowing them to both inform and respond to biological activity, both influencing the development of cells and being influenced by cellular activities. The extracellular matrix (ECM) comprises the basis of tissue structure and contains a complex network of protein structures, most notably collagen fibers. However, many questions remain regarding the growth and properties of these fibers within densely packed medium of the ECM. In this study, collagen networks were self-assembled within ultra-low crosslinked (ULC) poly(N-isopropylacrylamide) (pNiPAM) microgel pastes containing fluorescent dextran, simulating the crowded nature of the ECM and allowing the internal partitioning of water within the composite to be visualized. It has been previously demonstrated that in highly dense composites, the dextran polymers cluster near

the collagen fibers. Dextran is an inert, hydrophilic polysaccharide, which is excluded from the volume occupied by microgel particles and collagen fibers, causing it to partition to the collagen fibers, indicating a liquid-liquid phase separation between the water surrounding the fibers and those permeating the microgels. This result is investigated with fluorescence recovery after photobleaching (FRAP) analysis, which allows the diffusion rate of dextran to be determined by the time taken to repopulate a photobleached region of the sample with fluorescence dextran. This result has important implications for the modeling of the dynamics of crowded composite media such as the ECM, where dynamical properties such as molecular transport and cell response are highly dependent on the partitioning of water and internal phase separations.

3. Investigation of the Mechanical and Physical Properties of ULC Microgel Pastes

Presenter(s): Hatte Hamilton, Elif Narbay, Megan Hicks, Anne Marie Santich

Advisor(s): Dr. Andrew Lyon, Dr. Daniel Cardenas Vasquez

Soft colloidal particles have attracted interest due to their versatile applications in material science and bioengineering. Among these, ultra-low cross-linked (ULC) microgels represent a unique subclass characterized by their extreme softness. These particles exhibit unique properties such as high compressibility and responsiveness to stimuli like temperature and ion concentration. Our research focuses on colloidal assemblies of these ULC microgels, in the form of microgel pastes. Detailed investigations surrounding microgel pastes rheological properties, dissolution stability and internal structure were conducted using techniques such as rheometry and optical/atomic force microscopy. From these investigations, it's been revealed that the microgel paste's mechanical and swelling/dissolution properties are dependent upon the details of the softness of the colloidal building blocks, including their interactions, which are mediated by charge-compensating counterions. The research surrounding the physical and mechanical properties of this material is crucial to its implementation into different biological applications.

4. Rheological Insights into Microgel Behavior: Modeling Velocity Profiles and Flow Characteristics

Presenter(s): Megan Hicks

Advisor(s): Dr. Andrew Lyon, Dr. Ernesto Daniel Cardenas Vasquez

The velocity profile of a fluid is characteristic of most essential processes and is determined by factors such as flow geometry, the properties of the fluid itself, and the pressure it undergoes. Understanding microgels' physical principles and statistical relationships is crucial to the success and advancement of biomedical and pharmaceutical applications. Viscosity measurements across multiple temperatures (20°, 27°, 32°, and 37 ° C) and microgel concentrations (50, 100, and 150 mg/mL) in 100 mM NaCl and water allows for the determination of the velocity profile at each concentration. The experimental data obtained will be fitted to a Herschel-Bulkley model, an effective model for representing the behavior of a non-Newtonian fluid like microgels. The rheological analysis of microgels provided crucial insights into the concentration-dependent flow behavior and may aid in optimizing various biomedical applications such as drug delivery.

5. Methylation-Dependent Regulation of Histone H3 Phosphorylation by Aurora B Kinase: Insights from the ADP-Glo Assay

Presenter(s): Caroline Gluck

Advisor(s): Dr. Cecilia Lopez, Dr. Marco Bisoffi

Histone modifications play a critical role in regulating cell division, and disruptions in these processes are linked to diseases like cancer. This study investigates whether methylation of an arginine residue in histone H3 inhibits phosphorylation of a neighboring serine by Aurora B kinase. By examining how one modification affects the addition of another, this research contributes to our understanding of histone crosstalk and its role in cell cycle control.

Aurora B kinase is a key mitotic enzyme that phosphorylates target substrates to ensure proper chromosome segregation. To measure its activity, we validated the ADP-Glo Kinase Assay, which detects ADP production as an indirect measure of kinase function. The assay first depletes residual ATP after the kinase reaction, then converts ADP back to ATP, which is detected via a luminescent signal proportional to kinase activity.

Reactions were assembled in a 96-well white Nunc plate with Aurora B kinase, histone substrates, ATP, and kinase buffer, and incubated at room temperature for 60 minutes before adding the ADP-Glo reagents. A standard curve was generated using serial dilutions of ADP and ATP to quantify ADP production. Luminescence was measured with a plate reader, and the data were analyzed to establish the relationship between ADP concentration and relative light units (RLU).

The results confirmed the assay's accuracy and sensitivity. A strong linear correlation between ADP concentration and luminescence validated reliable detection of kinase activity. Reactions with both Aurora B and histone H3 showed significantly elevated luminescence compared to controls lacking kinase, substrate, or ATP. Reactions with methylated histone H3 exhibited reduced luminescence, suggesting that arginine methylation may inhibit serine phosphorylation by Aurora B. These findings support the idea that specific histone modifications can regulate the addition of others, emphasizing the importance of histone crosstalk in mitotic control.

6. Investigating Arginine Methylation in Histone H3 as a Mechanism to Prevent Breast Cancer Metastasis

Presenter(s): Shaina Ambashta

Advisor(s): Dr. Cecilia Lopez

Epigenetic modifications of histone proteins regulate chromatin structure and gene expression during essential cellular processes such as mitosis. Among these, phosphorylation of histone H3 at serine 10 (H3S10ph)—primarily catalyzed by Aurora B kinase—is linked to chromatin condensation and transcriptional activation, and is frequently elevated in aggressive cancers like breast cancer. However, the regulatory impact of nearby post-translational modifications on this phosphorylation event remains poorly understood. This project explores the hypothesis that methylation of arginine 8 (H3R8), a residue adjacent to serine 10, may interfere with phosphorylation at H3S10. This hypothesis is grounded in prior evidence of post-translational modification crosstalk within the RKS motif of histone H3. To investigate this, we used a two-

pronged approach: molecular modeling of Aurora B binding to H3 peptides, and in vitro kinase reactions to experimentally assess phosphorylation levels under different modification states. Preliminary data suggest that dimethylation of H3R8 may reduce phosphorylation at H3S10. Molecular models support this possibility by showing predicted structural interference near the kinase binding site. These findings, while hypothetical, contribute to ongoing efforts to decode the histone modification landscape and offer a potential framework for understanding how epigenetic regulation can be disrupted in cancer.

7. The Effect of Curcumin and the Curcumin Analog ca27 on the Progesterone, Estrogen, and Androgen Receptors in Canine Osteosarcoma Cells

Presenter(s): Charlotte Waddell

Advisor(s): Dr. Marco Bisoffi

Osteosarcoma (OSA) is the most common primary bone tumor both in dogs and in humans, with dogs having an incidence rate 27 times higher than in humans, making it a good model for human disease. The nuclear hormone receptors and transcription factors, progesterone receptor (PR), estrogen receptor alpha (ER α), and androgen receptor (AR) potentially support tumor growth. In this project, the effect of the natural plant product curcumin and its diarylpentanoid ca27 on PR, ER α , and AR expression, was explored using the D-17 cell model derived from canine patients. Expression of the PR, ER α , and AR was determined by quantitative reverse transcriptase polymerase chain reaction (qRT-PCR), and by sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE) and chemiluminescent Western blotting. Our preliminary results indicate a robust expression of PR, but not ER α and AR, in D-17 cells and a repressive effect of ca27, but not curcumin, on PR expression. Our current experiments include detection of ER α and AR at the RNA level, dose-response testing for ca27, and studying the effect of progesterone on D-17 cell growth.

8. Elucidating a Link Between PRMT7 and p53 in Breast Cancer Cells.

Presenter(s): Evan Hughes, Molly Niswender

Advisor(s): Dr. Marco Bisoffi, Dr. Cecilia Zurita-Lopez

Protein Arginine Methyltransferase 7 (PRMT7) is the only member of the protein arginine methyltransferase protein family that monomethylates its protein substrates. PRMT7 is found in both the nucleus and cytoplasm of breast cells and is believed to play a robust role in the tumorigenesis and metastasis of breast cancer. The goal of this project is to uncover possible pathways for PRMT7 to promote cancer progression. A preliminary antibody array was performed to determine the regulation of known cancer-related proteins by PRMT7. An early-stage human breast cancer cell line, MCF-7, was transfected with plasmid pCDH1-hPRMT7-GFP to over-express PRMT7. Qualitative and quantitative analysis of detectable expression changes compared to sham transfection revealed a decrease in p53 expression, a protein not previously associated with PRMT7. Upon DNA damage, p53 can induce the expression of genes like p21, which inhibit cyclin-dependent kinases (CDKs) and halt the cell cycle. This pause allows the cell time to repair the DNA

damage before proceeding with division. Our current research aims at identifying the mechanisms of action by which PRMT7 regulates p53. For example, PRMT7 may monomethylate proteins directly implicated in the expression or activity of p53. Successful completion of this project will provide novel insights into how PRMT7 contributes to breast cancer progression.

Biological Sciences

9. Morphometrics of Hagfish Filaments

Presenter(s): Hannah Choi

Advisor(s): Dr. Douglas Fudge

Hagfish are benthic marine animals with unknown reproductive behavior and methods. Females deposit eggs characterized by unique anchor filaments at the poles of the main egg capsule, facilitating attachment. We conducted micro-CT scans on unfertilized eggs from several species to investigate the mechanics and morphology of hagfish egg structure and attachment. Using 3D Slicer software, we analyzed these scans to visualize and study the egg structures in detail. Additionally, we have been able to determine differences in filament caps across four species of hagfish through 3D Slicer scans. Our findings include observations on anchor filament diameter, filament stalk diameter, lobe count, filament count, and developmental photographs of the stages of filament growth, allowing the categorization of egg morphology traits across several different specimen.

10. Analyzing Microplastic Concentration in the Pacific Hagfish (*Eptatretus stoutii*)

Presenter(s): Miya Escalante, Ari Dedeoglu

Advisor(s): Dr. Douglas Fudge, Dr Andrew Lowe

Microplastics are plastics that have been degraded to be less than 5 mm in size and are contaminants with adverse effects on the physiology, health, and reproduction of marine life. Hagfish are deep-sea (benthic) scavengers that may uptake microplastics due in particular to two aspects of their lifestyle - burrowing in sediments and scavenging on animal carcasses. This study will analyze microplastic concentrations in different tissues of Pacific hagfish (*Eptatretus stoutii*). The gastrointestinal (GI) tract, contents of the GI tract, hearts, gills, muscle, eggs, viscera, and skin samples were digested using 20% potassium hydroxide (KOH) for one week in 60°C conditions. This was then filtered through microporous glass fiber filters. Images of the filters were taken using a microscope under normal light and Ultraviolet light, which makes microplastics fluoresce. The filters were analyzed for the presence of microplastic size, shape, color, and concentration. Preliminary results depict that there are more microfibers than microplastics in the samples. Additionally, the observed fibers varied in color, including blue, red, black, and translucent. This is one of the few studies that look at microplastics in benthic scavengers, which will aid in identifying how microplastics travel throughout trophic levels and the ecosystem.

11. Synthesis and Characterization of a Cytotoxic Intermediate MCC–Doxorubicin for EGFR-Targeted Peptide Conjugation**Presenter(s):** Keon Jafari**Advisor(s):** Dr. Kamaljit Kaur

Triple-negative breast cancer (TNBC) is one of the most aggressive and treatment-resistant breast cancer subtypes, primarily due to the absence of actionable molecular targets. However, Peptide–drug conjugates (PDCs) have emerged as a promising strategy to selectively deliver chemotherapeutic agents while minimizing off-target toxicity. The 12-amino acid linear Peptide 31 (YHWYGYTPERVI), an EGFR-binding sequence, has demonstrated strong in vitro selectivity toward EGFR-overexpressing TNBC cells with minimal effects on nonmalignant epithelial tissue, making it a compelling candidate for PDC development. Notably, conjugation of Peptide 31 to doxorubicin (Dox) retains its tumor selectivity while maintaining cytotoxic potency comparable to free Dox. Hence, we synthesized the cytotoxic intermediate MCC–Doxorubicin (MCC–Dox) via a Michael addition of doxorubicin to a maleimide-functionalized linker in anhydrous DMF, yielding 1.787 μmol (1.45 mg) of product for subsequent conjugation with the later-synthesized peptide using solid-phase peptide synthesis (SPPS). The compound was purified by reverse-phase high-performance liquid chromatography (RP-HPLC) and confirmed by MALDI-TOF mass spectrometry, which detected a molecular weight of 786 g/mol ($[M+Na^+]$), consistent with the expected structure. This synthesis establishes a robust chemical foundation for site-specific conjugation and represents a critical step toward the development of a modular, tumor-targeted platform for EGFR-positive TNBC, with future research aimed at evaluating its biodistribution in mice.

Business**12. The Impact of AI on Innovation****Presenter(s):** Alexandra Vo**Advisor(s):** Dr. Bruce Dehning

Research Question: This is an exploratory study on how AI use impacts innovation, as measured by patent applications. Methodology: Researchers, including Cockburn et al. (2018), highlight AI's role as a "method of invention" that enhances R&D efficiency. In this study, we measure the number of patent applications in 6 countries with varied levels of AI use before and after ChatGPT 3.5 was released. Each country's innovation change can be measured as the change in the number of patent applications. Then, we test if the change in the number of patent applications after ChatGPT 3.5 is correlated with AI use in each country. Results: AI use is not correlated with innovation as measured by the change in patent applications. This is likely due to the lag between AI implementation and patent applications due to the long-term nature of research and development. References: Cockburn, I., Henderson, R., & Stern, S. (2018). The impact of artificial intelligence on innovation. National Bureau of Economic Research Working Paper No. 24449. Toner-Rodgers, A. (2024). Artificial Intelligence, Scientific Discovery, and Product Innovation. MIT

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Chemistry

13. Adsorptive and Desorptive Behavior of Metal Cations on Iron Oxyhydroxide Nanoparticles Under Varying Salinity Conditions

Presenter(s): Cristina Inboden, Miguel Olivas

Advisor(s): Dr. Christopher Kim

Metal contaminants in aquatic systems can be effectively sequestered from the dissolved phase through adsorption to mineral particle surfaces such as those of iron oxyhydroxides. However, the variable salinity of natural waters can complicate the adsorption, desorption, and retention of metal ions to such sorbents. This study aims to characterize the adsorptive and desorptive properties of zinc and copper metals in multiple saline conditions at concentrations ranging from those in freshwater to saltwater systems. This allows for the identification of which metal demonstrates greater retention or higher adsorption efficiency and which salt most effectively facilitates the binding of metals to iron oxyhydroxides.

FeOOH (goethite) nanoparticles were synthesized through an established flash microwave method, washed in 1000 MWCO dialysis tubing against DI water for 5 days, then stored in suspension at 4°C at their as-synthesized pH between 4.5 and 5.0. The nanoparticle suspensions were then exposed to 0.5 mM Cu (II) or Zn (II) with the pH adjusted upwards to 6.5 and 7.5, respectively, to induce metal cation adsorption to the nanoparticles. After a 24-hour adsorption period, the sorbed nanoparticle suspensions were exposed separately to sulfate, chloride, sulfate + chloride, or artificial sea water (ASW) at concentrations representing the range from freshwater to seawater. After 18 hours, the suspension pH was reduced to 5.0 to induce metal cation desorption from the nanoparticles. The suspensions were then centrifuged, filtered through a 0.45 µm filter, and acidified to a pH less than 2 before the supernatants were analyzed using Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES). The percentage of metals absorbed and retained in the separate environments were calculated from the ICP-OES data. The results suggest that the salt conditions examined enhance the adsorption and retention of both metals in the following order: sulfate < chloride < sulfate + chloride < ASW, and that Zn (II) exhibits higher retention than Cu (II) in all environments.

14. Effects of Freezing and Organic Matter on Iron Oxyhydroxide Nanoparticle Aggregation

Presenter(s): Janelle Jacques

Advisor(s): Dr. Christopher Kim

Metal contaminants are a significant concern in a wide range of aquatic systems, which leaves a probable concern for human and environmental health. One way of reducing potential exposure to metals in aquatic systems is by adsorption of dissolved metal ions to a solid phase, like iron hydroxides which are found in abundance in natural systems. After iron hydroxides form in natural waters, they often rapidly aggregate because of changing physical conditions, which will affect their effective sorption capacity. In the current study, we have explored the effects of freezing iron hydroxide suspensions and the presence of dissolved organic matter on iron oxyhydroxide nanoparticle aggregation.

FeOOH (goethite) nanoparticles were synthesized through a flash microwave method, washed in 1000 MWCO dialysis tubing against DI water for 5 days, then stored in suspension at 4°C at their as-synthesized pH between 4.5 and 5.0. After synthesis, aliquots of the nanoparticle suspension were frozen for varying lengths of time from 0 to 65 minutes in a -70°C freezer, after which the remaining liquid was recovered and weighed to calculate the percentage of frozen suspension. This will simulate the freezing over of lakes and natural waters, which will show us how our iron oxyhydroxide nanoparticles behave in those environments. Separately, aliquots of the nanoparticle suspension were exposed to fulvic acid in concentrations ranging from 0-150 mg/L for a period of 5 days. This also shows the behavior of iron hydroxide nanoparticles under dissolved organic matter concentrations representative of the natural environment. All nanoparticle aggregates were then analyzed to determine their average size and size distribution using a SEM Micromeritics PSA and a Mobius Dynamic Light Scattering (DLS) instrument. From the data collected from these two systems, the results demonstrate an increase in aggregate size with progressive freezing and organic matter. Furthermore, aggregates show progressively lower levels of Cu(II) and Zn(II) adsorption and retention than non-aggregated nanoparticles.

15. Assessing Arsenic Bioaccessibility and Spatial Distribution in Mine Wastes: An Integrated Microscopic and Macroscopic Approach

Presenter(s): Lea-Sophie Vetter

Advisor(s): Dr. Christopher Kim

Arsenic (As) is a toxic trace metalloid that harms both humans and the environment due to its carcinogenic nature. Anthropogenic activities, especially mining, mobilize arsenic as fine-grained mine wastes. Prolonged exposure to low-level arsenic occurs in communities near abandoned mine sites, primarily through inhalation or ingestion. Therefore, understanding arsenic bioaccessibility is critical for long-term risk assessment and remediation efforts. Bioaccessibility is influenced by multiple variables, such as speciation and physical weathering, and some that remain under-studied, including spatial distribution. This project seeks to assess the effectiveness of arsenic spatial distribution as an indicator of changes in bioaccessibility over time, with the overall objective of identifying a more efficient method for prioritizing mine sites for remediation

efforts. The methods include multiple approaches, with the collected data used in a comparative analysis. Simulated gastric fluid extractions of ground and unground samples are performed to simulate the pathway of ingestion and analyzed using ICP-OES to determine the percent arsenic bioaccessibility. SEM-EDS analysis on prepared thin sections of the sample provides data for visualization, morphology, texture, and elemental characterization. Additionally, micro-XRF maps and data are utilized in a quantitative analysis to determine spatial distribution. Various comparative analyses are conducted on the datasets collected, such as comparing the spatial distribution of samples with bioaccessibility data to identify correlations. By identifying such correlations, the value of using spatial distribution as a predictor of arsenic bioaccessibility is assessed. These findings have the potential to streamline the process of assessing long-term risks of arsenic exposure from abandoned mine sites. The project proposes a novel approach for prioritizing mine sites for remediation based on spatial distribution data and bioaccessibility correlations.

16. The Desorption Extent and Rate Between Cu(II) Ions and Iron Oxyhydroxide Nanoparticles is Inversely Proportional to Exposure Time.

Presenter(s): Miguel Olivas

Advisor(s): Dr. Christopher Kim

The contamination of aquatic systems with heavy metals poses a substantial risk to both humans and the environment's health. Heavy metals come from the earth's crust, and are released through activities including metal mining, fossil fuel combustion, and metal processing. Trace metals such as lead (Pb), copper (Cu), and zinc (Zn) in aquatic systems can lead to significant health issues. However, dissolved metal ions can be removed from the solution through adsorption to mineral phases, including iron oxyhydroxides. However, the long-term sequestration and kinetics of metal removal and remobilization are not well characterized.

Iron oxyhydroxides can form in the environment as nanosized particles with a high surface area-to-volume ratio and unique physical and chemical properties that render them effective sorbents to metal ions. Studying metal-nanoparticle interactions in controlled settings will provide insight into how toxic metals behave in the water and how nanotechnology can be used to clean up contaminated water. This research aims to use iron oxyhydroxides to investigate metal ions' adsorption and desorption processes on iron oxyhydroxides during different exposure time intervals. Copper metal ions were introduced into aqueous suspensions of synthetic iron oxyhydroxide nanoparticles, and their dissolved concentrations were measured over time using ion-selective electrodes (ISE) to assess the adsorption and desorption rate as a function of exposure time. After completing the phases, the data between the metals will be analyzed to assess retention by the iron oxyhydroxides. Preliminary data have shown a trend where the longer the heavy metals associated with the iron oxyhydroxide nanoparticles, the more the metals are retained and the slower the measured metal desorption rate. This has implications for long-term metal sequestration and reduced potential toxicity of metals sorbed to solid mineral phases in the environment.

17. Bimetallic Core-Shell Nanoparticles as Promising Photocatalysts

Presenter(s): D'Angelo Alvarez, Stephanie Hoang

Advisor(s): Dr. Jerry LaRue

Nanoparticle structures have emerged as a cornerstone of modern nanoscience and technology, as nanoparticles possess tunable properties that make them highly adaptable for specific needs in the chemistry industry. With their unique ability to undergo finely tuned surface chemistry, nanoparticles can serve as effective photocatalysts. This process, known as photochemistry, gives a new edge, especially in addressing pollution issues in industry. Modern methods for producing fuel are often energy-intensive and use a lot of resources, including water and carbon dioxide (CO₂), which ultimately result in toxic CO emissions. These conventional methods not only deplete valuable materials but also negatively impact the environment and show low efficiency in terms of energy usage. By analyzing nanoparticle structures of elements such as Gold and Titanium Nitride (TiN) it allows for a more green and cost effective way of producing fuel instead of using classic methods. Photocatalysts used in production provide an opportunity of renewable energy use in which light is exclusively their activator thus consuming less available energy. The process provides non harmful products, with the processes undergoing CO oxidation and CO₂ hydrogenation to output water, methane and CO₂ being much less harmful than the counterpart CO. This project focuses on evaluating viable elements with dependable nanoparticle structures, particularly using bimetallic core-shell nanoparticles with Titanium Nitride as the core. Ruthenium, rhodium, and nickel have been used as shell metals. These core-shell structures enhance the catalytic behavior of the plasmonic cores, offering significant advantages due to their specialized properties. The nanoparticles are synthesized and purified through centrifugation, followed by in-depth analysis using Scanning Electron Microscopy, Energy-Dispersive X-ray Spectroscopy, Transmission Electron Microscopy, and Ultraviolet Absorption Spectroscopy. The anticipated data strongly suggest that photocatalysts offer a promising and efficient alternative to current practices.

