

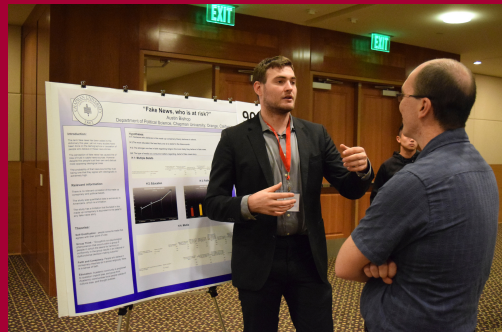
# STUDENT SCHOLAR SYMPOSIUM

FALL 2020

WEDNESDAY, DECEMBER 2

FALL SESSION

# ABSTRACT VOLUME



# Message from the Director

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Greetings and welcome to the Fall 2020 Chapman University Student Scholar Symposium!

Student Scholar Symposium celebrates the remarkable scholarship and creativity conducted by Chapman students. Student Scholar Symposium is sponsored by the Center for Undergraduate Excellence, which is the first stop and the central hub for students to learn about and engage in undergraduate research and creativity activity; and to discover the wide range of prestigious external scholarships available. Our student presenters reflect the diversity of academic and creative disciplines thriving within the Chapman community.

This year we have moved the Fall Student Scholar Symposium to this virtual platform where you can attend a live Zoom meeting to connect with the student and discuss their research/creative activity. The virtual symposium allows our students to showcase their research and creative projects either through a poster or an oral presentation.

Our virtual symposium would not have been possible without the extraordinary effort by the CUE staff, Lisa Kendrick, Operations Manager, and Jackie Coyne, Administrative Assistant, who designed and developed the event. A special thanks to both of them.

Thanks to all the student presenters and their faculty mentors!

Dr. Julye Bidmead

Director of the Center for Undergraduate Excellence at Chapman University

## Schedule of Events

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### Wednesday, December 2

<b>Poster Presentation- Session I</b>	9:00AM-10:30AM
<b>Oral Presentations-Session I</b>	10:30AM-11:30AM
<b>Poster Presentations-Session II</b>	11:30AM-1:00PM
<b>Oral Presentations-Session II</b>	1:00PM-2:00PM
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## **Art**

**1. *The Leaky Female Body***

**Presenter(s):** Nicole Daskas

**Advisor(s):** Micol Hebron

The Leaky Female Body examines the history of feminist performance art, specifically focusing on the use of bodily fluids in art. This is accomplished through study of art gallery archives beginning in the late 1960's, art books, and interviews with artists. Women artists utilizing their bodies in their work has long been used as a form of activism. The body is reclaimed or becomes a form of protest in response to bodily censorship, trauma, and existence in a patriarchal society which considers a white male body to be the default, effectively othering the female body. By analyzing and archiving artists and works relevant to my own art practice, I am beginning to accumulate an important history of feminist activist works which are largely underappreciated and left out of the traditional Western art historical canon. In addition to archiving these works, I am also creating my own set of performance self portraits in relation to and inspired by my findings. These works function as contemporary iterations of issues women have continued to face throughout history. Art history is skewed, predominantly focused on male painters hailed as geniuses. Women became muses and objects, barred from studio art classes. Women later turned to mediums such as performance and video, and while this allowed for the creation of truly radical works, these mediums are not commodifiable. The lasting effects of these injustices includes failure to historicize women artists as well as a vast gender wage gap. This research begins to archive the immeasurable contributions of performance artists to feminist history, outlining the radical ways in which the leaky body has been used to resist oppression and injustice.