18. Hot Electron Chemistry on Bimetallic Titanium Nitride Core-shell Nanoparticles

Presenter(s): Stephanie Hoang, D'Angelo Alvarez

Advisor(s): Dr. Jerry LaRue

The increase in CO₂ pollution has become a prevalent global climate issue. CO₂ pollution can be mitigated by converting CO₂ into CH₃OH (methanol) or other hydrocarbons to create renewable fuel through a hydrogenation reaction using catalysts. Photocatalysts are a class of catalysis that changes reaction rates when excited and can be used to assist in creating green fuels. Our plasmonic photocatalysts are bimetallic transition metal core-shell nanoparticles composed of a plasmonic core and a chemically active transition metal shell. The core metal displays a phenomenon called localized surface plasmon resonance that generates excited or "hot" electrons when absorbing light. The addition of a transition metal shell enhances the plasmonic core, and the resulting core-shell nanoparticles exhibit unique optical and catalytic properties that contribute to their photocatalytic abilities to efficiently generate hot electrons for use in

excited state chemistry. This project focuses on titanium nitride (TiN) as the core metal used to synthesize bimetallic core-shell nanoparticles. As of now, ruthenium (Ru), rhodium (Rh), and nickel (Ni) have been used as the shell metal. The TiN/Ru and TiN/Rh nanoparticles (NPs) are synthesized using reflux reactions, washed using a centrifuge, and characterized using Scanning Electron Microscopy (SEM), Energy-Dispersive X-ray Spectroscopy (EDX), Transmission Electron Microscope (TEM), and Ultraviolet Absorption Spectroscopy (UV-Vis). Characterization of the synthesized bimetallic core-shell nanoparticles depicted favorable size, shape, and elemental distribution for photocatalysis. The photocatalytic efficiency of the bimetallic core-shell nanoparticles were assessed through the hydrogenation of CO₂ using a photoreactor chamber equipped with mass spectrometry and Raman spectroscopy. Using bimetallic core-shell nanoparticles, we aim to understand their photocatalytic properties and use these promising catalysts to assist in creating renewable fuel in order to reduce CO₂ pollution.

19. Study of Methanol Decomposition on a Platinum Surface

Presenter(s): Mia Lee

Advisor(s): Dr. Jerry LaRue

Exploring surface methanol has been an important subject of study as it is a key intermediate in methanol decomposition catalytic reactions. Therefore, studying methanol decomposition is important for reactions used in hydrogen purification, catalytic reactions that help with a methanol-based alternative fuel source, and help reduce industrial energy consumption and waste. So, we want to understand methanol on a molecular level better in order to understand reaction rate and selectivity. As well as understand bond interactions on a molecular level and further improve methanol decomposition catalytic reactions. Our research experiment studies methanol decomposition on a Platinum-type surface, specifically Pt (111), due to its ability to allow methanol decomposition intermediates, such as methoxy, to exist in a well-studied, controllable condition on a flat surface that is easy to bond to. This experiment builds off the existing research, further exploring methanol's behavior and learning how and why the carbon-oxygen bonds break on terrace sites on Pt (111) instead of step sites as expected of methanol decomposition. This data was gathered in a collaborative effort between the LaRue Cat Lab and Stockholm Lab Data. The experiment utilizes and analyzes the data gathered from Temperature-Programmed Desorption (TPD) Spectroscopy and Sum Frequency Generation (SFG) Spectroscopy techniques to observe methanol decomposition. All of these spectroscopy techniques were done under Ultra High Vacuum (UHV) conditions; the sample was cleaned for TPD analysis using Argon Ion sputtering at 1.0×10^{-5} Torr, and Oxygen was cleaned at 2.0×10^{-7} Torr to ensure a rough and oxygen-free surface. The Stockholm Lab collected the SFG data. Through our experimentation, we aim to bring more to the current knowledge on the energetics of adsorbed methanol and methoxy and enhance our understanding of methanol decomposition to improve our understanding of methanol decomposition catalysts.

20. Computational Insights into Fluorinated Morphine Derivatives for Improved Pain Management

Presenter(s): Mirabella Romano, Allison Vu, Emily Chen

Advisor(s): Dr. Matthew Gartner, Nayiri Alexander, Makena Augenstein

The opioid epidemic impacts 60 million people worldwide every year. Morphine, a commonly prescribed opioid, binds to the mu-opioid receptor (MOR) in the body via protonation of the tertiary amino group of morphine and the MOR. An unfortunate side effect of this binding process is its non-selectivity in both peripheral and central tissues. While activation within inflamed peripheral tissues results in pain relief, activation within central tissues results in the unwanted and addictive side effects of opioids. Because there is a discrepancy in pH between healthy (central) and inflamed (peripheral) tissue, selective binding within the inflamed tissues results in pain relief without addictive properties. Fluorination of the morphine molecule results in a reduction of pKa that induces selective protonation (binding) within the lower pH environments of inflamed tissues while avoiding activation within the CNS. Additionally, the removal of the C and D rings of morphine alters its steric properties, potentially improving receptor fit and binding efficiency by increasing the flexibility of the molecule. These structural modifications also influence lipophilicity, measured by the partition coefficient (logP), which impacts the drug's ability to cross lipid membranes. Computational logP calculations using XLOGP3 found that morphine has a logP of 0.88, whereas fluorinated derivatives exhibit increased lipophilicity: fluoromorphine Beta-C1 (1.91), fluoromorphine Beta-C2 (0.85), and fluoromorphine Beta-C3 (2.05). The significantly higher logP values of Beta-C1 and Beta-C3 suggest enhanced partitioning into lipid-rich inflamed tissues, improving selectivity while minimizing CNS interactions. The aim of this study involves further assessment of these derivatives using molecular docking simulations that will be conducted in Schrodinger software to predict ligand-receptor interactions with MOR. Gathering Gibbs free energy (ΔG) and logP data will determine which derivative(s) should be synthesized and studied further.

Communication Sciences and Disorders

21. Object Recognition in Hearing Infants and Infants with Cochlear Implants

Presenter(s): Sarrah Wilkes

Advisor(s): Dr. Mary Fagan

As infants better understand their sense of self and the environment around them, they begin to incorporate their prior experiences into the environment. With this comes the ability for infants to demonstrate object use or function in their lives. As discussed by Xu (2002), the question of how language plays a role in conceptual development is vital to our understanding of development as a whole. However, little research has been done on the comparison of object use in hearing infants and infants with cochlear implants. The purpose of the current observational study is to compare object recognition in hearing infants and infants with cochlear implants,

ranging from eight to twenty months old, and to investigate whether age plays a role. A total of seventeen infants, either hearing or with cochlear implants were included in this study. All infants were presented with the same four objects (i.e., a cup, car, comb, and phone) to determine whether they could demonstrate the proper function of the object (i.e., sip from a cup, comb their hair, etc.) without the help of a caregiver. This study will enhance our knowledge of the influence of cochlear implants on the development of object use in infants with hearing loss.

22. The Influence of Cochlear Implants on Infant Responses to Maternal Bidding Behaviors

Presenter(s): Taylor Low, Jesille Terry

Advisor(s): Dr. Mary Fagan

Cochlear implants (CIs) are assistive electronic devices that provide auditory input to those with severe to profound hearing loss. However, research has shown that infants with CIs tend to show differences in early language development in comparison to hearing infants without cochlear implants. Early language development plays an important role in a child's literacy skills, communicating abilities, and overall cognitive and social development. A critical factor in this development throughout early childhood is how infants respond to verbal input from their caregivers. The purpose of this study was to investigate the impact of access to cochlear implants on the nature and frequency of infant's responses to maternal verbal behaviors. Infant responses were categorized into verbal and nonverbal types. Verbal responses included non-word utterances (e.g., babbling, jargon, coos, cries) and words, while non-verbal responses encompassed eye contact, or physical interactions with the mother. Physical interactions refer to the direct, tactile exchanges between a mother and their infant including hugging, touching, or being held. Data from this study were collected from pre-recorded videos of mother-infant interactions involving 10 infants, including 5 with cochlear implants and 5 without. This study aims to analyze how hearing loss influences the frequency and types of infant response elicited in response to maternal verbal behaviors.

Communication Studies

23. Sleep On It

Presenter(s): Kerry Graydon, Rylee Knapp, Abigail Cohen, Brianna Jones, Ryan Jacobson

Advisor(s): Dr. Rebecca Forster

This study investigates how message framing influences attitudes and behaviors toward sleep health. Past research has only looked at either gain or loss messages, but as a group we want to see the combination of the two. Conducted at Chapman University, the research involved CU student participants completing baseline sleep habit surveys, followed by exposure to one of four message conditions: (1) gain-framed message (emphasizing benefits of healthy sleep), (2) loss-framed message (highlighting risks of poor sleep), (3) combined gain-loss, and (4) combined loss-gain messages. Participants then answered questions evaluating their likelihood of adopting

healthier sleep behaviors, seeking additional resources, or discussing sleep improvement with others. The study aims to determine which framing method is most effective in motivating positive behavioral change. Findings will contribute to improving public health messaging strategies regarding sleep health.

24. Exploring the Interplay of Social Pressure, Celebrity Bashing, Cancel Culture, and Social Media Dynamics

Presenter(s): Ryan Cassell, Brianna Edwards, Cayman Rai, John Shelton, Shira Tamler

Advisor(s): Dr. Rebecca Forster

This study examines the psychosocial mechanisms underlying participation in online cancel culture, specifically investigating how media exposure to celebrity bashing influences individuals' willingness to engage in such behavior. As online spaces increasingly shape public discourse, understanding the role of social pressure in amplifying cancel culture is crucial. The participation in celebrity bashing, directly criticising a famous or notable person's actions, through these online spaces is a form of cancel culture. This research explores how exposure to celebrity bashing contributes to social conformity and perceived pressure to participate in said bashing.

Our study hypothesizes that (H1) exposure to celebrity bashing increases the likelihood of bashing intentions, (H2) exposure to celebrity bashing heightens perceived social pressure to engage in celebrity bashing, and (H3) perceived social pressure positively correlates with bashing intentions. To test these hypotheses, we will conduct an online experiment in which participants are exposed to varying levels of negative commentary on social media about a celebrity. Participants then report their likelihood of engaging in bashing behaviors, as well as their perceived social pressure and fear of rejection if they choose not to participate.

25. Modernizing Media Multiplexity Theory: Online and Offline Communication Amalgamation

Presenter(s): Zachary Collins, Amia Polyanna Ignacio, Oliver Kazandjieff

Advisor(s): Dr. Wenshan Jia

The Media Multiplexity Theory (MMT) by Caroline Haythornthwaite is a fundamental communication theory that centers on mediated online communication and tie strength (closeness). Previous research failed to acknowledge a significant gap that left current quantitative data generalizable. This research focuses on bridging the gap between online and offline communication channels that the MMT fails to account for. The researchers conducted three autoethnographies each focused on three distinct areas of interpersonal communication in offline and online contexts: personal, peer, and work experiences to draw varying themes. The researchers accounted for nine reflections that touched upon different cultural backgrounds to allow for more nuanced data. Upon examination of the themes drawn from the data, it is clear that offline communication is just as crucial as a determining factor of tie strength as online communication. Additionally, findings demonstrated a connection between offline and online communication in the ever-changing mediated communication landscape.

Computational Science

26. AutoVert: Semi-Automatic Segmentation of Repeated Structures in 3D Slicer

Presenter(s): Anna Harner

Advisor(s): Dr. Cassandra Donatelli

The digital segmentation of anatomical structures is a fundamental aspect of many medical and biological studies. Segmentation involves digitally labeling a piece of morphology represented by an image stack typically generated from a CT or MRI scan. However, this process can be time consuming and a limiting factor in large comparative studies. Semi-automatic and fully-automatic segmentation methods have been developed to address this problem. However most tools are specialized for one task (e.g. locating tumors), cannot handle diverse morphologies, or require large training datasets. Here, we present AutoVert, a tool implemented to work with 3D Slicer to semi-automatically segment repeating structures such as vertebrae, ribs, or armor plates. We modified Meta's 2D "Segment Anything" model to segment 3D data by iteratively segmenting out the structure in a series of images. Because "Segment Anything" has already been trained on 1.1 million images and 1.1 billion masks, AutoVert does not require additional training data to generate high quality segments. With the AutoVert user interface, users will be able to select and segment desired structures with a few clicks or by defining a bounding box. We found that our module can create a segmentation 6x faster than existing 3D Slicer methods. Though AutoVert was initially designed to segment repeating structures, the module also works for individual structures (i.e. skull, femur, etc.).

Computer Science

27. HarmonicThreads – An Interface That Supports Accessibility in Musical Interaction

Presenter(s): Ellie Nguyen

Advisor(s): Dr. Franceli Cibrian

Our research centers on the development of HarmonicThreads, a fabric-based computer interface that facilitates musical interaction. This work aims to provide an inclusive and enriching music production experience for users regardless of physical abilities and musical backgrounds. To make the system intuitive and natural to use, we develop an interface where users can create and control sounds easily by touching a responsive fabric surface. We implement this by combining an elastic fabric display with sensor-driven inputs and Pure Data, a visual programming language we use to synthesize sounds and create visual feedback. As we test ways to influence sounds with sensor data, we find many possible approaches to respond to the user's gestures. Since this project serves as a proof of concept, we conduct user studies to evaluate the usability and satisfaction of the current setup in a real scenario. Two conditions are examined in the study. In the first condition, participants are asked to interact with the system without automated notes.

In the second condition, automated notes will play alongside the user to accompany them. We find that the first condition is preferred by users who wish to have more control, and the second condition is preferred by users who enjoy a more collaborative and supportive musical experience. We collect feedback from these studies to improve the design's accessibility and creativity. This advancement can inspire further developments in both the arts and technology. We base this abstract on a paper titled "HarmonicThreads – An Interface That Supports Accessibility in Musical Interaction", which has been accepted for publication in the Demo Track at the IEEE PerCom 2025 Conference.

28. Current Security and Privacy Challenges in Cloud Computing: A Review

Presenter(s): Chris Joo, Gabriel Giancarlo, Julian Carbajal, Kevin Oropeza

Advisor(s): Dr. LouAnne Boyd

The migration to cloud computing environments introduces significant cybersecurity and privacy concerns across various domains. This abstract examines three recent academic papers that analyze these challenges in different cloud contexts. Abdulsalam and Hedabou (2021) investigate how outsourcing information to cloud providers introduces critical security vulnerabilities, particularly emphasizing the need for adaptive security approaches that can respond to evolving threats. Their work notably employs the STRIDE approach to classify security threats from the user perspective, providing a comprehensive analysis of multiple vulnerabilities affecting different components of cloud infrastructure. Raja and Chopra (2024) offer a more recent perspective, conducting a systematic exploration of cloud security challenges with particular attention to data breaches and unauthorized access. Their research contributes valuable insights for practitioners navigating the increasingly complex landscape of cloud-based services. Ahmad et al. (2021) expand the scope to IoT-based cloud computing, where they categorize security issues into four domains: data security, network and services security, applications security, and people-related security issues. This classification proves particularly valuable as traditional security solutions often prove inadequate in these integrated environments. Collectively, these papers highlight a critical finding: conventional security mechanisms designed for traditional computing environments are frequently ineffective when applied to cloud architectures. The research emphasizes the importance of developing cloud-specific security frameworks that can address challenges unique to distributed, multi-tenant environments where data storage, processing, and management transcend traditional boundaries. As organizations continue transitioning to cloud platforms, these insights provide essential guidance for implementing appropriate security measures.

29. Exploring Human-Centered Principles to Improve Lecture Slides

Presenter(s): Joshua Harlev

Advisor(s): Dr. LouAnne Boyd

As a university emphasizing student participation and attention, lectures are central to the educational experience at Chapman. However, slide-based lectures can widely vary in quality and

approach. Considering various debunks of learning styles over the years, it seems more difficult than ever to understand how to most effectively teach students. Effective use of computerized tools has thus become increasingly important as the pace of change continues to increase. Yet, research is available on the effectiveness of teaching methods that can provide guidelines for instructors. With increasingly connected and capable devices at our fingertips, it is imperative to both use the technology to our advantage and cut through distractions by creating engaging material. Using a human, research-based approach, this work aims to optimize the time and attention of students and instructors, precious resources that demand careful consideration. Employing research focused on human factors such as habituation, accessibility, and cognitive load theory, current faculty slides were analyzed. Quantitative and qualitative approaches were taken to discover trends in slide design and to identify areas of improvement. For instance, when surveyed, a majority of faculty respondents indicated a desire to create more engaging slides in less time. Additionally, slides were analyzed for readability, visual layout, and accessibility. Strategies to make the development of slides more effective and efficient are proposed, along with directions for future research and development.

30. Development of Interactive Games on an Affordable Braille Display

Presenter(s): Daniel Tsivkovski, Dylan Ravel

Advisor(s): Dr. Maryam Etezad

Developing an affordable and STEM learning-focused Braille display addresses a significant disparity in the market for Braille displays, where most fail to provide a cost-effective, accessible, and education-oriented solution. This research aims to bridge this gap through innovative hardware and software development, offering a comprehensive learning experience to elementary school children (K-6) who are blind/visually impaired. The hardware features a piezo-electric tactile display that displays up to six Braille characters at once or a shape in an 8x8 pin array configuration. The educational software includes a user-friendly website packed with engaging STEM activities specifically designed for blind/visually impaired children. The overall system is designed to be plug-and-play, minimizing technical setup and user errors so that students can focus on exploration and discovery through STEM.

31. EcoDrone: Autonomous Environmental Monitoring

Presenter(s): Brandon Lee

Advisor(s): Dr. Tom Springer

This project presents EcoDrone, an autonomous aerial drone designed for continuous and automated environmental monitoring. Current environmental monitoring methods rely on stationary sensors or manual data collection, limiting real-time response capabilities. This reliance leads to delayed, incomplete, and spatially limited data and restricts the ability to capture real-time changes. Another challenge includes the difficulty of environmental monitoring in challenging terrain, whether it be wildfire areas, dense forestry, or mountainous terrain. EcoDrone overcomes these challenges by autonomously navigating difficult terrain to collect real-

time data, offering more flexible and timely monitoring than stationary or manual methods. The central research question investigates integrating standard consumer components and open-source software to create a drone system to improve real-time data collection. EcoDrone integrates a suite of onboard sensors to measure temperature, humidity, pressure, and CO2 concentration, transmitting real-time data to a ground station for analysis. The research methodology includes hardware and software systems integration and preliminary flight testing. System integration includes implementing the base DJI Tello drone's flight control and status logging onto a separate onboard ESP32 microcontroller. The controller, living on top of the drone, sends pre-programmed flight path commands to the drone and records the drone's status (i.e. battery, height, velocity, acceleration). Simultaneously, the external sensors take measurements and are logged locally on the microcontroller's built-in storage and transmitted in real time. Expected results include successful flight control and environmental sensing integration, reliable real-time data transmission, and improved spatial coverage in difficult terrain. EcoDrone is expected to demonstrate the feasibility of low-cost, autonomous monitoring solutions for capturing dynamic ecological data with greater efficiency and adaptability than conventional methods.

32. Toward Personalized Virtual Reality Gait Training System for Full-Body Obstacle Avoidance Using Real-Time Motion Analysis

Presenter(s): Alexandra Fomina, Quillan Gee, Laurel Latt

Advisor(s): Dr. Trudi Qi

This research presents a personalized virtual reality (VR) gait training system that combines advanced motion tracking, real-time analysis, and adaptive obstacle scenarios to support rehabilitation, enhance immersion, and improve safety in VR environments. Developed in Unreal Engine 5, the system uses Sony Mocopi wearable sensors and the Meta Oculus Quest 2 headset to simulate realistic full-body obstacles—such as tree branches, rocks, and logs—that mirror real-world challenges in a safe, controlled setting. Full-body motion is captured at multiple key points, and user movements are classified in real time using a decision tree algorithm trained on data from multiple users. The algorithm uses validated motion thresholds to detect ducking (at least 12 cm head dip), stepping over (minimum 11.5 cm foot lift), and side-stepping (based on lateral hip displacement), and can also identify combinations of these actions. Movements are analyzed hierarchically: ducking is assessed first, followed by stepping over (distinguishing left vs. right foot), then side-stepping. To address sensor drift and synchronization issues, a real-time bidirectional calibration mechanism integrates positional and rotational data, allowing the virtual avatar to closely mirror the user's physical movements. A single-click calibration interface enhances usability and accommodates users of varying heights. Additionally, adaptive motion algorithms improve avatar fluidity and reduce motion sickness during self-paced treadmill walking by smoothing transitions in foot movement data. Initial testing confirms the system's ability to detect obstacle-avoidance strategies with high accuracy in real time. Future work

includes conducting user studies and developing machine learning models to predict optimal movement strategies for personalized gait rehabilitation.

33. Real Steps, Virtual Worlds: Enhancing VR Walking with Adaptive Motion Algorithms

Presenter(s): Laurel Latt, Alexandra Fomina, Quillan Gee

Advisor(s): Dr. Trudi Qi

The integration of virtual reality (VR) systems and motion tracking is the next step in creating immersive simulations, however, a disconnect remains between real-life movement and VR experiences due to the difficulty of simulating human motion. Without speed data from a treadmill, avatar movement becomes jerky and induces motion sickness. This work focuses on improving the user experience by reducing motion sickness and enhancing immersive walking in VR on a self-paced treadmill. To achieve this goal, we developed a detailed understanding of how our program collects data from VR and wearable motion sensors, ensuring smooth transitions between real-life walking and treadmill use. We designed an algorithm that collects real-time tracking data from users and detects which foot is moving, based on the difference in location between frames and foot height. These measurements are checked against tested thresholds to reduce inconsistencies in motion sensor data collection. The metrics are then used to control avatar and camera movement, accounting for built-in VR headset and motion tracking mechanics. Preliminary tests, conducted using Mocopi motion tracking systems with Unreal Engine (UE) VR, indicate improved avatar movement accuracy compared to default systems. Additionally, our algorithm has successfully reduced motion sickness, as verified through tests comparing our program to basic VR simulations in UE. Our methods provide a smoother, more immersive walking experience in VR environments, improving both user-avatar synchronization and overall user experience. The next steps are to complete algorithm development, integrate obstacle avoidance, and conduct a user study to evaluate its effectiveness.