## **Biochemistry and Molecular Biology**

**2. *CowN: Mo-Nitrogenase's Guardian Against CO Inhibition***

**Presenter(s):** Max Strul, Kiersten Chong, Chloe Garcia, Terrence Lee, Ruchita Kharwa, Michelle Jin

**Advisor(s):** Dr. Cedric Owens

Fertilizer and more specifically ammonia production is an extremely critical aspect of modern agriculture given the high demands of crop production. These high demands require a greater need for fertilizer, but this comes at a cost: a lot of energy and pollution. The industry standard Haber-Bosch procedure of ammonia production requires extreme pressures and temperatures, making it unsustainable in the long term, especially given the rising needs. Alternative methods of ammonia production include bio-synthesis. The enzyme Mo-nitrogenase from *G. diazotrophicus* produces ammonia with minimal waste, only requiring ATP, hydrogen, and nitrogen. In order to make this enzyme a viable alternative, it's efficiency must be maximized, including in environments with possible inhibitory conditions. A known inhibitor of the enzyme nitrogenase is Carbon Monoxide (CO). This inhibition renders the enzyme inactive, however, another protein, known as CowN, seems to protect against the inhibition of CO. This protein-protein interaction is one that is unknown, so our lab aims to characterize the interactions between these two proteins in order to understand how to maximize the efficiency of the enzyme for its future use in the industry of ammonia production.

**3. *Molecular Mechanisms of Ligand-Dependent REVERB Activity***

**Presenter(s):** Ashley Nichols

**Advisor(s):** Dr. Marco Bisoffi

Inflammatory autoimmune diseases, such as multiple sclerosis, affect over 23 million Americans every year. The Solt Lab studies the influence of several transcription factors on the development of a specific subset of CD4+ T helper cells, TH17 cells. Determining the role of these transcription factors and cells in the onset of autoimmune diseases may allow us to develop safer, more specific, and more effective therapeutics for the treatment of TH17-mediated autoimmune diseases. REV-ERB $\alpha$  and REV-ERB $\beta$  are ligand-regulated nuclear receptors (NR) that have the ability to repress transcriptional activity within cells. The Solt Lab previously determined that these NR's play a role in repressing transcription and pro-inflammatory cytokine production in TH17 cells. This finding suggests that these NRs aid in preventing pathogenesis of TH17 cells and could be targeted for autoimmune disease treatment. Endogenous and synthetic ligands are known to regulate both REV-ERB $\alpha$  and REV-ERB $\beta$ . However, it is not well understood how these ligands affect the REVERBs' interactions with their corepressors, NCoR and SMRT, and thus, their transcriptional activity. A better understanding of how ligands affect the interactions between these NRs and their corepressors could be a key factor in the development of autoimmune disease treatments that target TH17 cells. In order to investigate these interactions, mammalian two-hybrid assays were conducted using a variety of REV-ERB and NCoR mutants which tested the specific regions within the proteins responsible for interactions. We determined a mechanism for NCoR binding to REV-ERB $\alpha$  and demonstrated that synthetic ligands lead to increased degradation of the REV-ERBs. These findings shed some light on the previously unknown molecular basis of interaction between REV-ERB $\alpha$ , REV-ERB $\beta$ , and their corepressors, NCoR and SMRT. This understanding gives more information toward understanding REV-ERB-mediated transcriptional repression in TH17 cells, which can be used for future development of TH17-mediated therapeutics.

## **Biological Sciences**

**4. *How Effective is Hagfish Slime at Clogging?***

**Presenter(s):** Luke Taylor

**Advisor(s):** Dr. Douglas Fudge

Hagfish slime has been shown to act as a defense mechanism by clogging the gills of gill-breathing predators and hindering the flow of water. Even extremely dilute concentrations of hagfish slime can retain remarkable quantities of water and clog effectively. However, it is unclear how effective hagfish slime is at clogging relative to other substances and the mechanisms by which it clogs. The purpose of this research is to better understand the clogging capabilities of hagfish slime and the mechanisms behind its function. Using a custom clogging assay, we quantified the ability of hagfish slime and other hydrogel materials to clog. We found that hagfish slime was able to effectively clog at concentrations up to 3,000 times lower than those of the hydrogels tested. Furthermore, hagfish slime was able to produce extremely low drain rates at concentrations as dilute as 10 mg/L. This implies that hagfish slime is extremely effective at clogging relative to other substances and is able to do so even at low concentrations. Understanding the mechanisms of clogging could be useful in practical applications such as shark repellent, as well as other industrial applications.