34. Multi-Modal Tensor Fusion for Alzheimer’s Disease Recognition

Presenter(s): Mason Li, Tiffany Le

Advisor(s): Dr.Yuxin Wen

Accurate and early diagnosis of Alzheimer’s disease (AD) is vital for effective intervention and patient care. Traditional diagnostic approaches rely on single modalities such as clinical assessments, neuroimaging, or genetic markers, which may fail to capture the complex, multifaceted nature of AD. Furthermore, existing modality fusion techniques, such as concatenation, fail to capture the joint relationships present between different modalities. To address this challenge, we propose a multimodal tensor fusion network (MTFN) that integrates heterogeneous data sources, including visual imagery, demographics, and time-series data, to enhance AD recognition. Our approach leverages tensor representations constructed using an outer product to model intricate cross-modal interactions while preserving structural dependencies within each modality. MTFN utilizes modality-specific embedding subnetworks to obtain embedding representations of the data, which are fused through an outer product to form

a third-order tensor—allowing the model to capture interactions between modalities. Experimental results on publicly available AD datasets demonstrate that the proposed method outperforms the accuracy of the state-of-the-art deep learning classification methods, especially when training data is limited. On a restrictive AD dataset, MTFN outperformed unimodal models by 60% and strongly resisted overfitting compared to existing models. This suggests that the interactions captured by tensor fusion strongly support MTFN’s ability to learn meaningful data. This work highlights the potential of tensor-based multimodal learning to advance precision medicine for neurodegenerative diseases. Tensor fusion also promises to improve other branches of precision medicine—such as survival analysis—by effectively modeling the complex, non-linear interactions in data using the outer product.

Dance

35. Choreography and Film: A Reflection on Artistic Growth

Presenter(s): Bella Murrieta

Advisor(s): Stephanie Liapis

My dance film, “again&again,” which I directed and choreographed last fall semester, demonstrates everything I have learned over the past 3 years, presenting creative and thought-provoking visuals that explore my passion for dance and film. I collaborated with film students to establish the cinematography, location scouting, set safety, and post-production elements. I cast and workshopped with dance majors at Sandi Simon to explore original formations and movement patterns that fit the song’s aesthetic and overall film. Because Chapman does not currently offer a Dance Film class, planning, coordinating, and executing dance films outside of the current curriculum of my majors shows my dedication to personal research and interest in becoming a professional working in the entertainment industry with multiple skill sets. Every year, my craft as a choreographer/director grows as I seek out new opportunities to present my work and watch other creatives pursue the niche field and crossover of dance and film. Attending the CineVox Dance Film Festival in Portland, Oregon, was a beneficial opportunity for me to present my creative research through my dance film “again&again” and represent both of Chapman University’s exceptional film and performing arts programs while continuing my research by attending screenings of dance films from across the world. This opportunity contributed to my academic career by expanding my perspective for my final semester as I create my final dance film as a student. I gathered inspiration from dance filmmakers and asked them questions about their challenges when balancing originality and creativity with logistical elements to produce a dance film that represents their growth as an artist. I am honored my dance film was selected for this year’s CineVox Dance Film Festival, especially as someone who discovered their love and passion for dance and film through Chapman University.

Data Analytics

36. APIs Impact and Its Financial Benefits for Startups and Companies Achieving IPO

Presenter(s): Sean Wu, Ethan Esparza

Advisor(s): Dr. Jonathan Hersh

This research explores the impact of Application Programming Interfaces (APIs) on startup success, with a particular focus on their influence in acquisition rates. This research investigates the impact of Application Programming Interfaces (APIs) on startup success, particularly focusing on their influence in acquisition outcomes, IPO performance, and the broader dynamics of value creation versus value capture. Grounded in digital platform theory and informed by key scholarship such as *The Digital Platform: A Research Agenda*, our study examines how APIs enable startups to integrate into platform ecosystems, thereby expanding access to resources, increasing visibility, and enhancing scalability. We combine scholarly literature with industry reports to contextualize the strategic value of APIs in a rapidly evolving digital economy. Utilizing the Crunchbase dataset and performing data analysis in RStudio, we employ scatter plots, box-and-whisker plots, violin density plots, and other visualizations to examine relationships between API usage and startup performance metrics. Our analysis reveals that companies with APIs tend to raise significantly more capital at IPO, with median funding levels notably higher than those without APIs. Violin plots show a visibly wider distribution and higher median for API-enabled firms in both money raised and number of full-time employees at IPO, indicating stronger investor confidence and organizational scale. Sector-specific scatter plots further demonstrate that the relationship between API adoption and funding varies by industry, with positive correlations in Financial and Communication Services, and weaker or negative correlations in Consumer Cyclical and Technology sectors. These findings suggest that APIs contribute not only to technical functionality but also to strategic positioning in the market, allowing startups to better capture value through ecosystem participation. Ultimately, our research contributes to an evolving discussion on digital infrastructure's role in entrepreneurial success, underscoring APIs as bo

37. Tracking Daily Habits for Personal Development: Analyzing Trends and Improving Well-being During the Spring 2025 Semester

Presenter(s): Lauren Cardenas

Advisor(s): Dr. Oliver Lopez

Although our lives get busy, keeping track of our daily activities and habits can provide insight on our personal habits and behaviors which can force us to take self-improvement seriously. In this study, I have been collecting data on ten daily variables throughout the Spring 2025 semester: minutes spent studying for accounting, number of steps, hours of sleep, reading habits, time spent listening to music, phone usage (calls, pickups, notifications), daily mood ratings, and time spent on social media. The goal of collecting ten variables worth of data is to track and analyze certain trends in my daily life and to make positive shifts to enhance my overall well-being and

productivity. I will be collecting data to identify patterns, such as potential fluctuations in these behaviors during the weekends and midterm/final seasons. The expected conclusion from the data highlights the importance of self-tracking daily habits and behaviors for personal development and improvements in one's lifestyle.

38. Bridging the Gap: Comparing Motor Task Performance in Lab and Home Environments for Stroke Rehabilitation

Presenter(s): Priya Gadhe

Advisor(s): Dr. Rahul Soangra, Michael Shiraishi

Recovering motor function after a stroke is a journey that extends beyond the clinic, where the familiar walls of a lab can't fully mimic the dynamic, unpredictable environments of daily life. This study bridges that gap by comparing biomechanical data from healthy adults as they perform movement tasks in controlled lab settings versus their own homes, aiming to uncover how real-world surroundings influence rehabilitation outcomes. The objective was to assess how environmental context influences the quality and execution of motor tasks, providing insights into the feasibility of remote monitoring for rehabilitation. Data was collected from healthy adults performing 360-degree turning and sit-to-stand tasks under varied conditions—eyes open, eyes closed, on foam, and on foam with eyes closed. For the turning tasks, completion time, peak acceleration, and peak angular acceleration were measured. For sit-to-stand tasks, movement time was divided into segments: initiation to peak flexion, peak flexion to peak extension, and peak extension to termination. Additional metrics, including peak flexion, peak extension, seat-off, acceleration initiation, and termination, were analyzed. Data from both environments were compared for each metric. We expect to see a difference between the lab and home environments, particularly in acceleration and timing metrics. Because we expect to see a difference between the home and lab environment from healthy participants, we expect to see an even greater difference when looking at the differences from stroke patients. These findings support further investigation into the design and application of home-based monitoring tools for effective stroke rehabilitation tracking.

39. Finding the Determinants of Progress Using Videogame Speedrun History

Presenter(s): Alexis Reeves, Ruby Link, Anne Pham

Advisor(s): Dr. Seth Benzell

We conducted research on speedruns, which are online submissions of players attempting to complete video games as quickly as possible using a variety of tools. We seek to understand the determinants of progress in speedruns over time in order to understand what drives progress in global issues with the uniquely well-documented nature of speedruns as a proxy. To do so, we constructed and cleaned various datasets that trace tool-assisted speedrun submissions, Twitch streams, and GDQ event information back to their corresponding Speedrun game and category from sources like Speedrun.com, TASVideos.org, Games Done Quick (GDQ), and SullyGnome (a Twitch data aggregator). These datasets allow us to analyze factors that influence the rate at

which progress is made and speedrunners break records. Some of these factors include variables such as game popularity, hours of Twitch streams, game genre, whether there has been a GDQ event for the game recently, time since release, and year of release. To demonstrate the effects of these factors on progress, we created graphical representations of how hours viewed of a game affect outcomes to test the hypothesis that streamers with more viewers are more likely to set a new record, among other interesting visualizations. We plan to explore the direct effect of these determinants on overall speedrun progress as well as analyze interaction effects among the determinants.

English

40. Embracing the Outcast: Queer Creatures and the Radical Art of Being a Bitch in Queer Generosity

Presenter(s): Diana Montiel Guzman

Advisor(s): Dr. Ian Barnard

Words like “bitch,” “creature,” and “mean” have long been used to punish those who refuse to conform. Rather than conforming to expectations of politeness, queer individuals, particularly queer femmes and BIPOC, embrace their otherness as part of a rhetorical strategy that refuses erasure. Drawing from Kimberly Gunter’s concept of queer generosity as care through resistance, Myriam Gurba’s memoir “Mean,” and Joshua Raclaw’s work on linguistic reclamation, this project explores how rhetorical acts of defiance reclaim slurs and socially marked identities as strategies for survival, connection, and self-determination. This work expands the discussion by focusing on how rhetorical reclamation of the outcast figure and the “Other” functions to disrupt social norms, create community, and act as a form of care through resistance. By doing so, it offers new concepts such as how meanness, monstrosity, and misbehavior function as tools for survival, resistance, and self-expression. By embracing what society labels as deviant, queer rhetors generate new meaning and presence through intentional acts of defiance. The outcast figure becomes a method for challenging dominant narratives and reimagining power through refusal. This research turns to queer writing, personal narrative, and memoir to examine how these rhetorical acts appear in everyday life revealing how public acts of defiance push back against heteronormative and white supremacist values that shape who is allowed to speak and belong. By using language meant to exclude, queer rhetors create space for themselves and others who have been pushed to the margins. This project argues that these rhetorical acts are not only powerful but generous, offering alternative ways of being that make room for truth, rage, and care to coexist.

41. Queerness in the Ability to Choose

Presenter(s): Haley Kamola

Advisor(s): Dr. Ian Barnard

This presentation delves into examples of LGBTQ+ authors and characters within the choose your own adventure genre. With a primary focus on Anna Anthropy's story game "queers in love at the end of the world" and Carmen Maria Machado's memoir *In The Dream House*, instances of queerness found within the choose your own adventure genre are analyzed. Anthropy's story game depicts two women with ten seconds to live until the world ends. The story game itself only exists for ten total seconds before players are given the chance to restart and try again. Machado's memoir retells her experience in an abusive relationship with a woman, but told through various story tropes and genres. The chapter "The Dream House as Choose Your Own Adventure" depicts a day in the life of Machado and her abusive girlfriend. Anthropy's identity as a transgender woman and lesbian, as well as Machado's bisexual identity, are taken into consideration. How might these women have felt trapped within their lives, and wished they had the opportunity to try again? As this genre is typically reserved for children's books and video games, any occurrences outside of the norm are studied with the driving question: why are LGBTQ+ people so drawn to the choose your own adventure format?

42. Queering Shakespeare: An Analysis of "Fat Ham" and How Its Reconstruction of Canonical Shakespearean Texts Affects Queer Culture

Presenter(s): Izzy Geldbach

Advisor(s): Dr. Ian Barnard

Shakespeare's work has withstood the test of time, lasting 400 years; his work is admired and studied by a broad audience, from scholars to adolescents. Although the language verges on flowery, embellished, and challenging to understand for modern audiences, the human experience keeps bringing us back to these timeless stories. Shakespeare intended for his pieces to reflect the human condition, a universal tale that all could relate to. As years passed, audiences found ways to adapt these shows to suit modern audiences. Popular movies such as *10 Things I Hate About You* (1999), *She's the Man* (2006), and *Romeo + Juliet* (1996) are all examples of how Shakespeare's themes resonate with any audience, regardless of time or culture. The emotional connection to the plot and characters is ageless.

However, there is a more impactful form of reimagining Shakespearean texts, and that is through a queer lens, more specifically, the play *Fat Ham* by James Ijames, which is a modern adaptation of Shakespeare's classic, *Hamlet*. *Fat Ham* was first performed in 2021 and debuted on Broadway in 2023. Along the way, the play won a Pulitzer Prize in Drama (2022). This adaptation follows Juicy as he navigates his life as a gay man at his family BBQ in the South. Ijames explores classic language in the context of Juicy, what it means to "be a man," and how he must abandon his "softness" to succeed in the world and his family's eyes.

Centering Shakespearean adaptations around queerness is not just a form of rhetorical dissonance but a significant historical shift. The dissonance between old and new themes creates

a far richer story that challenges old themes with new imagery and language. 'Queering Shakespeare' is an effective form of adaptation because it not only acknowledges and affirms Shakespeare's themes of characters exploring gender and same-sex relationships but also challenges tradition. By amplifying queer voices and culture, it reaffirms their place in history and sparks a broader dialogue about queerness in other historical texts.

43. Identity, Migration, and Folklore in Jamaican Postcolonial Literature: A Reading of Paulette Ramsay's "Aunt Jen"

Presenter(s): Emily McEachin

Advisor(s): Justine Van Meter

This project examines the formation of identity in "Aunt Jen," a coming-of-age novel set in post-independence Jamaica, by exploring how colonialism, migration, and folklore shape the protagonist's sense of self. Centering on the character Sunshine, the novel unfolds during Jamaica's political and economic upheavals of the 1970s, including the rise of Michael Manley and the People's National Party, depicting both the hopes and disillusionments of a young nation. Sunshine's story parallels these challenges as she navigates her fractured self-image, intensified by the absence of her mother, Aunt Jen, who emigrated to England to escape Sunshine's father and her internalized colonial ideals. Drawing from scholars such as Stuart Hall, this analysis situates Sunshine's journey within the broader Caribbean experiences of migration and colonial identity loss. I highlight how Sunshine's identity is shaped not only by historical forces but also by folkloric tradition, as figures like Anansi and River Mumma serve as both narrative devices and psychological tools that help Sunshine cope with abandonment and reclaim her agency. By blending folklore with postcolonial themes, this project contributes to broader discussions on identity, migration, and the transformative power of storytelling in Caribbean literature.

Food Science

44. Cysteine and Glutathione Inhibition of Redness, Browning, and Advanced Glycation End-Products in Chlorogenic Acid/Glucose/Tryptophan Solutions

Presenter(s): Annette Nguyen

Advisor(s): Dr. Lilian Senger

Red 40, an artificial dye used commonly in many of the foods we eat today, has been found to be carcinogenic, creating the need to find a healthier alternative to replace the red coloring of these foods to maintain their appeal. The reaction between chlorogenic acid (CGA) and tryptophan (Trp) in alkaline environments of pH 9 produces an intense, red pigment, raising the question of whether this reaction can sufficiently replace Red 40 as a natural food dye. In addition, brown coloration of foods increase appeal to consumers. A Maillard reaction occurs between amino acids and sugars to produce browning, contributing to flavor and aroma, as well. However, this reaction also forms advanced glycation end-products (AGEs), which, like Red 40, may induce

cancer progression, but the addition of thiols, in this case, cysteine (Cys) and glutathione (GSH), has been shown to decrease AGEs. In this experiment, the combination of chlorogenic acid, glucose, tryptophan, and successive, yet varying, concentrations of the thiols were tested in both pHs of 7.4 and 9 at 37°C for up to 48 hours using a microplate reader. Redness and browning were measured as absorbance while AGE formation was measured as fluorescence. The experimental results demonstrated that redness, browning, and AGE formation increased overtime, and that thiol concentration and strength of coloration had an inverse relationship. However, thiol concentration did not necessarily have an inverse relationship with AGE formation as expected. Further research is needed to explain whether there is an optimal thiol concentration to effectively decrease AGEs whilst stabilizing color formation.

45. Authentication of Grass-finished Beef Using Gene Profiling

Presenter(s): Chloe Castanon

Advisor(s): Dr. Rosalee Hellberg

Summary: This study investigated the use of quantitative gene expression analysis to authenticate grass-finished beef and distinguish it from other feeding systems. Results showed significant upregulation of genes involved in animal health, fatty acid metabolism, vitamin co-factors, and phytochemicals. These findings support the development of reliable authentication methods to enhance producer credibility and consumer confidence. Research demonstrates that cattle grazed on phytochemically diverse pastures results in beef that aligns with human health recommendations—boasting a lower omega-6:omega-3 (n-6:n-3) ratio (approximately 2:1) compared to grain-finished beef. However, a recent nutritional survey revealed significant variations in n-6:n-3 ratios among grass-finished beef from different U.S. producers. Additionally, the U.S. market imports 70-80% of its grass-finished beef, raising concerns about the accuracy of producers' claimed grazing practices. This highlights the need for reliable methods to authenticate grass-finished beef and distinguish it from other feeding systems. This study used 54 Red Angus steers randomly allocated to one of three finishing diets: 1) grazing a biodiverse pasture (GRASS), 2) grain in feedlot (GRAIN), or 3) grain in feedlot + grape seed extract (GRAPE). Real-time PCR was performed on cDNA extracts from frozen ribeye samples (n=54) targeting four genes (EIF4EBP1, ALAD, NPNT-1, PPARG) and two reference genes (YWHAZ, RPLP0). Relative gene expression was calculated using the $\Delta\Delta C_t$ method. Statistical analysis included a linear regression model (diet, year, pen as fixed effects; animal as experimental unit) and post-hoc Tukey's tests with Dunn-Šidák correction to compare gene expression across dietary groups. For PPARG, beef from the GRASS group showed significantly higher relative expression than the GRAPE group ($p = 0.038$). For EIF4EBP1, ALAD, and NPNT-1, GRASS beef consistently exhibited higher relative expression compared to GRAIN and GRAPE ($p \leq 0.05$ for all), with no significant difference

Health & Strategic Communication

46. T-score and Median Household Income to Evaluate Public Health Outreach Efforts Across Socioeconomic Strata

Presenter(s): Jody Goldman, Jess Furman, Tara Dunne

Advisor(s): Dr. Frank Frisch

This study evaluated the correlation between socioeconomic status and bone health because the prevailing assumption is that elevated socioeconomic standing is linked to higher-quality health outcomes. Bone health was evaluated through the relationship between states of affluence, measured by census information and T-scores. The mean and median T-score and the data's standard deviation and r-value were calculated. The r value was 0.110, indicating little correlation between socioeconomic status and bone density. Public health outreach efforts must be targeted to all communities regardless of socioeconomic status or access to healthcare, as they are not factors in bone density outcomes. Education is a universal tool that is not limited based on socioeconomic status.

History

47. Acting Religion: Analyzing the AIDS Crisis through a Religious Lens

Presenter(s): Anya Nguyenkhoa

Advisor(s): Dr. Jeffrey Koerber

Human immunodeficiency virus, also known as HIV, is a retrovirus that attacks the immune system and is contracted through the exchange of bodily fluids like blood, breast milk, and semen. Acquired immune deficiency syndrome, or AIDS, is the most advanced stage of HIV, when the infections go untreated. First diagnosed in 1981, the association of HIV/AIDS with homosexuality led the country down a dangerous path as systemic barriers to comprehensive research, treatment, and a cure were constricted due to homophobia. For patients with AIDS, besides medication, the best treatment was community support. Whether it came from their partners, peers, families, or religious institutions, communities across the country came together to provide aid and care. My research project seeks to analyze the different religious understandings of AIDS and the following reactions of various faith groups. While religious constructions of AIDS are complex and varied, relations between people with HIV/AIDS and faith groups can be organized into three categories: accusations, assistance, or acceptance. When patients are accused, as Christian fundamentalist groups did in the 1980s, AIDS is interpreted as divine punishment, as failure to comply with traditional norms of sexual morality is punishable by death. When patients are assisted, AIDS is acknowledged as a medical matter rather than a moral matter, and compassion is urged for people with AIDS. When patients are accepted, as occurred under Buddhist understandings of illness and the embracement of suffering, the topic of sexual morality

is removed from the conversation and thus not associated with AIDS. When it comes to religious reactions to the AIDS crisis, the conservative words of Christian leaders are quick to be recalled in public memory. Still, this paper goes to show that religious groups like the Buddhists and Reform Jews were otherwise progressive in their frameworks and care.

48. The Cultural Revolution in China and the Motives of its Participants

Presenter(s): Austin Wang

Advisor(s): Dr. Jeffrey Koerber

My project examines the Chinese Cultural Revolution during the late 1960s, where widespread chaos spread throughout the country after Mao called upon revolutionary cadres to root out all anticommunist elements in China. I focus on why and how the general population, consisting of workers, peasants, and students, responded to Mao's call for rebellion as well as how these individuals were affected by the events that unfolded. More specifically, what were some of the motives behind the participants of the revolution, whether it be political, personal, or any other factors? To accomplish this, I look into oral histories of eyewitnesses to understand how different groups of people acted and engaged with the Cultural Revolution. This includes testimonies from both actors and victims, which I will be using to find out how different individuals were affected by the actions committed during the time period. Many underlying motivations prompted historical actors to commit the actions that they did. This includes peer pressure, the need to prove their loyalties, not wanting to become a victim, wanting to advance their own social statuses, and the desire to inflict harm on someone else due to personal grudges. As a result, the motives behind participants in Mao's Cultural Revolution were not purely political, as many different cultural, historical, and societal factors also influenced these individuals.

49. Kameraden: German Jewish World War I Veterans under the Nazis

Presenter(s): Brandon Boccio

Advisor(s): Dr. Jeffrey Koerber

This research paper analyzes how male German Jewish World War I Veterans responded to being legally excluded from the German nation due to the Nazis' racial antisemitic ideology. The primary hypothesis of this paper is the deeply personal challenge that confronted male German Jewish World War I Veterans between their patriotism and nationalism and the decision to abandon Germany under the Nazis. The breaking point that forced most to reject their German identity and flee their country was "Kristallnacht", the Nazis' nationwide pogrom against Jews in Germany in November 1938. This historical event marked the ultimate "social death" for the Jews, their near-total social isolation, and most Jews felt they could no longer survive within the German nation. Many were desperate to emigrate at this point, with the caveat that those who converted to Christianity and married non-Jews primarily chose to remain in Germany as seen in the case of Victor Klemperer. The primary sources used in this paper include the following: the World War I recollections of Arnold Tänzer, a German Jewish rabbi; an interview from the USC Shoah Foundation Visual History Archive of Evelyn Rubin, daughter of a German Jewish war veteran; and

the diaries of Victor Klemperer, a German Jewish literary scholar whose diaries were published long after his death in the 1990s. The secondary sources for this thesis include a wide variety of articles, journals, and books by notable experts in the field of Holocaust history and the history of German Jews.

50. Comfort Women Statues: Memory and Politics of the East Asian American Diaspora

Presenter(s): Daniel Kim

Advisor(s): Dr. Jeffrey Koerber

My research analyzes the contrasting Asian-American perspectives on the Korean “comfort women,” who were subject to sexual exploitation by Japanese occupation forces during World War II. After the war, “comfort women” survivors and others advocated for the memorialization of those who experienced the horrors of sexual slavery. Two such markers include the “Comfort Women Memorial,” a bronze tablet in Palisades Park, New Jersey, placed in 2010, and the “Peace Monument,” a statue of a young Korean woman in Glendale, California, unveiled in 2013. Reactions from the Japanese government, Japanese citizens, and some Japanese Americans have been negative. The Japanese military deny that they were involved in the coercion of Korean women into sexual slavery. However, the reaction from Korean Americans have been strong and supportive of these memorial actions. Korean American non-profit groups have worked together with “comfort women” survivors to build these memorials. My poster will examine the controversial reactions and political tensions sparked between Japan and Korea due to the “comfort women” memorials, as well as examine the historical context of Japanese colonialism in Korea from 1910 to 1945.

51. John F. Kennedy: The Cuban Missile Crisis

Presenter(s): Kadie Daniel

Advisor(s): Dr. Jeffrey Koerber

A pivotal moment in the history of the Cold War was the Cuban Missile Crisis of October 1962. This event brought the United States and the Soviet Union face-to-face to the brink of a nuclear conflict. This research will examine what the public had thought about what was happening at the time of the crisis and how President John F. Kennedy specifically responded to the Soviet Union's threats. The United States' discovery of nuclear missiles on the island of Cuba, built and controlled by the Soviet Union, began a tense standoff between the two nations. This resulted in the crisis that lasted 13 days with US demands for missile removals, threats of a blockade, and fears of nuclear war. The standoff was settled by an agreement reached through diplomatic negotiations. The United States agreed not to invade Cuba in exchange for the Soviet withdrawal of nuclear weapons from the island. The crisis has had a lasting impact on relations between the Soviet Union and the United States and wider consequences for global security.

52. The Watts Riots in the Black and Mainstream Press

Presenter(s): Reed Peterson

Advisor(s): Dr. Jeffrey Koerber

This research poster will analyze the difference between how mainstream and black newspapers reported on the events of the Watts Riots in the 1960s to show biased and racist reporting from mainstream newspapers. The Watts Riots was a series of riots from August 11 to 16 in Watts, Los Angeles that killed over 30 people, injured thousands and caused millions in damages to the city. The riots were centered around police brutality towards the black community in Los Angeles and was part of the larger American Civil Rights movement. The black and mainstream newspapers that will be covered will come from Los Angeles and Chicago through the Proquest historical newspaper archives to reach a national understanding of how black and mainstream newspapers were covering the riots. Black newspapers, or newspapers that are owned and operated by exclusively African Americans, primarily reported on events that specifically concerned their community. Some of the black newspapers that will be examined are the Los Angeles Sentinel and Chicago Defender, and will be examined alongside their mainstream counterparts The Los Angeles Times and Chicago Tribune. An analysis of the two types of newspapers will show that the mainstream newspapers failed to report an unbiased representation of the events of the riots by having a racial bias against the African American victims and rioters, while the black newspapers gave both the African Americans point of view of the riots, as well as the perspective of the Los Angeles Police Department. The impression left by the mainstream press promoted bias and misunderstanding of the Watts Riots.

Peace Studies

53. Shame, Politics, and Social Movements: A Comparative Analysis of the U.S. and Vietnam

Presenter(s): Karly Redeman

Advisor(s): Dr. Lisa Leitz

The central question the research sets out to understand is "How does shame in political contexts compare between U.S. and Vietnamese cultures?" This research explores shame's various and multifaceted perspectives, comparing its role and manifestations within a US and Vietnamese political setting. Using qualitative comparative analysis, the study looks to identify similarities and differences among the cultures, drawing from scholarship from diverse disciplines and theories such as feminist theory, cultural studies, and psychoanalytic theory. By examining these theoretical and thematic frameworks, the study seeks to understand how shame influences political attitudes, public behavior, and emotional dynamics within social movements. Furthermore, the work narrows in on the implications of this for social movements. By exploring the intersection of shame and social movements in U.S. and Vietnamese contexts, we can see how emotions shape collective action and mobilization. The study aims to illustrate how shame functions as a unifying and divisive force, influencing group identity and strategies to create

nonviolent social change. The study findings are expected to reveal how shame can be used to empower or disempower the masses, depending on the context within the movement in which it is employed. This research contributes to existing work surrounding emotions in social movements and political behavior. Additionally, it provides insights into the emotional habitus, such as how shame can guide, sustain, or hinder collective efforts for change.

Pharmacy

54. Extraction and Proteomic Profiling of Black Seeds (*Nigella sativa*) by Tandem Mass Spectrometry

Presenter(s): Paulla Banatin, Winnie Fei

Advisor(s): Dr. Aftab Ahmed, Basir Syed

Herbal medicine has been used since ancient times and has served at the forefront of medicine. According to the World Health Organization (WHO), it is estimated that around 88% of the global population uses herbal medicine. Approximately 40% of modern medications today are derived naturally from plants. In traditional medicine, the use of black seed has been most prominent in Arabian countries, and it is often used for various ailments such as bronchitis, asthma, and diarrhea. Black seed has been comprehensively examined and known to exhibit antihypertensive, antidiabetic, and anticancer properties. Our group has published the antiproliferative and apoptotic effects of black seeds (*N. sativa*) on the human breast MCF-7 cancer cell line. This study focuses on proteomic profiling through size exclusion chromatography, affinity chromatography, high-resolution ESI QTOF LC/MS/MS, and bioinformatic tools to evaluate black seed De Novo protein sequencing. The protein extraction was achieved in 20 mM Tris/HCl pH 8. The protein purification was conducted using gel filtration chromatography (SEC) on the Superdex-75 column and affinity chromatography on the HiTrap Blue Sepharose column. The crude protein and the chromatography fractions were digested with trypsin and successfully analyzed by LC/MS/MS. The peptide mass fingerprint analysis was done using the De Novo sequencing bioinformatic tool PeakStudio-X. The bioinformatics analysis using the SwissProt Viridiplantae database with FDR \leq 1% revealed 81 proteins in the case of SEC; in contrast, affinity chromatography showed 50 protein groups and a total of 126 proteins respectively. Work is in progress to evaluate the cytotoxic activity.

55. Mechanistic Studies of Next-generation Antibiotics

Presenter(s): Mariam Elrabat

Advisor(s): Dr. Marco Bisoffi, Dr Sherif Elshahawi

The increasing prevalence of antibiotic-resistant bacteria necessitates the development of novel antimicrobial agents with alternative mechanisms of action. This study evaluates the bactericidal effectiveness of two antibiotics, Dap and Dap2P, against *Staphylococcus aureus* strains 1715 and 880, and *Enterococcus faecalis* strains 334 and 335. A time-kill assay was utilized to assess

bacterial viability at 30 minutes, 2 hours, 4 hours, and overnight following treatment with a range of concentrations of the drugs, both in the presence and absence of calcium.

Colony-forming units (CFUs) were counted from each bacterial plate at each time point to quantify bacterial survival over time. Alongside this, fluorescence microscopy using a Keyence microscope was used to visualize and analyze cellular viability, with blue, green, and red light filters employed to distinguish live, compromised, and dead cells. Employing both methods allowed for quantitative and qualitative visualization of the two drugs across various conditions. Results demonstrated that Dap2P exhibited greater bactericidal activity compared to Dap, with the most evident effects observed under calcium-supplemented conditions. The combination of Dap2P and calcium significantly reduced viable cell counts across all tested strains and time points, with the most sizeable reductions seen in the overnight samples. The findings suggest a potential synergistic interaction between Dap2P and calcium, enhancing the antibiotic's ability to eliminate both *Staphylococcus aureus* and *Enterococcus faecalis*.

These results support Dap2P in combination with calcium as a promising candidate for further investigation in the treatment of antibiotic-resistant infections. The time-dependent killing mechanisms and consistent microscopy observations highlight this combination's rapid effects. Additionally, the improvement in effectiveness with the addition of calcium illustrated the importance of optimizing co-factors while developing next-generation antibiotics to combat bacterial resistance.

Physical Therapy

56. Trends of Critical Flicker Fusion Frequency among Healthy Young Adults

Presenter(s): Jolea Hutt, Alohi Sheung, Michelle Lee

Advisor(s): Dr. Rahul Soangra

This project investigates how Critical Flicker Fusion (CFF) frequency changes throughout the day in healthy young adults. CFF is where a flickering light appears steady and it is used to measure visual processing speed and neural efficiency. While catabolic hormones and enzymes like cortisol and salivary amylase are known to follow daily cycles connected to the circadian rhythm, it's unknown whether CFF follows a similar pattern or stays constant throughout the day. Past research shows that CFF can decrease with fatigue and increase when stressed or aroused, but there is little that is known how CFF frequency changes. In our pilot study, we tested healthy young adult participants hourly for at least seven hours using the Lafayette Flicker Fusion System, where both eyes receive the flickering light at the same time. Each hour, participants completed three rounds of the "Simple Flicker" task and three rounds of the "Simple Fusion" task. Averaged results were used to obtain a CFF value for each time point. Graphs were then created to visualize the patterns of CFF. If CFF shows consistent changes, it may point to underlying circadian or stress related patterns. If it remains stable, it could suggest CFF is not influenced by time of day. There is no current method to identify Parkinson's disease before motor symptoms emerge. When

motor symptoms such as tremors or postural instability are presenting, substantial irreversible damage has already occurred. Our hope is to establish baseline CFF patterns along with their natural variations in healthy young adults. Future research can then explore how CFF measurements might serve as a non-invasive indicator of neurological changes, potentially detecting abnormalities long before clinical symptoms emerge. This research carries significant implications as it also advances our understanding of how basic visual processing reflects overall neural health in clinical and everyday settings.

57. Stroke McRoberts

Presenter(s): Natalie Nguyen, Tania Ng, Pasant Moanes

Advisor(s): Dr. Rahul Soangra

The McRoberts Stroke Monitoring Belt is a wearable device designed to monitor and enhance the rehabilitation process of stroke survivors through the tracking of their daily activities and living. Given that approximately 15 million people suffer a stroke each year, stroke survivors often face challenges in performing daily activities, leading to reduced mobility and overall quality of life. Monitoring physical activity is crucial for tracking stroke survivors' progress during rehabilitation to assess recovery accordingly. The McRoberts stroke belt collects data continuously throughout a survivor's day over a course of fifteen days to provide insight into various aspects of their routine, including sleep, steps, and their everyday activity. The aim of this review was to measure the rehabilitation progress of stroke survivors and to collect data by tracking these activity patterns. Preliminary findings suggest that stroke survivors using the belt exhibit significantly lower step counts compared to other activities. By integrating continuous monitoring into stroke survivors' daily routines, the McRoberts Stroke Monitoring Belt offers valuable insights into how they are performing in their daily lives, allowing for the enhancement in the quality of life for stroke survivors.

58. Balance, Sensory Integration, and Perception in Stroke Survivors

Presenter(s): Navya Sharma

Advisor(s): Dr. Rahul Soangra

This project examines the physical and cognitive deficits stroke survivors face by evaluating their sensorimotor integration, balance control, and subjective perception. During voluntary movement and balance, the brain integrates a variety of sensory inputs. After experiencing a stroke, this ability may be disrupted, which can significantly impair postural stability and increase fall risk. We use the modified Clinical Test of Sensory Integration and Balance (mCTISB) to analyze postural control under varying visual and proprioceptive conditions. Postural balance metrics are quantified using a force plate, allowing for an in-depth analysis of sway velocity, center of pressure (COP) excursion, and asymmetrical weight distribution. Participants are evaluated on both a flat surface and a foam pad, undergoing each condition both with and without visual input. Additionally, subjective data on participants' perceived stability and daily confidence is collected through structured surveys such as the Activities-specific Balance Confidence (ABC) Scale. By

integrating objective biomechanical data with subjective self-reporting, we aim to assess both the physical and cognitive components of balance impairment post-stroke. We hypothesize that stroke survivors will demonstrate greater postural instability in sensory-conflicted conditions and report lower confidence in mobility tasks when compared with healthy controls. These findings may guide the development of more targeted rehabilitation strategies that focus on restoring sensorimotor integration and enhancing both physical and cognitive recovery outcomes.

59. Variance in Heart Rate Variability Between Healthy and Concussed Individuals

Presenter(s): Sebastian Herrera Vargas, Joonsuk Choi

Advisor(s): Dr. Rahul Soangra, Dr. Brent Harper

Heart-Rate Variability (HRV) is the interval between each individual heartbeat, from p-wave to p-wave on an electrocardiogram (ECG). In general, a high HRV indicates that a person has a healthy heart with effective stress management skills. This value means that one branch of the nervous system is not overpowering the other, sympathetic vs parasympathetic—for example. Generally, HRV is related to vagal tone, the ability for your body to activate the parasympathetic system and relax when imminent danger is not present. However, when someone is concussed, the entirety of their autonomic regulation can be affected such that their HRV is altered. A meta-analysis conducted by Arakaki et al. suggests that “high HRV links with better executive function, decision-making ability, and emotional regulation that benefit health and wellbeing” (Arakaki et al, 2023). This study suggests that there is a strong bidirectional relationship between the heart and brain, thus it is important to understand what the physiologic effects on the cardiovascular system and the rest of the body are when a patient has been concussed. Therefore, our experiment aims to evaluate autonomic nervous system (ANS) function by analyzing HRV parameters in individuals with and without a history of concussion. We will analyze the data collected from wearable devices that capture PPG (Photoplethysmography) ECG signals to identify ANS dysfunction, potential biomarkers for concussion recovery, and implications for physiological and cognitive rehabilitation strategies.

60. Subjective Measures of Confidence, Mobility, and Well-being in Stroke Recovery: Implications for Tailored Rehabilitation

Presenter(s): Shelby Hext, Brooke Waite

Advisor(s): Dr. Rahul Soangra

Subjective surveys play an important role for capturing patient-reported outcomes that reflect stroke survivors' self-perceived confidence, mobility, and psychological well-being. By collecting patient -reported outcomes, the surveys provide insight into how individuals perceive their recovery progress and the challenges they face in daily life. We used a combination of balance confidence (ABC scale), quality of life (Stroke QOL), Stroke Impact Scale (SIS), executive function (Trail Making Test), cognitive screening (MOCA), and mental health evaluation (Depression Scale), this study will provide a multi-dimensional understanding of stroke recovery. Preliminary findings from ongoing data collection suggest that lower scores may be indicative of reduced functional

mobility, diminished confidence in activities of daily living, and elevated risks for mental health concerns such as anxiety or depression. Conversely, higher scores could indicate improved self-efficacy and greater independence. These subjective metrics have the potential to directly inform and refine rehabilitation strategies by enabling clinicians to tailor interventions to the unique needs of each patient. Systematic analysis of these responses may uncover trends that support more effective treatment planning and ultimately enhance functional outcomes and quality of life for stroke survivors.

Physics

61. Decomposition and Oxidation of Methanol on Platinum

Presenter(s): Serena Wamba Fosso

Advisor(s): Dr. Jerry LaRue

Catalysts, which accelerate chemical reactions without inflicting permanent changes, are crucial in industries such as energy production to pharmaceuticals. However, some parts of the fundamental steps that drive the catalysts have yet to be fully understood. Gaining deeper insight into these fundamental mechanisms is vital for developing more selective and efficient catalysts. This research focuses on the decomposition and oxidation of methanol on platinum (Pt) surfaces, a reaction that serves as a model system for understanding catalytic behavior in energy-related applications. Methanol decomposition involves several stages, including adsorption, dissociation, intermediate formation, and the desorption of products. These stages are influenced by variables such as surface structure, temperature, pressure, and molecular coverage. To investigate these dynamics, we employ ultra-high vacuum (UHV) conditions and a range of techniques: temperature-programmed desorption (TPD), sum-frequency generation (SFG) spectroscopy, x-ray spectroscopies. These methods will help us characterize the platinum surfaces and map reaction channels. This research investigates methanol decomposition on various platinum surfaces, including flat (terraced) and highly stepped surfaces, under varying methanol coverage and in the presence of co-adsorbed atomic oxygen. In support of these experiments, multiple software programs are used to control hardware, collect data, and monitor experimental parameters like temperature, pressure, and TPD output. However, these programs were not originally designed to operate simultaneously or to share information. My role involves developing a more integrated system by implementing multiprocessing techniques to allow the programs to run in parallel, share data efficiently, and avoid conflicts, particularly those caused by simultaneous access to shared ports or resources. This work not only improves experimental efficiency and reliability but also lays the foundation for real-time broadcasting of environmental conditions such as temperature and pressure.

Political Science

62. The Effects of Democratic Backsliding on Public Opinion in Tunisia and its Implications for the Future

Presenter(s): Mia Coots

Advisor(s): Dr. Andrea Molle

Since gaining independence from France in 1956, Tunisia has demonstrated a consistent commitment to democratic ideals. This dedication endured through the rule of two authoritarian presidents and culminated in the 2010 Arab Spring, during which Tunisians successfully overthrew their long-standing president in 2011. In 2014, a new democratic government was established, marked by the adoption of a progressive constitution and the conduct of free and fair elections that led to the formation of a new parliament and presidency. Tunisia's democratic experiment persisted throughout the following decade, weathering the death of its first democratically elected president and the subsequent election of President Kais Saied in 2019. However, on July 25, 2021, President Saied orchestrated a self-coup, effectively consolidating power by sidelining other branches of government and curtailing popular political participation. Over the subsequent four years, Tunisia's democratic institutions have eroded significantly, prompting international concern regarding the country's democratic status. This paper seeks to examine the impact of President Saied's authoritarian actions on public opinion toward both the government and the broader concept of democracy. Drawing on public opinion data, I hypothesize that while the coup has fostered growing dissatisfaction with the current government, it has simultaneously strengthened public support for democratic principles. Supplementary evidence from electoral behavior and protest activity further suggests that popular disapproval of the coup is being expressed through alternative channels. Ultimately, this study aims to explore the future trajectory of Saied's regime and assess the prospects for democratic restoration in Tunisia.

63. What Factors Determine How Voter Behavior Fluctuates Within Public Elections?

Presenter(s): Amelie Van Dooren

Advisor(s): Dr. Ann Gordon

By allowing voters to choose among candidates that offer different policies and ideas, elections are a vital method to ensure that the government's actions align with the electorate's preferences. In this research, I investigate the factors that most significantly affect voter behavior from election to election and how these influences fluctuate over the years. While pulling from various political theories and political psychology, economic conditions, candidate traits, and the media's influence, I argue that although core determinants of voter behavior are consistent, the shifts and influences strongly depend on the economic and political context. While using data from elections over the years, I delve into how changes in current events, the economy, media narratives, and political polarization affect voting patterns over different election cycles. For instance, by comparing research findings from a recent study on voting behavior across various

global elections, "Voting contagion: Modeling and analysis of a century of U.S. presidential elections," and other sources, I examine how external factors like campaigns, media, and anything shaping the image of each candidate contribute to voter turnout and decisions. While socioeconomic trends influence voting trends, candidates' ability to reach their audience and tap into public opinion significantly sway electoral results. This research explores a deeper understanding of what influences voter preferences. It showcases how they are not static but depend on the political, media, and economic factors and the nature of political representation in elections.

64. Conspiracy Theories: Is the Media Manipulating the Electorate?

Presenter(s): Andrew Robles

Advisor(s): Dr. Ann Gordon

Conspiracy theories are not a new addition to the world or to America; we have seen such theories arise after the assassination of President JFK, the terrorist attacks of 9/11, and the ever-prevalent belief in the Illuminati. However, significant increases in usage and consumption of news through social media in recent decades have seemingly propelled conspiracy theories to be at the forefront of many people's minds. This study examines and compares how the heavy use of social media and traditional news outlets affects people's willingness to believe in various conspiracies. To accomplish the goals of this study, I will be using data derived from the nationally renowned Chapman Survey of American Fears, a representative national sample of U.S. adults. In this paper, I expect to find a contrast between the effect of social media on conspiracy theories and that of traditional news outlets to show if certain political ideologies are more likely to be convinced to believe in a conspiracy theory through social media or more traditional news outlets. I also expect to find that the belief in conspiracy theories affects people's voting behavior. Among the early findings in this study, I have found that heavy use of social media equates to a higher belief in conspiracy theories. Although history tells us that conspiracy theories have always existed and will almost assuredly continue to exist, the research done in this paper aims to begin the conversation on whether the media is using conspiracy theories to manipulate the electorate.

65. Nation in Fear: How Illegal Immigration Shapes White American Perceptions

Presenter(s): Emily Yem

Advisor(s): Dr. Ann Gordon

America is changing, and many fear the coming results. Illegal immigration has become a highly controversial and debated issue, which has sparked conversations about changing American demographics. I propose White Americans are fearful of losing their majority status and illegal immigration has become a factor to contribute to that fear. In order to support my research, I use the Chapman University Survey of American Fears. The survey is a nationally representative sample of American adults. While reading the American Fear Survey (2023), I noticed something interesting in the various responses. Americans were asked how fearful they were of illegal immigration, and 55.4% of participants expressed some level of fear. Then, participants were also

asked how fearful they were about White Americans no longer being the majority. It resulted in 24.4% of the participants expressing some level of fear. I found this interesting because it shows that this fear is real and existent. I expect to find a bridge between the two topics, proving immigration is a variable in some Americans' fears. I want to see how the changing state of illegal immigration leads to even becoming a fear. By researching a connection between the two fears, I will contribute to the scholarly discussion of political opinions in America. My research can help understand when political campaigns emphasize the importance of these fears. Most of all, we will have an in-depth understanding of how immigration shifts national discussion and influences policies.

66. The Politics of Change: Ideology and Tolerance for Violence

Presenter(s): Karissa Perez

Advisor(s): Dr. Ann Gordon

While it is commonly believed that ideology is more than just a set of values, it plays a role considering the extent to which individuals support violence to bring about beneficial changes in US institutions and laws is a significant distinction that is often overlooked. The role of ideology in tolerating violence to achieve political goals and address societal issues. There are varying thresholds for acceptable political activism and radical action within the American political landscape will be highlighted. The willingness to support violence as a legitimate tool for change raises questions about stability, as well as the potential risk for escalating conflicts and divisions within society. Using the Chapman Survey of American Fears (CSAF), which collects data from a representative national sample of Americans on over ninety fears and related behaviors, alongside insights from additional research articles, I expect to find that Republicans are more likely than Democrats to justify the use of violence to change U.S. laws and institutions. This support reflects fluctuations in American citizens' nationalism, influenced by their ideology and the president in office. Including political polarization appearing more rooted in partisan group identity than in public policy preferences.