## **Computational Science**

**5. *Presentation Title: Norepinephrine and Global Brain Dynamics: a TMS-EEG-Pupillometry Study***

**Presenter(s):** Emma Krivoshein, Jake Gavenas, Joanna Pak

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

The brain is a dynamic system: many different global activity patterns can emerge from similar underlying network structures (Deco et al., 2015). How shifts between global activity patterns are achieved is not currently known. One candidate is norepinephrine (NE), a neuromodulator that is widely present in the brain. NE affects gain, a network parameter that describes how much regions influence each other's activity, and has been proposed to be involved in shifts between integration and segregation (e.g. Shine et al., 2019), a central dichotomy in global brain dynamics (Deco et al., 2015). Crucially, the human pupil can reliably index NE release, because the brain's source of NE (the Locus Coeruleus) projects to pupil dilator muscles (Joshi et al., 2016). In the present project, we investigate global activity patterns are related to NE levels in the brain, indexed by pupil size. We use a perturbation paradigm by administering transcranial magnetic stimulation and recording the brain's response to stimulation with electroencephalography, a technique that has previously been applied to analyze global brain dynamics (Sarasso et al., 2013). We investigate whether aspects of the brain's response to stimulation is modulated by pupil size, which would support arguments that norepinephrine is involved in controlling global brain dynamics.

## **English**

**6. *Cottage-Core: An Aesthetics Discourse Analysis***

**Presenter(s):** Brie Byers

**Advisor(s):** Dr. Jan Osborn

This project analyzes the "Cottagecore Aesthetic" in social media discourse, using Burke's theory of language as symbolic action and terministic screens as an analytic method. Through the examination of language as performative, symbolic, and doing work in the world, the choice of "Cottagecore" to describe and identify an aesthetic reveals an attempt to deflect the reality of the 2020 Coronavirus Pandemic as well as the divisive reality of the United States. Selecting an aesthetic that reveals a world of peace, serenity, and tranquility is a screen ignoring inequalities, systemic disadvantages, and oppression. Paradoxically, the decision to choose this aesthetic does not actively contribute to a desire for social change; instead, this choice becomes a form of blind ignorance that reflects the fairytale ideals that are implemented in the founding of the Cottagecore Discourse.

**7. *Plastics Consumption and its Effect on Young Audiences***

**Presenter(s):** Adrienne Paulu, Carissa Nelson, Gloria Baek

**Advisor(s):** Sam Risak

The majority of global climate change is caused by human activity and its relationship with the planet. The economic system behind our way of life is really to blame. Consumerism is one of the world's most dominant contributors to Earth's rising temperature and is a result of our capitalist society, in which the expectations of wealthy corporations are met prior to facing the harsh reality that if we continue this way, there will not be a planet for us to inhabit. So the big question is: What can we do to help? One of the biggest examples of corporate exploitation of consumerism is the plastics industry. Put into simple terms,



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the more plastics are consumed, the more pollution occurs, the more our environment suffers. Our focus of this project is to create a graphic novel with the message of raising awareness for the harmful effects of plastics consumption caused by our capitalist society while also incorporating other visual forms like pictures to help convey our message. High plastics consumption results from powerful companies and businesses promoting that plastics are cheap, versatile, lightweight and an “irreplaceable” material. One example is plastic water bottles. Corporations have capitalized on our lack of clean drinkable water and have literally bottled and sold it in plastic bottles which adds to the issue of plastic pollution. Our reckless use of plastics has not only contributed to a high increase in pollution, but also has had a detrimental effect on our environment; mainly, our oceans and marine life. We believe that the high plastics consumption is due to lack of awareness on the impact, and the alternative sources of plastics. We must find a way to reconsider our options regarding plastics waste such as using reusable water bottles and taking our own bags to grocery stores. And on a larger scale, consider what we must do to significantly slow the rise of plastics consumption.

### **Environmental Science and Policy**

#### **8. *The Effects of Animal Agriculture on the Environment***

**Presenter(s):** Kate Carter, Lexi Ascher, Josh Simkovitz

**Advisor(s):** Sam Risak

The purpose of our children's book is to simplify the complex issues of climate change and present short and long-term solutions to our audiences, specifically young children. The book utilizes visuals and language to convey the message of climate change to younger audiences. The use of multimodality allows the information to be portrayed in different ways that are comprehensible for a younger audience. We used detailed pictures and clear language to illustrate the harm of animal agriculture on a farm. The combination of illustrations and transparent wording allows young readers to match the issue from the outside world and connect it with visual representations. Children's books are a great way to have younger readers begin to understand real life problems. The main character in the story, Franny, grows up on a farm and she sees how animal agriculture affects the environment around her. These detrimental impacts include deforestation, effects on the aquatic ecosystem, methane gas released from farm animals, water consumption and animal exploitation to produce animal products. All of these situations contribute to problems with the environment and are doing more harm than good. Based on our research, eating less meat and consuming less animal products, reduces the negative environmental impacts of animal agriculture. In the end, Franny makes a personal decision to eat less meat and consume less animal products to minimize the harmful effects on the environment. Teaching children about complex environmental issues at a young age can help shape the future to be more environment-friendly.