67. Partisanship and Public Health: Understanding Vaccine Hesitancy and Autism Fears

Presenter(s): Maddison Lara

Advisor(s): Dr. Ann Gordon

In this paper, I will analyze how differing partisan ideology affects citizens' trust in vaccines and further understand why they believe it is a direct cause of autism. Based on the data in the Chapman University Survey of American Fears, a nationally representative sample of U.S. adults, I can examine and assess why individuals are convinced autism is a possible complication of vaccination. I expect to find that individuals with lower trust in the institutions that create and distribute vaccines are more likely to believe that vaccines result in autism. Level of education, media consumption, and political party ideology contribute to this belief. The consequences of misinformation not being corrected and further resistance to vaccination are vast. Possible health issues can arise, and current complications will only grow if the problem of understanding the

importance and purpose of vaccines is not resolved promptly. Surveys concerning partisan ideology, education, media consumption, and demographic region can help determine what factors are principal in continuing these misconceptions. Addressing where the miscommunications are allows a response that successfully combats it and puts an end to the problem. Health organizations will have the information needed to effectively advocate for trusted institutions and educate citizens on the importance of vaccinations. Additionally, they can explain how individuals will secure society, the economy, and their lives by getting vaccinated. This research will help bring light on factors contributing to misinformation from conspiracy or fear about the harmful effects of vaccination.

68. Gendered Responses to Fear: Exploring the Relationship Between Mass Shooting Anxiety and Firearm Purchases

Presenter(s): Madison Gillis

Advisor(s): Dr. Ann Gordon

Fear is a major motivator in firearm purchases, yet the intersection of fear, gender, and gun ownership remains understudied. This paper analyzes responses to two distinct survey questions: (1) how afraid individuals are of becoming a victim of a mass or random shooting, and (2) how likely they are to purchase a firearm due to fear, in order to investigate whether this relationship differs by gender. Drawing on survey data related to gun culture, gender norms, and fear-based decision-making, this research examines sociocultural and psychological factors driving firearms acquisition as a response to perceived threats. Prior studies suggest men often purchase firearms as symbols of power, protection, and control. Women, however, despite reporting significantly higher levels of fear—especially concerning mass shootings—are less likely to buy guns. For example, women are nearly twice as likely as men to report being “very afraid” or “afraid” of becoming a victim of a mass shooting, yet their likelihood of purchasing a firearm due to that fear is significantly lower. These gendered patterns raise important questions about how social expectations and identity influence both the perception of threat and behavioral responses to it. This study shows a strong correlation between gender identity, fear levels, and firearm purchasing behavior, with findings indicating that gender moderates how fear translates into action. The analysis contributes new insights into how fear functions differently across gender lines, offering a nuanced perspective on gun culture in the United States. By highlighting the tension between fear and behavior in the context of gender, this research informs debates on public safety, gun control, and gendered coping mechanisms. Ultimately, it underscores the need to consider psychological and cultural factors when analyzing the complex motivations behind firearm ownership.

69. "Does Choice of Media Amplify Support for Political Violence?"

Presenter(s): Nathan Palomares

Advisor(s): Dr. Ann Gordon

Acts of political violence have increased in frequency and exposure to American society and media. Violent rhetoric is a common theme among many forms of media Americans consume, including social media platforms, which have become an essential form of media where Americans increasingly get political news information. The events of the January 6 Capitol Riots and the attempted assassination of President Donald Trump in late 2024 show how urgent the rise of political violence is and its destabilization of American Democracy. In this paper, I examine the relationship between what types of news media people consume and its potential to increase people's support for political violence and radicalization. I will also investigate other independent factors, such as economic anxiety and political identification. Using Chapman University's Survey of American Fears original data set, a national sample of U.S. adults, I expect to find a strong relationship between American consumption of political news on social media and 24-hour news networks, particularly media that skews more ideologically conservative and partisan amplifying increased support and approval for acts of political violence. I may also find that strong political identification and high levels of economic anxiety may allow for easier avenues of radicalization, which in turn drive support for and normalize acts of political violence. If we find that news media is leading to an increase in support of violence that threatens our Democracy, an inquiry into possible solutions for how we talk about politics in news coverage should be pursued to save the future of American Democracy.

70. Amplifying Fear? Social Media's Role in Misinformation After Mass Shootings

Presenter(s): Teagan Ryan

Advisor(s): Dr. Ann Gordon

In the event of a mass shooting, social media platforms become a primary source for individuals to seek quick information on the situation. However, these platforms are unreliable as in the event of a mass shooting, multiple suspects are "identified" before authorities can confirm any details while false narratives are spread. In this article, I examine the extent to which media platforms amplify the spread of misinformation and conspiracies on mass shootings. Using data collected from responses to the American Fears Survey (2021) and American National Election Study (2020) on questions regarding conspiracy beliefs, fear of random shootings, and social media usage, I predict that there is a strong relationship between social media use and beliefs in conspiracies on mass shootings. Although it is unrealistic to dismantle misinformation online completely, social media companies should put effort into fact-checking initiatives to control the spread of misinformation on their platforms, preventing public distress.

71. Misplaced Fear? Assessing the Impact of Demographics and Media Consumption on American's Fear of Violent Crime

Presenter(s): Uche Nwadiashi

Advisor(s): Dr. Ann Gordon

In a nation with ideals grounded in life, liberty, and the pursuit of happiness, having a large portion of the population disproportionately living in fear would challenge such ideologies. I will be examining how race, gender, and media consumption are critical factors that play into an individual's level of fear regarding violent crimes. Relying on The Chapman Survey of American Fears, a comprehensive data source that surveys and catalogs the fears of American adults, I analyzed how these varying factors interact with one another. Through careful analysis, I found that despite women's, particularly women of color, elevated fear of violent crime, they are statistically less likely to experience violent crime than their male counterparts. Logically, this leads to the question of why women fear violent crime on such a high level. Although the research has proposed many possible explanations, like the increase of crime media in the past few decades or evolutionary and cultural norms, these elements are insufficient. While they are all valid contributors to the fear of violent crime, the major contributor is that women fear violent crime so severely because they fear sexual assault disproportionately more than men. Knowing that women's fear of violent crime is tied inextricably to fear of sexual assault helps to explain the elevated fear of violent crimes that is not adequately explained by past studies. Cataloging and understanding this data is the first step in bridging this racial and gender divide and eventually finding a way to reduce such fears significantly.

72. Engaging with News and Politics: How Social Media Use Predicts Political Attentiveness

Presenter(s): Albert "AJ" Perez, Portia Piana

Advisor(s): Dr. Lewis Luartz

Does greater engagement with political content on social media predict stronger partisan feelings among American voters? While some research acknowledges the increased influence of social media on political action, the literature remains divided on whether or not social media platforms reinforce or reduce polarization. Some argue that the algorithms used in these platforms reinforce ideological biases, while others believe that exposure to different and diverse views may moderate beliefs. I argue that increased exposure to political content on social media platforms leads to political polarization by reinforcing existing views, political attitudes, and partisan affiliation. To test this, I analyzed data from the ANES 2020–2022 Social Media Study. This study, which is a three wave panel survey that links voter opinion to social media behavior and usage. I focused on two ordinal variables from the study: first, the independent variable, which is to test the impact of interest in keeping up with news, and secondly on the dependent variable, attention to government and politics. I estimated an OLS regression model to examine the relationship between these variables. The regression results showed that interest in keeping up with news was a statistically significant predictor of political attentiveness, with a coefficient of 0.457 ($p < .001$). This suggests that individuals who are more interested in following news are also more

likely to pay attention to politics. This supports the idea that with increased news engagement, which is often viewed on social media, correlates with higher political attentiveness. The model explained approximately 15.85% of the variation in political attentiveness. These findings support the idea that regularly engaging with political content on social media may increase political polarization, furthering the conversation about social media's role and influence in shaping political behavior and what that means for democracy today, given social media's widespread presence.

73. Money and Media: How Visibility Shapes Partisanship in Local Campaigns

Presenter(s): Levi Ramirez Garcia

Advisor(s): Dr. Lewis Luartz

This study investigates how institutional visibility and financial incentives shape candidates' decisions to run as partisan or non-partisan in local elections. Drawing on data from Campaign Finance in Local Elections: An Eleven City Study (1989-2007) and grounded in the work of Brian Adams, we argue that candidates strategically assess the costs and benefits of party affiliation based on the visibility of the office they seek. Offices like the City Council, which garner more media attention, voter interest, and policymaking influence, offer stronger incentives to run as partisan due to the potential fundraising advantages associated with party support. In contrast, candidates for low-visibility administrative positions face limited voter engagement and lower campaign contributions, making non-partisan campaigns a more pragmatic choice. Our regression analysis confirms that City Council candidates are significantly more likely to run with party affiliation, suggesting that campaign viability is not only a function of ideology but also of office prestige, resource availability, and institutional context. These findings highlight the financial and strategic considerations underlying local political alignment and raise questions about equity, access, and the role of party structures in shaping who can afford to run.

74. Significance of Social Media in Relation to Voter Turnout

Presenter(s): Matthew Kraft

Advisor(s): Dr. Lewis Luartz

How does the use of social media platform Twitter influence voter turnout in the 2020 election? Many previous studies have provided research regarding social media and its impact regarding voter mobilization but many fail to focus on the platform politicians use the most, Twitter. This leaves voters with a large gap in information which can often be misleading. This study argues that the use of social media platform, Twitter, impacts voters in a manner making them more likely to vote within the 2020 election. Thus, filling a notable gap by quantifying social media's effect on electoral participation. To further prove this hypothesis, logistic regression analysis will be used. Extracted from "2020 Time Series Study- ANES" referring to datasets (V202541b – "POST: WHICH SOCIAL MEDIA PLATFORMS R VISITED - TWITTER") and (V202109x – "pre-post: summary": VOTER TURNOUT IN 2020"). Preliminary findings suggest a positive correlation between the frequent usage of twitter and 2020 voter turnout, suggesting that usage of twitter mobilizes

voters in the 2020 presidential election. These findings display great importance for the impact of social media campaigns and the mobilization of voters, highlighting potential future research for social media and its impact regarding future campaigns.

75. Democratic Feelings & Presidential Voting.

Presenter(s): Mercedes Bracey

Advisor(s): Dr. Lewis Luartz

What impact does feeling strongly towards the Democratic Party have on the decision to vote for Donald Trump? Literature suggests that feeling strongly towards a political party creates a sense of loyalty and identity with that party, which strongly influences a voter's decision to choose candidates in presidential elections. This suggests that voters will be increasingly polarized to select a candidate of the political party they feel most strongly towards. I argue that feeling strongly towards a party makes you more likely to vote for a candidate, but not by much. Using the 2020 American National Election Studies Time Series Data, I observed the relationship between the feeling thermometers of voters towards political parties in correlation to the candidate voted for in the 2020 presidential election. Specifically, I found that individuals who feel more strongly aligned with the Democratic Party were only 8% less likely to vote for the Republican candidate, Donald Trump, in 2020. My research suggests that although voters will vote for the candidate of the political party they feel strongly towards, the impact is not very large with only a slight decrease in the likelihood of voting for a candidate, opposing the Democratic party. This suggests that while voters evaluate an incumbent's track record in handling their position as president, they are not as strongly aversive as literature and previous research suggest.

76. Digital Pathways to Protest: Internet Engagement and Political Participation in the MENA Region

Presenter(s): Taylor Dyssegard

Advisor(s): Dr. Lewis Luartz

This paper investigates the relationship between internet usage and political participation in the Arab world, specifically asking: Does greater internet usage increase the likelihood that someone will attend a demonstration or protest march within Arab countries? Drawing on data from the Arab Barometer Questionnaire, Wave III through Wave VII, this study explores temporal trends and cross-national patterns to assess the correlation between digital engagement, political involvement and protest activity. The analysis centers on two key variables: the frequency of internet use (variable 222q) as the independent variable, and self-reported participation in a protest or demonstration within the past three years (variable q2302) as the dependent variable. Using Spearman's rank-order correlation to account for the ordinal nature of the data, preliminary results indicate a modest but positive association ($\rho = 0.127$) between internet usage and protest participation. This paper argues that individuals who use the internet more frequently are more likely to engage in protest activity, as digital platforms not only expose users to politically

mobilizing content but also serve as key tools for organizing and disseminating protest information. My initial findings support the hypothesis that increased internet access is linked to higher levels of political mobilization. This study contributes to the existing body of research on the political implications of digital connectivity in authoritarian and hybrid regimes across the Middle East and North Africa and attempts to explore which respondent attributes most strongly correlate with involvement in political demonstrations.

Psychology

77. "Why Would You Make a Comment Like That?": Engaging College Students as Allies through an Evidence-Based Intervention

Presenter(s): Kalya Su, Elyse Tran, Amber Sharma

Advisor(s): Dr. Amy Moors, Dr. Jeremy Hsu

Background: Women, people of color, and LGBTQ+ individuals often experience subtle acts of prejudice (microaggressions) in college settings, which negatively impacts mental health and academic outcomes (Keels et al., 2017). To help improve campus climate, we developed and implemented a 75-minute theoretically grounded workshop to provide students with evidence-based ally strategies. We hypothesized that participants would be more willing to engage in ally behaviors towards LGBTQ+ individuals and people of color experiencing a microaggression after completing the workshop. In follow-up interviews, we examined attendees' retention of the workshop.

Method: We surveyed 168 workshop attendees about their attitudes and ally behaviors before and after attendance. Three months later, we conducted in-depth interviews with eleven randomly selected participants (nine women; two men). In the interviews, we provided one case study where a nonbinary individual was greeted by another person saying, "hey man!" and, in another, a White male student was shocked when an Afro-Cuban female student received an A+ on a research class midterm.

Results: Preliminary results from the pre-post surveys indicate participants felt more confident engaging as an ally and reported more ally behaviors after attending the workshop (small to moderate effect sizes, all p-values <.05). Across the interviews, participants who connected with the identity of the victim or perpetrator were likely to speak up. In the misgendering scenario, seven out of eleven participants claimed they were unsure if they would intervene during a real situation. However, in the racism and sexism case study, nearly all participants agreed that they would intervene if the situation were real.

Conclusion: Given the current targeting of college campuses' DEI programming, it is critical to foster ally engagement to improve the well-being of marginalized students. This project tested a theoretically informed educational initiative that could be beneficial to other campuses.

78. Policy Priorities on Indigenous American Reservations

Presenter(s): Diya Patel

Advisor(s): Dr. Andrea Wolfs

Census Bureau data shows poverty rates for Indigenous Americans and Alaska Natives to be 25% compared to the national average of 11.5% (Shrider & Creamer, 2023). Voting eligible Indigenous Americans in poverty often have to choose between decisions that enable them to vote and those targeting more pressing needs. Poverty-induced scarcity can dramatically drain one's cognitive resources, affecting decision making (Mullainathan & Shafir, 2013). For Indigenous Americans on reservations who face poverty at grossly disproportionate rates, decision making is more immediately impacted by scarcity. In an investigation on American political priorities in 2024, Pew Research Center finds racial and ethnic differences in priorities for White, Black, Hispanic, and Asian populations. There is extensive research on how poverty impacts Indigenous Americans, but a gap in literature regarding issues they care about. This research sets out to investigate whether the absence or presence of resources on reservations, specifically, impact political priorities for Indigenous American populations that live on reservations. Participants are self-identifying Indigenous Americans currently living on reservations. Due to prevalence of food insecurity on reservations, we anticipate that Indigenous Americans on reservations will prioritize issues other than strengthening the economy, which was the top voter priority of 2024 (Pew Research Center, 2024). We hypothesize that participants will prioritize protecting the environment and reducing climate change. Given the prevalence of drug use on reservations, we hypothesize that participants will prioritize reducing the availability of illegal drugs (Beauvais, 1992; Dennis & Momper, 2012). Our final hypothesis is that participants who self-categorize as living in rural areas will prioritize improving transportation and infrastructure. This study informs representatives who serve reservation areas about the community-specific needs so that they can push for legislation and funding initiatives that target Indigenous American's top priorities.

79. Stress was a Strong Predictor of Disordered Eating Symptoms among Asian and White Women

Presenter(s): Angelina-Rose Thalheimer

Advisor(s): Dr. David Frederick

Stress is a significant predictor of eating disorder symptoms because exercising control over food consumption is one maladaptive coping mechanism used to buffer against negative feelings of stress. Minority Stress Theory highlights the additional stressors faced by minorities that could exacerbate disordered eating, such as experiencing racism and internalizing racist notions about one's racial group. We surveyed 607 adult women (215 Asian; 395 White) via Cloudresearch online panels. They completed measures of stress (PSS-4), body satisfaction (Appearance Evaluation), internalized racism, body mass (BMI), and disordered eating (EDEQ-12). Multiple regression analyses showed that disordered eating was higher among women with greater stress, BMI, and internalized racism and lower among women with greater appearance satisfaction ($B_s = .15-.35$). There were no differences in disordered eating between White and Asian women

($B=.04$). However, stress was a stronger predictor of disordered eating among Asian women, and BMI was a stronger predictor among White women, highlighting the importance of examining unique factors associated with disordered eating among racial minorities.

80. A Multigenerational Glimpse into Causes and Patterns of Mental Health Stigma Within Latinx Communities

Presenter(s): Alicia Ulloa

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

Mental health advocacy is a topic that has begun to gain more awareness throughout different communities. The increasing acceptance and discussion of mental health struggles and improvements in gaining access to resources is a topic that is continuously being integrated into people's culture, education, and ways of life. However, despite the growing awareness, there are still discrepancies regarding the acceptance of mental health awareness in different communities, especially among people of color. Specifically, Latinx communities experience low mental health literacy and high public stigma, which prevents many individuals from seeking, engaging, and remaining in mental health care (Cabassa, 2016). As one of the most well-documented barriers to the treatment of depression, mental health stigma becomes a layered issue that prevents members of the Latinx community from seeking out the help they need (Washburn et al., 2022). This study observes causes and patterns that contribute to the continued stigma surrounding mental health issues within various generations of the Latinx community. Factors such as stigma and self-stigma, general self-efficacy, and mental health literacy are specifically observed. If all the hypotheses within this study are supported, this will help to establish a baseline for new tools to assess mental health issues amongst the Latinx community. There would be a clear foundation upon which practitioners could evaluate, understand, and treat mental health issues through a more culturally competent lens. Newly developed resources can serve as educational tools, aid in clinical practices, and provide measures to help individuals within the Latinx community improve their understanding of what external and internal factors influence their perceptions of mental health.

81. Attachment Styles and Dating Apps in College Students

Presenter(s): Alisa Diaconu

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

Dating apps are a common modern-day tool for finding and building relationships. Research shows that 53% of adults ages 18 to 29 have reported using a dating app, highlighting their prominent role in shaping the social and romantic lives of college-age individuals who make up a substantial portion of this demographic (Pew Research Center, 2023). This research is predicated on the Theory of Attachment that states that attachment styles are formed based on the nature of one's interactions with their primary caregivers as infants and that this impacts how people form relationships in later life (Bowlby, 1969; Bowlby, 1989). The goal of this study is to refine our current understanding of college age dating app tendencies in the context of attachment styles

as defined by the theory of attachment. Given the prevalence of dating apps, understanding how attachment styles affect behaviors such as ghosting, emotional intimacy motives, preference for non-committal interactions, and profile accuracy is increasingly relevant. If the hypotheses in this study are supported, these insights could guide the design of dating platforms to foster more meaningful connections and reduce patterns of avoidance, miscommunication, and distress. On a societal level, this research contributes to the evolving discourse on modern relationships, shedding light on how technology intersects with human attachment dynamics in ways that shape emotional well-being and relationship satisfaction.

82. The Correlation Between Religious Engagement and Substance Use Behaviors

Presenter(s): Anicka-Judith Torres

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

With growing interest in how religion influences behavior and the alarming rise in fentanyl-related deaths in the United States, it is important to understand the role religious engagement plays in substance use. While past research has explored religion's impact on behavior (e.g., Hummer et al., 1999; Koenig, 2001), there is still much to learn about how different levels of religious engagement influence substance use, especially throughout recovery. This study applied Social Control Theory, which suggests that strong social bonds and community involvement could help deter risky behaviors like substance use. Using data from individuals in a detox facility, this research examined whether higher levels of religious engagement correlated with lower substance use severity, taking into account factors such as age, gender, and trauma history. This study's findings could help improve prevention and intervention strategies by promoting faith-based support systems that could serve as protective factors. This research has the potential to inform rehabilitation programs, policymakers, and community organizations on how to better integrate social and emotional support into addiction recovery efforts. By understanding the role of religious engagement in recovery, this study may help create more effective, community-driven solutions for individuals struggling with substance use and assist in developing long-term support strategies that promote lasting recovery.

83. Risking the Burn: Motivations and Risk Perception around Sunscreen Use

Presenter(s): Ari Raphael

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

Individuals living in year-round sunshine, such as Southern California, risk ultraviolet (UV) radiation on a daily basis. Regardless, many do not engage in sun-protective behaviors (SPBs) that protect against UV exposure, such as wearing sunscreen and protective clothing. One consequence of unprotected exposure is skin cancer, the most common cancer in the US and worldwide, causing more than two deaths in the US every hour (The Skin Cancer Foundation, 2024). Sunscreen use can be analyzed using risk perception, or an individual's judgment of their risk of danger influenced by personal experience, emotions, or environment. Previous research has investigated the barriers to SPBs using risk perception, but there are many factors which

influence a person's engagement. This study will compare individual self-reports of sunscreen use with three factors: family history of skin cancer, knowledge about skin cancer, and identity as an athlete, to discover any possible links between sunscreen use and risk. If found to be significant, these associations can be used to guide skin and public health programs. These results could continue highlighting the importance of sunscreen use practices and encouraging positive lifestyle and health changes by practicing daily sunscreen use. Additionally, learning the influence of risk perception on sunscreen habits could guide interventions targeted to populations of increased risk, like athletes or those with a family history of skin cancer. Ultimately, these findings aim to inspire workplaces, schools, athletic departments, and other communities to educate and encourage the use of sunscreen.

84. The Impact of Natural Environments on Cognitive Functioning & Problem Solving

Presenter(s): Cecilia Rivkin Brennan

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

Outdoor recreation in the US has dropped sharply in the last decade as Americans begin to spend less time outside. Increased urbanization and the prevalence of technology has kept current generations inside and separate from the natural world. (Fox, 2020). But what is this doing to us? Some scientists argue that humans have an innate need to connect with nature, a term known as Biophilia, which “descend from ancient Greek: “life” (bio) and “love” (philia); it literally means love of life.” (Barbiero & Berto, 2020). It is essential to be aware of the benefits of a natural environment and how lack of exposure may affect the human brain the future. In the field of environmental psychology, there are two prominent guiding theories (Bratman et. al., 2012). Attention Restoration Theory (ART) was formulated by Kaplan and Kaplan (1989) and Stress Reduction Theory (SRT) was formulated by Ulrich (1979). Assuming the hypothesis of this paper are supported, the implications for the real world are infinite. Increasing time spent outdoors could become a norm that is incorporated into schools and workplaces. Overall, this will show that everyone regardless of current lifestyle should spend more time outside and exposed to natural environments.