### **FFC**

#### **9. *Tlāloc: He Who Makes Things Sprout***

**Presenter(s):** Cassandra Garate

**Advisor(s):** Dr. Eileen Jankowski

The Aztec god of rain and fertility who causes famine and drought, along with intensity and chaos, Tlāloc is understood to be one of the most essential and respected deities of Mesoamerica. His name derives from the word tlalli, meaning soil or earth in Nahuatl. As one of the most ancient Central American deities,

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Tláloc is often referred to as the "Green One," and his name means "in the earth." In Aztec mythology, Tláloc was held as the governor of the Third Sun, a world dominated by water. He also oversaw the fourth heaven called Tlálocan, the "Place of Tláloc," which is graciously described as a paradise of everlasting spring and flourishing vegetation. Tláloc and the Tlaloques, a group of supernatural beings that assist him, rule this euphoric destination for new-born children, women who died in childbirth, and those who unfortunately died violently from water-related causes. This Mexican god is profoundly tied with agriculture, as his worshippers desperately depend on him to bring forth an abundance of rain for their crops. Although bountiful offerings to Tláloc continue to be found in various mountain peaks and caves, the most sacred shrine is located on an extinct volcano in Mexico City named Mount Tláloc. These offerings and sacrifices in the past were quite sinister and devastating, but they were extensively viewed as essential in ensuring seasonal rain periods for a successful harvest. His dissatisfaction and disappointment in the Aztec people can appear through his unforgiving anger in abusing his destructive gifts of thunder and lightning.

#### **10. *Interpreting the Naga and it's Comparison to Greek Mythology***

**Presenter(s):** Claudia Heath

**Advisor(s):** Dr. Eileen Jankowski

The mythical serpent race popular amongst many Southeast Asian cultures was first depicted in India and is often found in Hindu and Buddhist iconography. Nagas typically assume three physical forms, either as human, partial human-serpent, or whole serpent. They are associated with the role of the guardians of the underworld, where the realm is beautifully ornamented and filled with precious gems and other treasures. They commonly represent the embodiment of terrestrial waters, often residing in oceans or mountain springs. They are also thought to bring disastrous events and debacle if their natural habitat is disrespected by humankind. Although they are occasionally portrayed negatively with their dangerous power and venom, they are generally held in high regard as they also represent fertility and prosperity if worshipped properly. Many interpretations of the Naga can be linked with traditions found in Greek mythology, such as Gorgons, through their presence in the underworld and monstrous interpretations. The frightening reputation of the 3 gorgon sisters, Medusa, Stheno, and Euryale, can be linked to the threatening identity of Nagas, explaining why fearful images of both myths are commonly seen in temples and shrines for protection from bad spirits. The idea of "appearance vs reality" can also be applied to both mythological creatures due to their duality.

#### **11. *Loki and Prometheus: The Tricksters of Mythology***

**Presenter(s):** Allison Major

**Advisor(s):** Dr. Eileen Jankowski

Loki is the trickster god of Norse Mythology, famous for his silver tongue and his ability to utilize his words in order to get out of difficult situations. He is unique in that he was never truly classified as good or evil among the gods. He appeared not to care for other gods and was often the direct cause of their problems, many of which he exacerbated. One of the most famous Norse myths tells of Baldr, who was killed by Hodr, the blind god, when Loki fooled Hodr into throwing mistletoe at Baldr, who had been made immune to everything else. Afterwards, Loki prevented Hermodr from rescuing Baldr from the underworld. Prometheus is the trickster god of the Greek pantheon, and he and Loki share one other key similarity: their torture. Loki's was a punishment for his actions relating to Baldr, and for Prometheus it was due to his introduction of fire to the humans. Both were chained to a rock and tortured: Prometheus' liver was

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attacked by an eagle while Loki was left with poison dripping into his eyes. As outsiders, Prometheus being a Titan rather than an Olympian god and Loki being different from the other gods, both had cause to act against the wishes of the king god, Zeus and Odin respectively. Both gods remain vital parts of their respective mythologies, and the parallels between them are evident, revealing that regardless of the culture, there is an important element to the trickster god that cannot be ignored. Loki and Prometheus are able to act outside of the main pantheon, creatively adapting their methods to fit their goals without the constraints placed on the ruling gods.