85. Single-Sex Education During Formative Years: Investigating the Influence on Social Development

Presenter(s): Emma Walker

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

Proper social development is crucial because of how it enhances the overall well-being of individuals, which is why studying how educational environments impact this area of growth is highly important. Within this study, I will focus on how both the environment of single-sex education and coeducation affects several aspects of one’s social development, such as self-esteem, peer and romantic relationships, social norms, and life satisfaction. Furthering this, in the article “Single-sex Education: What Does Research Tell Us?” by Emer Smyth, he promotes that overall, male and female students in coeducational settings feel more positive about their schools

and about the development of their schooling, finding that both boys and girls consider coeducation as more of a “natural environment and feeling” (Smyth, 2010). Participants will engage in a questionnaire inquiring about what type of education they received during adolescence (ages 13-19), followed by a series of four questionnaires assessing the four variables of social development. Results are expected to find a difference in social development, in that individuals who attended coeducational schools will have a greater social advantage, seen demonstrated in higher results within the surveys, compared to those who went to single-sex institutions.

86. Distance Between Hometown and College and Who Students Turn To for Support

Presenter(s): Francesca Thompson

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

Social support is extremely important for all individuals during times of distress. For young adults entering a college or university setting for the first time, this support usually comes from friends, family, and other social relationships. These relationships are prevalent and impactful in the lives of young college students (Hefner & Eisenberg, 2009). The Buffering Hypothesis states that the presence of social support protects against negative health effects and buffers against emotional distress, suggesting that social support is necessary for all individuals (Cohen & Wills, 1985). The purpose of this study is to highlight the implications that come with going to college and how this life change affects social support preferences. If the hypotheses in this study are assumed correct, students will have a better understanding of what to expect when they go to university. That way, they can better prepare themselves for this transitional phase. Additionally, the study may highlight the growing importance of digital communication by reflecting an increase in certain modes of communication and digital support systems. The study also aims to give universities a better understanding of what resources they should implement in order to better help students. Understanding the relationship between distance between hometown and college and social support preferences can provide valuable insight into how to improve students' overall college experiences.

87. The Impact of Self-Objectification on Existential and Social Wellbeing in Young Women

Presenter(s): Gabriella Lim

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

This study examined the relationship between young women's self-objectification beliefs and behaviors and various aspects of existential and social wellbeing. The foundation of this study, objectification theory, proposes that women often internalize an observer's perspective of their bodies, leading to self-objectification and negative impacts on mental wellbeing. Well-researched findings of this include body image concerns and eating disorders, and this study extended research to other facets of mental wellbeing. Female undergraduate students at Chapman University completed standardized measures assessing their self-objectification beliefs, physical appearance comparisons, authenticity, meaning in life, and aging anxiety. If the hypotheses are

supported, it is suggested that appearance-based cultural pressures may contribute to poorer outcomes of existential and social wellbeing among young women. A stronger knowledge of these relationships may support interventions that promote healthier self-concepts for young women navigating beauty standards, and encourage them to lead meaningful lives that transcend appearance concerns. Overall, this study contributed to a better understanding of the relationship between self-objectification and aspects of existential and social wellbeing in young women.

88. The Impact of Severe Migraine on General Mood and General Well-Being

Presenter(s): Madeline Gorey

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

The project I'm proposing for the Student Symposium takes a closer look at the relationship between experiencing migraine symptoms and the ways in which general health and well-being are impacted as a result in these individuals specifically. The study examines how symptoms of anxiety, depression, overall quality of life, and self-efficacy may be observably different within the migraine patient pool in comparison to individuals that do not struggle with migraine. Current research suggests that there's likely a positive correlation between the severity of migraine symptoms and the severity of depression and anxiety symptoms, as well as a likely inverse correlation with levels of self-efficacy. Additionally, general quality of life will be observed specifically in relation to the gender of the patient, expecting that female migraineurs will have lower life quality than male migraineurs considering the heavily influential role that hormones play in the underlying mechanisms of migraine.

The survey I've composed will utilize the Migraine Disability Assessment Questionnaire to assess the migraine severity experienced by the patient, the Hospital Anxiety and Depression Scale to measure anxiety and depression symptom severity in the patient, the Migraine-Specific Quality of Life Questionnaire to measure quality of life, and the General Self-Efficacy Scale to assess the level of self-efficacy experienced by the patient. I expect the results to demonstrate heightened severity of anxiety and depression symptoms with greater migraine severity, lower levels of self-efficacy in individuals who experience greater migraine severity, and that females who experience migraine will have a lesser overall quality of life than males who experience migraine. Considering that only individuals who experience migraine will be included in the study results, it is also likely that my sample size may end up being too small to justify generalizing the results to the entire population of individuals who struggle with migraine.

89. The Effects of Growing Up In An Environment Where Alcoholism Is Present

Presenter(s): Mary Kearin

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

Trust plays a crucial part in any healthy romantic or platonic relationship. Growing up with an alcoholic caregiver can have an immense impact on this aspect of an individual's relationships due to the inconsistency in behavior and treatment of the parent to child, the developed fears of abandonment, lack of boundaries, and hyper vigilance. Understanding how these factors impact

the development of trust dynamics is essential for both those who are directly affected by the behavior of an alcoholic parent, as well as their future partners and mental health professionals providing them with support. Given the prominence of alcoholism, with research showing that one in ten children live with a parent battling an alcohol disorder (T, B., 2024), it is important to recognize the impact this experience can have on the adult child when it comes to trust and overall well-being. The purpose of this study is to measure the ways in which growing up in an environment with an alcoholic caregiver present impacts the quality of that child's relationships as they enter adulthood. To conclude the quality of relationships, we measured each individual's levels of trust, resilience, trauma response and attachment style through four different questionnaires. With this, we analyzed the data and compared the results of those who grew up in an environment with an alcoholic caregiver present vs those raised with no addiction present. In conclusion, we expect participants who grew up with an alcohol parent to measure higher on the resiliency scale, have more difficulty, as well as less trust in adult relationships than those who did not grow up with an alcoholic caregiver. Additionally, we expect participants who grew up with an alcoholic parent to be less likely to report a secure attachment style when compared to the other attachment styles.

90. Dual Perspectives: Exploring Self-Identity Development in Twins

Presenter(s): Sophia Lucas

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

While the field of psychology is no stranger to the use of twins in studies, there is a notable scarcity of research that focuses on the lived experiences of twins themselves. Twins are frequently studied to compare genetic and environmental influences on development, but the experiential aspect of being a twin has yet to be examined as thoroughly (Bacon, 2006; Kozlac, 1978; Mark et al., 2017; Pulkkinen et al., 2003). This study aimed to address this gap by investigating the developmental implications of being a twin, particularly in regards to the formation of self-identity and individuality. As a guide, it built off of the “looking-glass effect,” a social psychology theory that states that an individual’s self-concept is strongly influenced by their perception of how others perceive or expect them to be (Cooley, 1902). Participants in this study were asked to complete a survey that explored topics such as their self-concept, attachment style, and perceived level of experienced social comparison with their sibling. It was expected that twins would experience more difficulty in establishing a sense of identity and a secure attachment style compared to non-twins, with a higher effect for monozygotic twins compared to dizygotic twins. If the results align with these expectations, these findings could inform parenting strategies, educational approaches, and even clinical interventions aimed at fostering individuality and secure attachment styles for twins. Additionally, deepening one’s knowledge of how the twin dynamic influences self-concept is valuable in understanding not only twins themselves, but also how relational dynamics in general and the looking-glass self effect can shape identity development as a whole.

91. ACES, GPA, Academic Achievement

Presenter(s): Yasmin Kamara

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

Adverse Childhood Experiences refer to traumatic events which occur during childhood that can have lifelong effects on an individual's physical, mental, and academic development. This study further investigates the relationship between ACEs and academic achievement, specifically focusing on GPA and other academic outcomes, such as time spent in college or university. In this study, the ACEs questionnaire was utilized in order to measure childhood trauma and examine its correlation with academic performance, assuming that individuals with higher ACEs scores will demonstrate lower GPAs and perform less efficiently overall, academically. Furthermore, this study also emphasized the age at which ACEs occurred, hypothesizing that earlier exposure to trauma will result in a higher degree of academic challenges. Incorporating findings from Elder's Life Course Perspective Theory, it highlighted the lasting influence of early adversity on various life outcomes, including academic performance and achievement. Additionally, findings from previous studies imply that ACEs may lead to cognitive impairments, mental dysfunctions, and other physical health disparities, which all contribute to academic struggles and delayed progress in education. The goal of this study is to provide further evidence of the detrimental effects that ACEs have on an individual's academic performance and advocates for early intervention and prevention to minimize the impacts of childhood trauma. This promotes a healthier environment for children to develop and overcome the barriers which come with those traumas. The results from this study and research may contribute to a deeper understanding of the relationship between ACEs and academic success, which calls attention to the need for targeted support systems for affected individuals.

92. Neighborhood Cohesion and Psychosocial Well-Being: Differences by Race/Ethnicity

Presenter(s): Maverick Morales

Advisor(s): Dr. Jeniffer Robinette

Perceived neighborhood cohesion is related to numerous mental health benefits, yet some research suggests racial/ethnic disparities in access to neighborhood cohesion. Much of the existing research investigates only one outcome, limiting the ability to synthesize across findings. The strength of the current study is that it utilized an outcome-wide approach to investigate racial/ethnic differences in associations between perceived neighborhood cohesion and four psychosocial outcomes. Using data from the Health and Retirement Study, we tested the hypotheses that (1) higher perceived neighborhood cohesion would relate to higher life satisfaction and lower anxiety, loneliness, and perceived stress, and that (2) non-Hispanic White participants (n = 5,095) would benefit more from neighborhood cohesion compared to non-Hispanic Black (n = 1,431) and Hispanic participants (n = 1,070). Results from this study confirmed both hypotheses: higher perceived neighborhood cohesion was associated with significantly higher well-being on all 4 outcomes adjusting for race/ethnicity, age, gender, and education level. Furthermore, neighborhood cohesion was more strongly associated with life satisfaction,

loneliness, and perceived stress among non-Hispanic White participants than minority groups. These findings suggest that interventions should provide minorities greater access to neighborhood cohesion.

93. Gender Differences in the Association Between Marital Status and Epigenetic Age.

Presenter(s): Theo Moran, Alina Kushner

Advisor(s): Dr. Jeniffer Robinette

A large body of research documents gender differences in associations between marital status and health. A majority of studies reveal greater physical and mental health benefits from marriage among men, with a smaller set of studies showing no gender differences. The present study extrapolated research on these gender differences to epigenetic aging assessed on 3 clocks (DunedinPACE, GrimAge, PhenoAge). Accelerated epigenetic aging is a risk factor for morbidity and mortality and investigation of these outcomes allows for the early detection of individuals at risk for poor health. Although previous research has indicated that married individuals exhibit decelerated aging, no research to our knowledge, has investigated gender differences in the relationship between marital status and epigenetic age. Using data from the Midlife in the United States Study (men N = 469, women N = 534), the present study tested the hypotheses that 1) being married would associate with decelerated epigenetic aging and that 2) this association would be stronger among men. Results suggested that being married, relative to never marrying or being separated, divorced, or widowed, was associated with decelerated epigenetic age on the GrimAge and DunedinPACE clocks, and that these associations were stronger for men than women. On the PhenoAge clock, however, being married was only associated with decelerated aging among men. Among women, being married was associated with accelerated PhenoAge. These gender differences inform the development of interventions targeting marital factors that may accelerate epigenetic aging among women.

94. More Than Just Coworkers: A Study on Employee Social Connections and Mental Health

Presenter(s): Chloe den Hartog, Paige Austin

Advisor(s): Dr. Julia Boehm

As we age, building social connections becomes more difficult due to work demands and other responsibilities. Along with that, depression is more common among adults aged 18 to 39 years compared with adults aged 40 years and older. While research into social connections and health is a widely studied topic, research that examines young adults' social connections in the workplace with depression is rare. This study hypothesizes that high levels of satisfaction with social connections in the workplace will correlate to lower levels of depression for young adults. The data analyzed comes from a longitudinal cohort study of participants born in the U.K. in 1958. The age 23 assessment comprised 12,537 participants, of whom 8,309 (55% men, 45% women) completed measures of one's satisfaction with coworkers and depressive symptomatology. A correlation coefficient was used with responses to one questionnaire item (Q19: "How satisfied or dissatisfied do you feel with the people who work with you in your present job") and depressive

symptoms (24 items from the Malaise Inventory). Linear regression models were used to examine covariates. Results indicate a significant negative correlation between satisfaction with co-workers and depressive symptomatology ($r = -.11$, $p < .001$), where the less satisfaction one has with coworkers, the higher their depressive symptomatology is. Regression analysis controlling for sex, marital status, typical pay, and hours worked showed similar results ($B = -.43$, $SE = .037$, $\beta = -.12$, and $p < .001$). These results reveal the importance of social connections in the workplace for mental health. This study's sample size provides extensive data on these variables; however, the cross-sectional data cannot determine the direction of the effects. These results suggest that social connections in the workplace are significant to mental health. Companies should encourage young adult employees to build connections with their peers.

95. Supporting the Supporters: Well-Being in Caregivers of Partners with Disabilities

Presenter(s): Darby Lyons

Advisor(s): Dr. Julia Boehm

More than 50 million adults in the United States are caregivers to family members with disabilities. Caregivers of family members with disabilities face unique challenges including financial stress and intensive, specialized responsibilities. Research suggests that caregivers experience increased depression, anxiety, and stress compared with non-caregivers. Furthermore, the support systems available are not always accessible, effective, or easy to navigate. The present research aims to examine partner caregivers and their well-being, which tends to be under-researched. It will center on an analysis of optimism, satisfaction with life, and agency for those with and without disabled spouses. The analysis will utilize data from 50-year-old participants in the 1958 National Child Development Study, which has repeatedly assessed a variety of variables in approximately 17,000 people from their births in 1958 through present-day. Well-being was qualitatively assessed from short, open-ended responses from participants. Ten undergraduate research assistants read and rated more than 7,000 responses for the extent to which each showed optimism, satisfaction with life, and agency (1-7 scale). Research assistants underwent extensive training to ensure common evaluation processes, and each response was analyzed by two research assistants independently, with scores averaged together. Linear regression will be used to examine the relationship between caregiving for a disabled partner and levels of optimism, satisfaction, and agency. Furthermore, differences between male and female participants will be examined. I hypothesize that non-caregiving will predict higher levels of the three well-being variables than caregiving. The goals of this research are to provide a more complete understanding of the overall well-being of caregivers for partners with disabilities, explore the complex interactions between their well-being and support systems available, and advocate for improved support systems based on under-researched caregiving needs.

96. Visual Behavior Dataset - Motivation and Change Detection

Presenter(s): Eusabeia Silfanus

Advisor(s): Dr. Oliver Lopez

Motivation to receive rewards can influence task performance, measured by accuracy and signal-noise discrimination in a detection task. In the Visual Behavior 2P project by the Allen Institute, mice ($n = 66$) received water rewards for detecting visual stimulus change while running on a wheel as their neural activity was recorded through single-plane calcium imaging. Mice performed under two conditions of varying motivation: sated (PV) after water intake or without (AB). Repeated trials, resulting in 2689 data points, were categorized as hit, miss, correct rejection, or false alarm. The data, an open science resource under the Allen Brain Map Circuits and Behavior, was analyzed. As an introduction to using open data, this project utilizes negative binomial and multivariate nonlinear regression, both using the log-link function, to fit the data. When the change is present, mice in the AB condition performed better, with more hits and fewer misses ($\hat{\beta}^2 = 3.58$, $\Pr(>|z|) < .001$; $\hat{\beta}^2 = -2.33$, $\Pr(>|z|) < .001$, respectively). However when the change isn't present, or a sham change, mice in the PV condition performed better, with more correct rejections and less for false alarms ($\hat{\beta}^2 = .562$, $\Pr(>|z|) < .001$; $\hat{\beta}^2 = -3.46$, $\Pr(>|z|) < .001$, respectively). Accuracy scores were calculated, and those in the AB condition ($M = .154$, $SD = 0.08$) were significantly higher than those in the PV condition ($M = .126$; $SD = 0.01$; $t(1479.5) = 13.38$, $p < .001$). These results indicate that incentivising tasks can, to an extent, improve performance in a discrimination/detection task. With a more improved understanding of how to use open science tools, future analysis can create models of better fit and utilize neural activity data, which was also recorded, to better understand both behavior and brain activity.

Software Engineering

97. Designing Social Media Platforms for Collective Action

Presenter(s): Paige Caskey, Radhika Puri, Angelina Dieu, Daisy Fernandez-Reyes, Hannah Bauer, Jalen Myers

Advisor(s): Dr. LouAnne Boyd

In the digital age, social media has become a powerful tool for mobilizing social movements and raising awareness of social justice issues. This research lies at the intersection of computer supported cooperative work, platform design, and digital activism. It explores how a platform influences the ways users engage in activism, and asks: How can the design of social media platforms be reimagined to foster more effective, inclusive, and positive experiences for social activism and collective action?

Prior studies have analyzed the role of social media in facilitating activism, such as the types of media people choose to use, and ways that they use it. However, less attention has been paid to the design mechanisms that enable or hinder such activism. Research on interface usability, algorithmic amplification, and moderation policies has shown that current designs often prioritize

engagement metrics over collective well-being and meaningful discourse, which can result in performative activism, harassment, or burnout among organizers and participants.

This study addresses a growing need to assess and reimagine social media systems through the lens of their impact on activism. This approach, combining case studies and interface analysis, identifies both structural barriers and promising design interventions. Findings in previous research highlight the importance of community-building tools, visibility mechanisms, and features that support sustained engagement over time.

The significance of this research lies in its contribution to a new field of design that is centered around activism. By shifting the focus to highlight activism rather than engagement, this work offers new frameworks for understanding how collective intelligence and behaviors can be more effectively supported in digital spaces. Ultimately, it provides practical recommendations for developers, policymakers, and designers aiming to build more inclusive online infrastructures.

World Languages and Cultures

98. The Representation of the “Other” in Francophone Short Fiction

Presenter(s): Calissa McNutt

Advisor(s): Dr. John Boitano

This study aims to expand knowledge on short fiction available from the broader Francophone community and to consider the variability of both authors who are part of the “other” and those who are writing about the “other” in French. It is, in other words, a brief introduction into the world of Francophone short fiction to bring awareness to short stories beyond the U.S. and to speak on the issues of literary accessibility for foreign language stories, the richness beyond the literary canon abroad, especially for this shorter form of writing. In literature, the “other” is defined as groups of people that are outliers of the dominant white male space, including anyone of color and those identifying as female. It was necessary to expand the study from French short fiction to anyone from a Francophone nation who writes in French to encompass such a broad group. There is overlap in literary themes, genres, and critical theories explored within and across each section. No two stories are exactly alike, and the author’s culture and history influence this variation. Therefore, this study will provide background and contextualize the short story in France and some key moments for Francophone writers in terms of this shorter form of literature. The three major sections of this examination and literary analysis are historical background, including fairy tales, contemporary Francophone short literary fiction from the 1990s through the 2000s, and more genre-focused contemporary short stories.

99. The Evolution of the Concept of Love in French Language and Literature.

Presenter(s): Mackenzie Edwards

Advisor(s): Dr. John Boitano

From the Middle Ages to present day, the theme of love has fascinated French poets, novelists and musicians. The concept of love has evolved through different periods of French literature, and the language reflects changes in the social understanding of love throughout history. Simply by examining the words, phrases and writing of each era, we can understand how the concept of love began to evolve. Our study will show that the concept of love has a long history, particularly in France. It will show that society and culture have revolved around love and the impact this emotion has had on the world, and why it's so important to study it. On one hand, we will analyze literature such as Charles Baudelaire's "Fleurs du Mal" and others to understand the notion of love and the choice of words in his poetry. On the other hand, we'll analyze in greater depth how literature and philosophy have idealized and complicated the concept of love in France, to reveal how distinctions in language shape French attitudes to relationships and emotions. Finally, we analyze the influence of social movements and political change to see how the French Revolution, the rise of feminism and the existentialist movement have shaped the understanding and representation of love in French language and literature. By analyzing how social movements challenged power dynamics such as gender roles, we will offer a different perspective on gender equality, sexual freedom and "love".

100. Paris' Role in Forecasting Global Trends: An Exploration of Fashion Week

Presenter(s): Rachel Schofield

Advisor(s): Dr. John Boitano

French fashion designers and Paris Fashion Week have emerged as a cultural phenomenon that inadvertently serves as a powerful trendsetting mechanism, shaping global fashion and influencing industry standards. As a result, Paris has solidified itself as the world's fashion and haute couture capital for centuries. This study will dissect Fashion Week in the context of French culture, its rich history, and French fashion's relevance on a global scale. The approach to this research is a qualitative analysis of historical and modern case studies, fashion journalism, and digital media on the industry and French culture. The study begins by examining the history of the French luxury market and early examples of French spectacles dating back to the 17th century, giving context to French couture and the origin of runway shows. Additionally, we will analyze how the Industrial Revolution and World War II contributed to the first Fashion Week in New York City and the event's transition to global expansion. Finally, we will assess how Paris Fashion Week became such a celebrated event, cementing Paris as a globally renowned fashion capital with a dominant influence on global trends. Through this, we can evaluate the future of trend forecasting and the luxury market with the growing concern for ethics and sustainability within the fashion industry and the digitalization of fashion media.

AF209A

Moderator: Dr. Desiree Crevecoeur-MacPhail

Psychology

Rewriting the Narrative: The Relationship Between Trauma, Leadership Identity, and Workplace Satisfaction

Presenter(s): Bridget Hahn

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

Trauma is widely recognized for its devastating psychological effects, yet emerging research suggests that it can also fuel significant personal and professional growth. The bulk of previous trauma-focused research focuses on an individual's psychological recovery, where it falls short in fully analyzing the positive impacts that trauma can have on an individual's unrecognized abilities. Most studies examining trauma in a professional context primarily focus on workplace-induced trauma, rather than exploring how personal trauma outside of work or other leadership roles influences an individual's behavior and abilities within those professional settings. This study examined the relationship between past traumatic experiences, leadership identity, and workplace satisfaction, using the Social Identity Model of Identity Change (SIMIC) as a theoretical framework. SIMIC asserts that identity transformation occurs through maintaining or acquiring social group memberships, which can facilitate well-being and resilience. Applying this model, this study examined whether individuals who have experienced trauma are more likely to develop a transformational leadership style, demonstrate greater workplace satisfaction, demonstrate increased resilience in their leadership, and develop increased empathy towards their professional relationships. The research method employed a Qualtrics survey distributed to the Chapman University Alumni Association LinkedIn Group and the Panther Network Alumni Discussion Group, leveraging validated psychological scales which measured the degree of exposure to past trauma, leadership style, empathy, well-being in the workplace, and resilience. By investigating the intersection of trauma, leadership identity, and workplace satisfaction, this study attempted to reframe the narrative that trauma is not solely a life-altering impediment, but can create purpose-driven leaders that will harness their experiences to create impactful changes in their communities.

JLO is Latina: Analyzing Criteria of Latinidad Amongst the Latine/x Population

Presenter(s): Mackenzie Rodriguez

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

The purpose of this study is to measure how the criteria of Latinidad amongst Latinx/e people in the U.S. can affect their cultural identity. A continuous conversation between Latinx/es living in Latin America or the U.S. argues over who can identify as Latinx/e. Often, celebrities are the main examples of the criteria Latin Americans dictate to be accurate and true. Many U.S. Latinx/es struggle to understand their cultural identity and often question themselves when discussing the criteria of their Latinidad: what makes them Latinx/e? The social identity theory (Tajfel, 1981) will

help analyze the connection between self-defined identities and socially structured identities within the Latinx/e community. Through the use of a qualtrics survey by identifying Latinx/es immigrants and generational experiences in these demographics, the measures of Latinidad will be identified on a self-created measure. By asking various individuals such as immigrants, children of immigrants, and so forth, it will create diverse results in defining what it means to be Latinx/e. Assuming these hypotheses are supported, the possible criteria for Latinidad could be used to exclude certain aforementioned communities. By continuing to try and disregard U.S. Latinx/es, it questions the experiences of millions of people in the U.S. with diverse experiences many have direct cultural roots in Latin American countries.

Does Task Success in People Result in Lowered Levels of Reported Depression?

Presenter(s): Sohum Joshi

Advisor(s): Dr. Desiree Crevecoeur-Macphail

The project's purpose is to make more in-roads into the study of success and failure processing when people are dealing with depression. Going along with this thought, the central research question deals with whether task success specifically decreases the levels of depression for the participant. Two main significant research focuses guide this study. Firstly, Csikszentmihalyi's flow theory and research surrounding it contribute greatly. One proposed hypothesis within the study states how the initiation of a Flow state can decrease levels of participants' depression. Research into flow describes it as a state of enjoyment, so the potential presence of flow can present an interesting aspect. The other significant focus is research into those with depression and task failure. A specific piece of research that is of interest describes the relationship between those who are depressed and their proclivity to blame themselves for failures. This line of research leads to another hypothesis within my study, stating that the vice versa could be true and those with depression may blame themselves less and indicate lower levels of depression in a success scenario. The expected results are that broadly, success should result in lowered levels of depression.

Music and Cognition: How to Keep the Brain on Beat

Presenter(s): Rylen Sakamoto

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

Music, as the conversion of words and sounds into expressive art, has been often used as a form of catharsis or emotional regulation. While research on common mood outcomes from music exists, further examination is necessary, as this knowledge, once fully understood, can be applied beyond music therapy, and be utilized to enhance our cognitive efficiency. Current research includes Music Mood Theory, which suggests that music has a meaningful impact on our moods, which correlate with behaviors such as maintaining tempo and harmony (Hu, 2010). The purpose of this study is to establish a deeper perspective on the impact music has on one's psychology and learn the extent of its effects on one's cognitive abilities. Data was gathered through a Qualtrics survey, through which participants were instructed to listen to songs intended to prime their moods, before having them complete exams for memory and cognitive speed. Assuming the

data confirms my hypotheses, music can act as a mental reinforcer that would aid all forms of intellectual advancement, from academic study to professional workflow. It would also provide the field of psychology with further insight into the design of music therapy, as specific traits of a song, such as the degree of mood congruency or mental arousal, would be identified as ideal for patients struggling to process and overcome cognitive quandaries.

AF209B

Moderator: Dr. Hagop Atamian

Biochemistry and Molecular Biology

Identifying Interactions between Nitrogenase and Protective Proteins under Carbon Monoxide Stress

Presenter(s): Katie Sanders

Advisor(s): Dr. Cedric Owens

Nitrogenase is a bacterial enzyme that converts nitrogen gas into ammonia, an important plant nutrient. Nitrogenase is a protein complex consisting of a homodimeric reductase (Fe-protein) and a catalytic subunit (MoFeP). The biological gas and pollutant carbon monoxide (CO) inhibits nitrogenase. To protect nitrogenase from CO, many nitrogen fixing organisms express a small protein, CowN, which interacts with MoFeP to weaken carbon monoxide inhibition. The goal of this research was twofold. First, we aimed to identify if other proteins bind to MoFeP under CO-stress conditions. Second, we wished to determine if CowN interacts with other proteins besides MoFeP. To do so, cross-linking and pulldown approaches were utilized. A series of cross-linker, including EDC, BS3 and SIAB, were tested to capture protein-protein interactions in cell lysate. When cross-linking with BS3 and SIAB, the interaction between MoFeP and CowN was found, confirming that the experimental approach detects known binding partners. Post-pulldown analysis by SDS-PAGE gels revealed several bands that may correspond to novel crosslinked complexes. Further analysis of the potential cross-linking bands by mass spectrometry to identify the proteins within these bands, however, were inconclusive. Experiments using different cross-linkers are underway to determine the CowN and MoFeP interactions with other proteins under CO stress.

PRMT7 Negatively Regulates the Expression of p53 in Response to DNA Damage

Presenter(s): Molly Niswender, Evan Hughes

Advisor(s): Dr. Cecilia Lopez, Dr. Marco Bisoffi

Protein Arginine Methyltransferase 7 (PRMT7) is the only member of the protein arginine methyltransferase protein family that monomethylates its protein substrates. PRMT7 is found in both the nucleus and cytoplasm of breast cells and is believed to play a robust role in the tumorigenesis and metastasis of breast cancer. The goal of this project is to uncover possible pathways for PRMT7 to promote cancer progression. A preliminary antibody array was performed

to determine the regulation of known cancer-related proteins by PRMT7. An early-stage human breast cancer cell line, MCF-7, was transfected with plasmid pCDH1-hPRMT7-GFP to over-express PRMT7. Qualitative and quantitative analysis of detectable expression changes compared to sham transfection revealed a decrease in p53 expression, a protein not previously associated with PRMT7. Upon DNA damage, p53 can induce the expression of genes like p21, which inhibit cyclin-dependent kinases (CDKs) and halt the cell cycle. This pause allows the cell time to repair the DNA damage before proceeding with division. Our current research aims at identifying the mechanisms of action by which PRMT7 regulates p53. For example, PRMT7 may monomethylate proteins directly implicated in the expression or activity of p53. Successful completion of this project will provide novel insights into how PRMT7 contributes to breast cancer progression.

Investigating the Molecular Mechanisms of Drug Resistance in Prostate Cancer Cells

Presenter(s): Navya Sharma, Gian Lagemann, Gabrielle Carbonel, Arthur Manda

Advisor(s): Dr. Hagop Atamian, Dr. Hamid Montazeri, Dr. Marco Bisoffi

Cancer cells that are resistant to currently used chemotherapy drugs present a significant challenge in the medical field. Some cancer cells are inherently resistant to these drugs, while others develop resistance after prolonged exposure. In the laboratory, resistance was induced in the LnCaP prostate cancer cell line using 2 methods: shock and gradual Enzalutamide treatment. We have sequenced the transcriptomes of these inherently resistant prostate cancer cells and those induced to become resistant in the laboratory. The objective of this project is to analyze the transcriptomes of sensitive and resistant cancer cells to identify the mechanisms underlying the development of the resistance phenotype. A total of 550 million 150 base pair raw sequencing reads were generated, representing 20 samples. From the raw sequences, the adaptors and low-quality bases were trimmed using Trimmomatic version 0.36 with a 100 bp minimum length cutoff. The high-quality sequences were mapped against the latest human transcriptome reference sequences using the Salmon software, and differential gene expression analysis was performed using the generalized linear model (glm) functionality of the edgeR package. Genes with at least a two-fold expression difference between treatments and False Discovery Rate (FDR) ≤ 0.01 were considered differentially expressed genes (DEGs). Our analysis identified between 100 to 1560 DEGs between the different treatments, indicating significant changes in the cancer cells' transcriptome responses compared to the control depending on the type of resistance to Enzalutamide treatment. The findings from this project could contribute to more sustainable drug discovery efforts in the future.

AF209C

Moderator: Dr. Ana Palomar

Art

Clement Hurd and the Artistic Integrity of Illustrated Children's Books

Presenter(s): Cassandra Chan

Advisor(s): Dr. Justin Walsh

"I am very grateful for what you gave me last fall... a sense of confidence in being accepted by you and the class as a valid artist." —Clement Hurd, May 7, 1975 Illustration has long occupied a marginal status within the field of art history, often being seen as commercial and subsequently lesser than "fine art." This dismissal is especially pronounced in the realm of illustrated children's books, where pictures are treated as subordinate to their text in literary discourse and rarely studied as works of art in their own right. While scholars have begun to question these hierarchies, illustrators remain critically underexamined. Among them is Clement Hurd (1908-1988), best known by his illustrations in *Goodnight Moon* (1947). Despite his work raising generations of children and being iconic to American childhood, Hurd's artistic contributions remain largely invisible in academic scholarship. This research argues that Hurd's illustrations should be understood as works of art, not because they resemble fine art or transcend illustration, but because illustration itself can and should be considered a prestigious artistic practice. To support this claim, this project combines close visual analysis of Hurd's work with original archival research, including correspondence, mock-ups, and page proofs. Central to this approach is the development of a set of evaluative criteria —formal visual qualities, aesthetic innovation, artistic intention, and cultural impact—which are used to assess how Hurd's illustrations operate with the same visual and conceptual rigor of recognized artistic practices. Ultimately, this research reveals that Hurd's work exemplifies the compositional, creative, and interpretive choices associated with artistic authorship. Rather than attempting to elevate illustration to fine art by subsuming it into a narrow academic canon, this research reframes book illustration as a distinct and equally valid art form—one that deserves recognition for its artistic merit as well as its enduring cultural impact.

English

Book Banning: The Importance of Taboo Topics in John Green's "Looking for Alaska"

Presenter(s): Victoria Medina

Advisor(s): Dr. Lynda Hall

This project delves into a prevalent and ever-growing issue, the topic of book banning. The banning of books is a notion that has existed for centuries now. However, the growing controversy itself arguably needs to be discussed now more than ever when considering the current state of the world. Honing in on John Green's *Looking for Alaska*, a commonly challenged book, this project seeks to delve into complex issues of both sex and suicide and consider their respective

roles in Green's piece. Essentially, I aim to examine just how necessary these "taboo" topics are for young adult literature. Seeing as Green's novel is typically challenged within educational departments, I argue that Green's employment of heavier topics such as a suggested suicide and rapid, yet explicit, sexual scene are not versed without good reason. Suicide is the number one killer of adolescents in the United States. When considering an adolescent as anyone that spans the ages of twelve-years-old to twenty-four-years-old, it is evident to see that there is a vast and vulnerable group to talk to. Through my research, I aim to focus on suicide statistics and the role of suicide literature in relation to Green's Looking for Alaska. The challenging and possible banning of adolescent literature is not only a threat to the intaking of knowledge but a potential revoking from an adolescent voice that may be waiting to be heard.

Psychology

Music From Your Childhood and Emotional Regulation

Presenter(s): Sarrah Wilkes

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

Prior research has shown that music can evoke numerous psychological and physiological outcomes in individuals (Croom, A. M., 2015). Research has been done on the power of nostalgic music and happiness; however, there is little research on whether listening to music from childhood can increase happiness levels. The purpose of this study is to examine how music, specifically from your childhood, influences emotional regulation and well-being in college-aged students. This is a within-subjects study in which participants are exposed to a song from their childhood, and their levels of happiness, nostalgia, confidence, and coping mechanisms are assessed pre- and post-exposure to this stimulus. The researcher's hypothesis is motivated by Seligman's (2012) PERMA theory (Positive Emotion, Engagement, Relationships, Meaning), which states that music from childhood can influence levels of well-being in an individual. The researcher expects that listening to music from childhood activates positive emotions and engagement with the song, which creates a temporary boost in mood. The findings of this study will enhance our understanding of how music can be a therapeutic tool in emotional regulation in individuals and help to advance our research on how music impacts our experiences. The implications of this study will enhance the need for more music interventions in the school and work setting for individuals across the lifespan and free access to more reliable music streaming services. The study will also demonstrate how mental health tools, such as listening to music from childhood, serve as easily accessible resources for the wider population.

Love, Loss, and Libido: Investigating the Relationship Between Grief and Sexual Drive

Presenter(s): Eleanor Lowy

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

Loss is a universal experience, yet the way individuals navigate grief can differ significantly. Similarly, sexual drive naturally fluctuates over time, but the intersection of these two

experiences, grief and libido, is often overlooked in research due to the sensitive and deeply personal nature of these topics. However, the concept of ‘sexual bereavement,’ which is the grief experienced from the loss of a sexual partner, has started gaining more attention. Current research portrays how many therapists, including seasoned grief specialists, struggle with addressing issues surrounding sexuality and intimate loss in therapeutic settings. There appears to be a gap in training and comfort levels, leaving some therapists uncertain about how to conduct these conversations with patients. Understanding the connection between grief and sexual activity is critical, as it will offer insights that could inform therapeutic methods and training for supporting individuals coping with loss. This study seeks to expand on the theory of sexual bereavement through the relationship between grief and sexual drive, investigating how one impacts the other during periods of loss. Specifically, the study examines how grief intersects with sexual behavior among individuals coping with the loss of a romantic partner (through break-up or death), parents grieving the death of a child, and those mourning the general loss of a significant person in their lives. If the hypotheses are supported, this research could shift society’s understanding of grief, positioning sexual expression as a vital, often overlooked element of healing for many individuals. The results have the potential to challenge cultural taboos surrounding these sensitive topics and redefine therapeutic models to view intimacy as integral to the mourning process.

AF209A

Moderator: Dr. Desiree Crevecoeur-MacPhail

Integrated Educational Studies

“Building As We Go”: Educator’s Constraints to Supporting Central American Unaccompanied Minors in California Schools

Presenter(s): Mackenzie Rodriguez, Braulio Campos Gil

Advisor(s): Dr. Stephany Cuevas

The current study seeks to understand and support the academic and socioemotional needs of Central American unaccompanied minors. It begins to offer a much-needed contribution to the fields of education, immigration studies, and school engagement by identifying how schools support this student population. Using a sociohistorical trauma-reducing framework (Petroni & Stanton, 2021), it explores how educators (e.g., teachers, school counselors, social workers) in California public schools work with these unaccompanied minors. This study focuses on the perspectives of 20 educators who work with Central American unaccompanied minors in California public schools. To develop an understanding of the constraints and challenges educators experience in their work with unaccompanied minors, a flexible coding analytic procedure proposed by Deterding and Waters (2021) was applied. Through in-depth interviews, educators identified different constraints they faced in their work with this student population, including difficulty identifying and tracking students, schools being ill-equipped to support students, and colleagues with limited understanding of the unique circumstances of this student population. These findings suggest that schools are complicit in not addressing the different traumas unaccompanied minors experience or are even perpetuating them, demonstrating the structural limitations of schools to reduce to fully support these students. By identifying some of the constraints these educators face and working to address them, schools can work to become supportive spaces for this student population.

Psychology

A Test of the Minority, SES, and Obesity Stress Model of Binge Eating (MiSESOS-BES) among Black Women

Presenter(s): Angelina-Rose Thalheimer

Advisor(s): Dr. David Frederick

People are more likely to binge eat when they are experiencing acute or chronic stress. Some people use food to soothe these negative feelings of stress, which becomes maladaptive when they lose control over their consumption, developing disordered binge eating patterns. Multiple perspectives have been applied to understand this stress-binge eating relationship, including Hemmingsson's model of obesity causation and the Cyclic Obesity/Weight-Based Stigma (COBWEBS) Model. Furthermore, Minority Stress Theory has been critical for understanding how

racism is associated with mental health among racial minorities. Using constructs from these perspectives, I developed the following model to better understand binge eating behaviors among racial minorities. Key stressors include racial discrimination, consistent with Minority Stress Theory, as well as lower socioeconomic status as identified by Hemmingsson's model. Finally, the COBWEBS model proposes people with higher BMIs experience weight-based stigma, which causes further stress. Black women specifically have the highest prevalence of binge eating disorder (BED), twice that of non-Hispanic White women. Further, prevalence increases for Black women with higher BMIs as 30% report binge eating behaviors, yet less than 8% of Black women seek BED treatment compared to 20% of White women. This model was tested in 250 Black women recruited via Connect powered by Cloudresearch online panels. Consistent with the hypotheses, multiple regression analyses showed that binge eating was higher among Black women with greater reported stress, BMI, and discrimination, and lower socioeconomic status. These findings highlight the importance of understanding the mechanisms of binge eating development and create urgency for targeted interventions that may improve the health and well-being among vulnerable populations.

Fundamental Attribution Error Awareness and Juror Decision-Making Through Video Instructions.

Presenter(s): Lee Melamed

Advisor(s): Dr. Andrea Wolfs

Jurors are tasked with determining an appropriate verdict for defendants based on characteristic and situational information. Though juries are entrusted to be objective in their assessments, the fundamental attribution error (FAE) asserts a universal tendency to overemphasize dispositional qualities while ignoring circumstantial factors in creating causal explanations for others' behavior (Kubota et al., 2014; Neuschatz et al., 2008). Stronger juror emphasis on dispositional factors has been linked to higher rates of guilty verdicts (Devine & Caughlin, 2014; Flick & Schweitzer, 2021), and the FAE and attributions likely affect how jurors weigh mitigating factors—those resulting in more lenient outcomes for defendants (Cassar, 2005; Ross & Shestowsky, 2002). While instructional videos have proven an effective intervention in regulating the FAE in non-legal situations (Clegg et al., 2014; Morewedge et al., 2015), similar effects have yet to be examined in criminal cases. Benefits of simple instructional jury videos have been found (Labat et al., 2023), suggesting they can be a sufficient tool for educating jurors. To address the lack of research explicitly linking the FAE and FAE understanding with verdicts, culpability, and sentencing decisions, the current study investigated A) whether an instructional FAE video decreased jurors' rate of guilty verdicts in a case of aggravated assault, and B) whether culpability ratings and suggested sentencing were affected by such a video. The current study also addressed C) whether the video lowered rates of guilty verdicts, even when no mitigating factors were listed. Mitigators were either explicitly mentioned or not mentioned within the vignette to test the video as a compensatory tool for inadequate defense counsel, a common factor in wrongful convictions as identified by the Innocence Project (Inadequate Defense, 2024). Finally, the current study also

aimed to determine D) whether the FAE video attenuates racial/outgroup biases toward defendants.

Exploring the Link between Attachment, Culture, and Adult Relationships

Presenter(s): Daria Heydari

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

Extensive research regarding childhood attachment and its result in adult relationships has become more prevalent within the past ten years. There are four main attachment styles; Anxious, Avoidant, Disorganized, and Secure (Shaver, 2003). People are understanding more of the impact of childhood attachment in their adult relationship when aiming to strengthen and improve their relationships. The idea of attachment in childhood and the implications it has on adult relationships had not been studied in depth before the 2000s. While there have been discoveries regarding discrepancies in upbringing such as socioeconomic status or parental treatment and their effect on one's attachment style, there has been a lack of research regarding one's cultural upbringing and how that affects the attachment style one develops during childhood into adulthood. Examining how upbringing and cultural context shape a child's values can enhance our understanding of how these factors influence attachment styles in adult relationships. Furthermore, understanding the correlation between each attachment style and cultural differences will help us gain a better understanding of relationships and how we understand compatibility between partners based on experience and upbringing. Furthermore, this may help therapists and counselors tailor their approaches to relationship advice and better cater to certain people with understanding their past. This can improve the effectiveness of therapy methods and foster a deeper understanding of couples and their struggles, ultimately allowing for a more comprehensive approach to treatment and resiliency through it.

AF209B

Moderator: Dr. Ronald Steiner

Biochemistry and Molecular Biology

Collagen Assembly in Crowded Microgel Environments to Construct Tunable ECM Scaffolds

Presenter(s): Abbygail Caine

Advisor(s): Dr. Andrew Lyon, Dr. E. Daniel Cardenas Vasquez

Collagen is the most abundant fibrous protein in the body's extracellular matrix (ECM), traditionally assembled in hydrated environments under moderate crowding conditions that allow for proper cell proliferation. Achieving collagen assembly in highly crowded environments is paradoxical to conventional wisdom in that overpacked environments are not conducive to protein/peptide self-assembly. In this work, we employ poly(N-isopropylacrylamide) ultra-low crosslinked microgel (ULCs) pastes as a tunable, crowded environment within which collagen can

be assembled. The combination of ULC pastes and collagen provides us with a new tool to control ECM mechanics, structure, and bio-integration. Indeed, ULCs are a particularly attractive colloidal building block owing to our synthetic control over their crosslinking, degradability, surface chemistry, and more. Here, we describe the development of composites of varying paste concentrations, visualize collagen assembly, and investigate mechanical properties. By successfully integrating these components, we provide methods to develop dense collagen-based materials with controllable properties.

Computational Science

Multi-Modal Tensor Fusion for Alzheimer's Disease Recognition

Presenter(s): Mason Li, Tiffany Le

Advisor(s): Dr. Yuxin Wen

Accurate and early diagnosis of Alzheimer's disease (AD) is vital for effective intervention and patient care. Traditional diagnostic approaches rely on single modalities such as clinical assessments, neuroimaging, or genetic markers, which may fail to capture the complex, multifaceted nature of AD. Furthermore, existing modality fusion techniques, such as concatenation, fail to capture the joint relationships present between different modalities. To address this challenge, we propose a multimodal tensor fusion network (MTFN) that integrates heterogeneous data sources, including visual imagery, demographics, and time-series data, to enhance AD recognition. Our approach leverages tensor representations constructed using an outer product to model intricate cross-modal interactions while preserving structural dependencies within each modality. MTFN utilizes modality-specific embedding subnetworks to obtain embedding representations of the data, which are fused through an outer product to form a third-order tensor—allowing the model to capture interactions between modalities. Experimental results on publicly available AD datasets demonstrate that the proposed method outperforms the accuracy of the state-of-the-art deep learning classification methods, especially when training data is limited. On a restrictive AD dataset, MTFN outperformed unimodal models by 60% and strongly resisted overfitting compared to existing models. This suggests that the interactions captured by tensor fusion strongly support MTFN's ability to learn meaningful data. This work highlights the potential of tensor-based multimodal learning to advance precision medicine for neurodegenerative diseases. Tensor fusion also promises to improve other branches of precision medicine—such as survival analysis—by effectively modeling the complex, non-linear interactions in data using the outer product.

Electrical Engineering

Thermal-Based Color Detection: An Assistive Technology for Blind or Visually Impaired

Users

Presenter(s): Grace Swartz, Margo Burbank, Vanessa Sullivan

Advisor(s): Dr. Maryam Etehad

Inspired by current assistive technologies, we have designed a system that integrates tactile and thermal-based feedback to assist blind or visually impaired (BVI) users in distinguishing colors. This project utilizes a TCS34725 color sensor and TEC1-12706 Peltier thermal module paired with an Arduino microcontroller. Once the color sensor determines color values, the Peltier module is dynamically controlled by a MOSFET to heat up or cool down based on the values. This simplifies the user experience by allowing the focus to only be on temperature differences, rather than temperature and color values. Though prior studies have suggested the use of a Peltier module for thermal-based feedback, the color-to-temperature mapping aspect remains the least explored - especially when compared to more extensively studied modalities like tactile or other sensory feedback. The current prototype of this design successfully responds to black and white, producing the heating and cooling aspect. However, further research, development, and testing need to be done to expand to a full spectrum of temperature levels that correspond to a wide range of colors. Expected results include obtaining a broader range of color-temperature variations and converting the current device to a wearable device for improved accessibility. If successful, this project could advance a novel form of sensory substitution through thermal feedback, while contributing to more inclusive and accessible design practices that expand how BVI individuals engage with their environment.

AF209C

Moderator: Dr. Ana Palomar

English

The Fisheye Forecast (formerly The Dreamer's Almanac): A Sci-Fi Horror Comedy

Podcast

Presenter(s): Fish Young

Advisor(s): Dr. Jan Osborn

“The Fisheye Forecast” is a sci-fi horror comedy fiction podcast. Combining sci-fi philosophy, rhetorical theory, and experimental music/sound design, the project improves my skills as a satirist and sound designer. The purpose of the project is to give people a laugh, but also help them address the gravity of our reality. The Fisheye Forecast is set in a hyper-corporate future where dreams are bought, edited, and sold to the general public. Host 327, a cyborg, delivers insights into their world by broadcasting the news of the day, each bit a critique on modern culture. The featured episode discusses AI and nuclear energy. Almost everything in 327’s world

is exactly like ours, but as the episode goes on, the more surreal reality develops. My research begins by reading the news. Then, I exaggerate the story's inherent absurdity. This comedy technique turns the fictional into a simulacrum of modern life. Jean Baudrillard's hyperreality, Max Headroom, and The Late Show with Stephen Colbert are key inspirations. I heavily rely on sarcasm as my main form of satirical rhetoric. By posing a world that is slightly worse than our own, I hope to ask my audience "Do you really want a future like this?" CUE's generous offering has radically improved and developed the audio quality of this show. I experimented with sound libraries, audio effects, digital audio workstations, and high-quality microphones. CUE granted me nearly twice my proposed budget, allowing me to produce my own background music for the show with Ableton Live. I also learned to use Logic Pro for glitch effects and non-diegetic tracks. The show airs live on Chapman Radio, Saturdays 4 pm. Thank you!

Film

Real

Presenter(s): Matthew Layton

Advisor(s): Dr. John Benitz

"How much is too much?" The central frame of my creative work tackles this question through the lens of queerness, addiction, isolation, and self-identity, giving an unfiltered voice to today's youth. Social Media's negative effects go deeper than the usual anecdotes of decline in sleep quality, physical activity, and attention span. The ramifications of a negative mental headspace are often overshadowed by flashy promises and a false sense of belonging. The societal impact is especially influenced due to the malleability of the adolescent brain. In 2022, up to 95% of teenagers ages 13 to 17 claimed to use social media, and about a third use it "almost constantly." I am creating a 5-12 minute narrative short film that dramatizes the often-overlooked, harmful undercurrents of social media. To evoke a visceral response, we'll employ avant-garde cinematic techniques, including extreme short lenses, dynamic gimbal shots, dutch-angle dolly movements, and inventive compositions. The sound design will feature heavy emphasis on folly, synthetic scoring and highly edited vocals to underscore the artificial humanism on the piece. Gen Z has an indulgence in escapism media, often featuring glamorized characters. The plot draws viewers into a captivating relationship between the protagonist and the seductive allure of a character that personifies social media. This charismatic presence slowly reveals its darker, addictive qualities, prompting the viewer to confront the question: "What happens when desire gives way to dependency?" As a queer college student in my early 20s, I rarely see films that address the issues my peers and I face with genuine authenticity. By bringing an authentic perspective to these complex themes, this project aims not only to resonate deeply with audiences, but also to spark conversations that challenge the normalization of technology addiction. Sources: <https://www.yalemedicine.org/news/social-media-teen-mental-health-a-parents-guide>
<https://www.zippia.com/film-maker-jobs/demographics/>

Political Science

Tourism Knows No Borders: Analyzing the Political Impact of Border Tourism on International Relations

Presenter(s): Emma Walker

Advisor(s): Dr. Hilmi Ulas

Border conflict zones, both actively and historically, have been points of interest for international relations, as they often lay out an intersection of land rights, religious conflict, or cultural conflict. Tourism as an industry has provided immense economic benefits for nations and has become a driving force for many economies globally. The intersection of tourism and border conflict zones creates a form of destination that thrives off of having visitors interact with active or historical conflicts, known as cross-border tourism. Tourism and its intersection with international relations have been categorized into three main paths: international diplomacy, intergovernmental organization, and citizen diplomacy. However, there is a gap in the research on how border tourism impacts international relations and foreign policy directly, leading to a question of what, if any, policies derive from the act of cross-border tourism to border conflict zones. My research will find how cross-border tourism politically impacts international relations at the levels of international diplomacy and citizens and provide potential tools for improving the border tourism industry.

AF209A

Moderator: Dr. Desiree Crevecoeur-MacPhail

Psychology

Unraveling the Neuroscience Behind Popular Psychedelic Compounds

Presenter(s): Erin Wilbanks

Advisor(s): Dr. Desiree Crevecoeur-MacPhail

The serotonin 5-HT_{2A} receptor is known to be implicated by psychedelic drugs such as LSD, psilocybin, and mescaline, making it the primary target for their novel psychoactive effects. This thesis investigates the relationship between receptor affinity and human potency of these popular psychedelic compounds using a reductionist methodology. More specifically, we expect that rising 5-HT_{2A} receptor affinity is linked to rising human potency, that potency differs across psychedelic classes, and that ergoline-based psychedelics (e.g., LSD) have the highest affinity at both 5-HT_{2A} receptors and highest human potency. Statistical analysis encompasses Pearson correlation to assess the degree to which 5-HT_{2A} receptor potency and human potency are correlated and one-way ANOVA for human potency and receptor affinity comparisons across psychedelic classes. Human potency and receptor affinity is also compared to determine whether potency differences extend beyond the strength of receptor interaction. Findings from this research are a mechanistic contribution to the understanding of psychedelic effects, validating reductionist approaches in neuropsychopharmacology.

“Fool to Do Your Dirty Work”: Do Women’s Tolerance of Benevolent Sexism in Heterosexual Relationships Moderate Relationship Labor and Satisfaction?

Presenter(s): Elliot Mathis

Advisor(s): Dr. David Frederick

Heteronormative and gender-role-specific beliefs around empathy in romantic relationships are common. Although many women feel affirmed by them, these beliefs can lead to women burning out on performing most of their relationship’s emotional labor (Harrison, 2002). Until recently, the importance of one type of relationship labor has been underappreciated and under-researched: Hermeneutic. This relationship labor has recently been conceptually defined as the effort to interpret another’s emotional experience, and mental effort used for ruminating or problem-solving (Anderson, 2023). Hermeneutic labor involves silent mental effort and time spent thinking about their partner’s emotional experiences and needs, effectively communicating with their partners, and managing their partner's emotions. This correlational study sampled over 500 adult women from across the United States, recruited via the online survey panel Connect. Beliefs were reported on benevolent sexism, their own and their perception of their partner’s hermeneutic relationship labor, and subsequent associations with relationship quality. Using satisfaction and belief scales, results supported some of this study’s hypotheses, demonstrating that, on average, US women reported feeling as if they engaged in more hermeneutic labor in their relationships than their partners. There was little evidence supporting that women who

reported lower support for benevolent sexist ideology were often less satisfied with their relationships in the presence of imbalanced labor than women who agreed. Relationship dissatisfaction is most likely to occur when any woman, regardless of benevolent sexism beliefs, performs substantially more emotional labor relative to a male partner's labor. When women and men buy into these ideologies, while potentially reaping psychological rewards for a select group in line with stereotypical beliefs on empathy and relationships, it can further the emotional disconnect and distress between them in the long term, and contribute to potent cultural sexism (Barreto, 2023; Christopher, 2006).

How do Coping Styles Predict Future State Optimism in College Students During COVID-19?

Presenter(s): Vivian Nguyen

Advisor(s): Dr. Brooke Jenkins Dr. Julia Boehm

Optimism contributes to the development of greater resilience, which is an important factor connected with overall well-being in the face of adversity. Emerging research indicates that state optimism, one's temporary positive outlook in life given a specific context or timeframe, better showcases fluctuating optimism in the face of immediate adversities compared to long-term trait optimism. As such, it may be worth conducting further research on predictors of state optimism to find ways to enhance resilience development. How individuals cope may be a key element in their state optimism levels. Coping strategies can be grouped into overarching styles, including avoidant, emotion-focused, and problem-solving coping. Our research sought to explore the link between coping styles and state optimism among college students. Data was collected from 292 students during the height of the COVID-19 pandemic via a questionnaire assessing coping mechanisms in May 2020 and a second questionnaire assessing state optimism levels in September 2020. Linear regressions were performed to analyze how different coping styles predicted state optimism. When including all three coping styles in one combined model, results revealed avoidant coping as a significant negative predictor of optimism, with greater avoidant coping linked to lower state optimism, $b = -.551$. Meanwhile, problem-solving coping was moderately correlated with state optimism, $b = .343$. Study results underscored the importance of targeting avoidant coping while fostering problem-solving coping in college students in order to enhance their state optimism, which may then have downstream benefits for resiliency and mental well-being.

The Emotional Burden of Climate Change: Climate Distress and Burnout Among Environmental Practitioners

Presenter(s): Analisa Vavoso

Advisor(s): Dr. Richelle Tanner

With an increased focus on the impacts of climate change, previous research has found a link between climate change and negative mental health impacts. Climate distress and impairment are two aspects of mental health impacts from climate change. Climate distress spans the emotions anger, anxiety, and sadness, which broadens the scope of the phenomenon beyond

climate anxiety and ecological grief. While previous studies have explored climate change's mental health impacts among youth and the general population, they have largely overlooked environmental practitioners—a population uniquely at risk due to their close connection to environmental issues. This study surveyed 161 environmental practitioners, including scientists, educators, graduate students, professors, nonprofit employees, and government workers, using the Climate Change Distress and Impairment Scale, Burnout Assessment Tool, and questions on pro-environmental behavior (PEB). 68% of participants experienced high levels of climate change distress, and 47% were clinically at risk of or actively experiencing burnout. Environmental practitioners experienced 31% higher levels of climate distress than the general public. Women and non-binary participants experienced higher climate change distress than men ($p < 0.001$). Younger participants experienced the highest levels of both climate distress and burnout ($p = 0.004$, $p = 0.01$). Nonprofit employees experienced the highest rates of climate change impairment ($p = 0.009$). Results showing that nonprofit employees and younger individuals experience higher levels of burnout and climate distress align with anecdotal reports within the field of environmental practitioners. Further research must be done on this essential population to mitigate the negative mental health consequences of climate change.

AF209B

Moderator: Dr. John Hunter

Integrated Educational Studies

College Readiness Curriculum for First-Generation College Students

Presenter(s): Erin Simmons

Advisor(s): Dr. Quaylan Allen

A raising issue in education is the prevalence of first-generation college students and their ability to succeed in institutional spaces. First-generation college students are defined as the first individual in their immediate family to go to college and complete a BA degree. First-generation students differ from continuing generation students in that continuing generation students have parents that have attended a 4-year institution and completed a BA degree. The difference in whether or not a student is first to graduate from college is a significant predictor of their success and can present many additional barriers. These barriers include access to college, cultural knowledge about college, academic preparedness, social preparedness, degree attainment, well-being in college, and more. Due to these differences, first-generation college students require additional support before and throughout their college careers that are not widely available. Many studies have explored this topic and identified specific factors that affect first-generation students and student needs. There have also been research evaluating various college readiness programs that have proved successful in supporting first-generation students yet there are very few college readiness programs available to students and very few studies outlining how and why these programs are significant. This study addresses how college readiness curriculum can be

useful to first-generation students by exploring the following question through an experimental design: What impact can college readiness curriculum have on first-gen middle and high school student knowledge, interests, and preparation for college?

Film

Being In-Between: Queer Reorientation and Ambiguity in Film

Presenter(s): Carol Liddle

Advisor(s): Dr. Kelli Fuery, Dr. Erica Agüero

“Being In-Between: Queer Reorientation and Ambiguity in Film” seeks to develop a new understanding of how queer individuals use films to better understand their place in the world after the initial realization of their queerness. To achieve this, a phenomenological approach is adopted. Drawing on classical phenomenologists such as Husserl and Beauvoir, the term “orientation” is defined as psychological stability and intentionality toward one’s future. Then, building on the work of modern phenomenologists such as Ahmed and Beugnet, the project examines how gender, sexuality, and other personal experiences can disrupt one’s orientation, leading to disorientation. The concept of “reorientation” is then introduced as a novel concept in phenomenology to argue that the process of moving from disorientation to a new sense of self in a queer context is always gradual, rather than immediate. Through personal accounts of films such as Gerry (2002, Van Sant), Céline (1992, Brisseau), Vive L’Amour (1994, Ming-liang), and Tropical Malady (2004, Weerasethakul), it is demonstrated how the experience of watching a film can influence the process of queer reorientation. By analyzing specific scenes, it is shown how specific phenomenological ideas can be mapped onto films while viewing, and how this process can be applied to film experiences outside those discussed directly. Ultimately, this project contributes the concept of “reorientation” to phenomenological discourse by bridging classical and contemporary perspectives in the sub-discipline, and reveals a method for using phenomenology to understand the influence that film has on the queer experience.

Psychology

Enhancing Student Well-Being: The Impact of the Flourish App on Positive Emotion and the Moderating Role of Perceived Stress

Presenter(s): Alexandra Kraft, Jess Savela-Gomez

Advisor(s): Dr. John Hunter

Objectives: Flourish is an evidence-based, AI-powered app that delivers positive psychology interventions through personalized well-being practices and real-time emotional support. We hypothesized that using the Flourish app would significantly increase positive emotions compared to a control condition, with perceived stress levels moderating this relationship such that individuals reporting higher stress at baseline would experience more significant benefits. **Methods:** We conducted a randomized controlled trial (RCT) with 486 college students. In this 6-

week longitudinal study, participants were randomly assigned to either use the Flourish app twice weekly or receive no additional resources beyond existing institutional offerings. Participants (79% female; mean age = 20.34) completed assessments at four time points (weeks 0, 2, 4, and 6) using validated measures including the Subcomponents of Affect Scale (SAS; Jenkins et al., 2023) and Perceived Stress Scale (PSS-4; Cohen et al., 1983). A linear mixed-effects regression model was used to analyze the data. Results: Analysis revealed a significant condition by time interaction ($B = 0.22$, $p = .02$), supporting the hypothesis that the Flourish app increased positive emotions compared to the control condition. Furthermore, baseline perceived stress significantly moderated this association ($p < .001$), such that greater perceived stress at the start of the study predicted greater improvements in positive affect from baseline to study completion. Conclusions: These findings suggest that digital positive psychology interventions may increase positive emotion and be especially beneficial for students experiencing high levels of stress, offering important implications for university mental health initiatives. Future research should examine specific app mechanisms, longer-term outcomes beyond self-report measures, and the potential benefit of incorporating social components like "Flourish Buddies" into the intervention.

The Effects of Sexual Trauma on Sexual Expression

Presenter(s): Sophie Camilleri

Advisor(s): Dr. Jessica Walker

Sexual violence affects about half of all women and a third of all men in their lifetimes (CDC, 2022), yet the effects of sexual violence are under-researched. It is crucial to gain a better understanding of this taboo, yet prevalent issue in our society to help those who are affected. The present study examines the relationship between trauma from sexual violence and the use of hypersexual and asexual behaviors as coping mechanisms to understand how survivors of sexual violence navigate their sex lives during recovery. We surveyed 107 participants (75.5% woman; 14.7% men; 9.8% gender non-conforming; ages 18-30) to better understand the likelihood of asexual and hypersexual behaviors in response to sexual trauma. In a follow-up qualitative study, with 27 participants (77.8% women; 11.1% men; 11.1% gender non-conforming; ages 18-30), survivors of sexual violence responded to open-ended questions about their sexual expression. These changes in sexual expression can be explained by changes in brain chemistry due to trauma or by sexual scripts and objectification theories. This study takes a closer look at how hypersexual and asexual behaviors co-exist in survivors of sexual violence, using the passage of time as a moderating variable. This study ultimately seeks to humanize survivors of sexual violence and destigmatize their efforts to reclaim their autonomy through sex.

AF209C

Moderator: Dr. Anna Palomar

Biological Sciences

Leveraging the Genetic Variation in Wild Chia (*Salvia hispanica* L) Accessions to Identify Drought Tolerant Plants.

Presenter(s): Carlos Alderete, Sophie Pel

Advisor(s): Dr. Hagop Atamian

Chia is an emerging crop recognized for its nutritional seeds. Adapted to arid regions, chia is cultivated for its nutritious seeds for human consumption and, potentially, for its leaves as livestock feed. Currently, alfalfa is the predominant crop used as a livestock feed but has high water demands, sparking concern over water-conservation practices. Our study found that the commercial (domesticated by humans) chia variety uses up to 38% less water than alfalfa, making it a water-efficient crop that can help mitigate water scarcity threats and promote sustainable agriculture. The genes of a plant affect its development and characteristics. Wild chia plants (not domesticated and manipulated by humans) may have unique genes enabling them to grow with even less water, but this valuable genetic variation has not been investigated in chia. Thus, the objective of this project is to investigate the water use efficiency (WUE) or drought tolerance in wild chia accessions to find plants that are even more drought tolerant than the commercial variety. Wild and commercial chia accessions were grown in the laboratory's growth chamber, and WUE was calculated by dividing the plant's growth with the amount of water lost in the pot within 24 hours. The results indicated high variability in WUE, with some wild accessions having higher WUE than the commercial variety. Moreover, we crossed the commercial variety with one of the wild accessions with high WUE, and their second-generation seeds were analyzed. Some of the progeny displayed high WUE, while others showed low WUE. This trait segregation will allow genomic analysis to examine WUE at a genomic level between the two accessions. This will ultimately lead to the development of molecular markers and breeding programs, creating chia varieties with high WUE that could be commercialized, reducing the reliance on water-intensive crops.

Identifying and Exploring Phytochemicals in Herbal Insomnia Treatments

Presenter(s): Rana Ranjbar

Advisor(s): Dr. Hagop Atamian

Over 30% of the global population experiences insomnia, a sleep disorder that can significantly impair one's daily functioning. While there is no definitive cure for insomnia, it can be effectively managed. Chinese herbal medicine, which has been used for thousands of years to treat various disorders, including insomnia, offers a possible solution. However, many individuals remain skeptical about the efficacy of Chinese herbal remedies due to a lack of comprehensive scientific evidence. Therefore, it is essential to investigate the scientific basis of these treatments. This

research aims to explore the chemical compounds present in the plants used in Chinese herbal medicine for treating insomnia, with the goal of gathering scientific evidence to support their effectiveness in managing the disorder. To achieve this, a comprehensive list of plants used in herbal medicine for insomnia treatment was compiled, along with the chemical compounds identified in these plants by independent research groups. The chemical compounds of these plants were analyzed to identify common ones that may contribute to their therapeutic effects. Our findings suggest that caryophyllene, a compound shared by ten of the studied plants, may partly explain the efficacy of these herbal treatments for insomnia. Caryophyllene binds to specific brain receptors that alleviate anxiety and depressive states, which are often associated with insomnia. Additionally, limonene, another compound found in these plants, is recognized for its neuroprotective effects, which include alleviating anxiety and stress, promoting sleep, and potentially extending sleep duration by increasing the levels of 5-HT and GABA in the brain. Further research will focus on exploring how this vast diversity of chemical compounds in plants affects insomnia and its physiological responses in the body.

Food Science

Evaluating Chia as a sustainable alternative for livestock feed

Presenter(s): Sophie Pel

Advisor(s): Dr. Hagop Atamian

Alfalfa is a nutritious livestock feed source but poses significant challenges in drought-prone areas due to its high water requirements. Chia is an emerging crop that uses up to 38% less water while being able to thrive in the same environments as alfalfa. This is significant as replacing alfalfa with chia would help conserve water. The goal of this project is to use proximate analysis to assess the nutritional quality of chia leaves. Using the kjeldahl method, the crude protein of alfalfa and chia leaves were quantified. The results under our experimental conditions indicated that chia leaves have around 22% crude protein compared to 15% in alfalfa. Moreover, our amino acid analysis identified similar amino acid profiles between alfalfa and chia. However, there were significant differences in the quantity of some amino acids. Finally, our analysis of the phenolic acid profiles of chia and alfalfa, using high performance liquid chromatography, identified seven distinct phenolic acids in chia leaves, which were different from those identified in alfalfa. These findings suggest that water efficient chia could serve as a sustainable alternative to water demanding alfalfa, resulting in significant water conservation benefits.

Software Engineering**Toward Personalized Virtual Reality Gait Training System for Full-Body Obstacle Avoidance Using Real-Time Motion Analysis****Presenter(s):** Alexandra Fomina, Quillan Gee, Laurel Latt**Advisor(s):** Dr. Trudi Qi

This research presents a personalized virtual reality (VR) gait training system that combines advanced motion tracking, real-time analysis, and adaptive obstacle scenarios to support rehabilitation, enhance immersion, and improve safety in VR environments. Developed in Unreal Engine 5, the system uses Sony Mocopi wearable sensors and the Meta Oculus Quest 2 headset to simulate realistic full-body obstacles—such as tree branches, rocks, and logs—that mirror real-world challenges in a safe, controlled setting. Full-body motion is captured at multiple key points, and user movements are classified in real time using a decision tree algorithm trained on data from multiple users. The algorithm uses validated motion thresholds to detect ducking (at least 12 cm head dip), stepping over (minimum 11.5 cm foot lift), and side-stepping (based on lateral hip displacement), and can also identify combinations of these actions. Movements are analyzed hierarchically: ducking is assessed first, followed by stepping over (distinguishing left vs. right foot), then side-stepping. To address sensor drift and synchronization issues, a real-time bidirectional calibration mechanism integrates positional and rotational data, allowing the virtual avatar to closely mirror the user’s physical movements. A single-click calibration interface enhances usability and accommodates users of varying heights. Additionally, adaptive motion algorithms improve avatar fluidity and reduce motion sickness during self-paced treadmill walking by smoothing transitions in foot movement data. Initial testing confirms the system’s ability to detect obstacle-avoidance strategies with high accuracy in real time. Future work includes conducting user studies and developing machine learning models to predict optimal movement strategies for personalized gait rehabilitation.

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