#### **12. *The Chupacabra: The Monster of Mexico and Puerto Rico***

**Presenter(s):** Gustavo Vazquez

**Advisor(s):** Dr. Eileen Jankowski

The chupacabra is a beast-like creature that was developed in Mexican and Puerto Rican culture. It is somewhat of a modern legend since its legend dates back to only 1995, however now children grow up hearing tales about it and it has become a popular legend within both Mexican and Puerto Rican culture. The chupacabra is said to be no more than four feet in length and can stand on all fours as well as its hind legs. It's skin resembles that of a reptile, however its movements resemble more of a canids. It has sharp quills running down its back, sharp claws, and razor sharp fangs. It's name translated to english means blood sucker. It acquired its name because people reported dead livestock that were fully intact but had had the blood sucked out of them. Often times people claim they saw the chupacabra and are told that they most likely saw a coyote or a dog with mange. In my poster I want to explore how the chupacabra is viewed in Mexican and Puerto Rican cultures, even though it has only recently become a legend. I also hope to explore the similarities that the chupacabra shares with vampires, besides the obvious which is that they both suck the blood of their victims.

## **Film**

#### **13. *Mulan: An Exploration of Culture and Representation in Hollywood***

**Presenter(s):** AnneMarie Okuhara, Bernadine Cortina, Hung Le, Ryan Nakahara, Jerry Zou

**Advisor(s):** Dr. Stephanie Takaragawa

'Mulan: An Exploration of Culture and Representation in Hollywood' is a presentation and detailed analysis of various representational, cultural, and minority-related issues in the context of Hollywood and western media. The presentation will focalize specifically around the recent live-action remake of the 1998 film "Mulan". The remake, premiered in March 2020, received critical backlash from various audiences (mostly from the BIPOC community), bashing the film for its misrepresentation of Ancient China and Ancient Chinese culture. Through this misrepresentation, the Hollywood film ultimately reflects views of cultural appropriation, misogyny, and overall minority underrepresentation in the United States. The research presents the backlash that lead actress Liu Yifei received over the course of the film's wave of criticism. Many uneducated and uninformed viewers raced to Twitter to attack her performance and 'cooperation' with this controversial film, however it is important to consider the relationship between Chinese Americans and the CCP (Chinese Communist Party), as it is incredibly risky to speak out against the CCP due to the possibility of being blacklisted by the Chinese market. Overall, the presentation encompasses and analyzes the issues stirred by Mulan 2020, the response of the BIPOC community, and how the controversy is ultimately a representation of Hollywood media when dealing with portrayal of foreign cultures.

## **Health Sciences and Kinesiology**

### **14. COVID-19 Viral Testing Disparities in Los Angeles City**

**Presenter(s):** Laura Cyphers, Elmer Camargo Pena, Alexis Hernandez, Eva Stanton

**Advisor(s):** Dr. Jason Douglas

Hispanic and Black communities have been disproportionately impacted by COVID-19-related morbidity and mortality (California Department of Public Health, 2020). Inequitable access to viral testing resources may have exacerbated these COVID-19-related racial and ethnic health disparities. For example, reports from the Los Angeles Department of Public Health revealed glaring viral testing disparities in April 2020 (early pandemic), with predominantly White communities in Los Angeles County receiving 65% more tests than Hispanic and Black communities. In response, California statewide testing was expanded for communities of color (Vann et al., 2020). To investigate access to viral testing in Los Angeles City, the current study examined geographic access to testing sites offering reverse transcription polymerase chain reaction (RT-PCR) tests across 105 Los Angeles City ZIP Code Tabulation Areas (ZCTA). Census data was used to identify majority Black and Hispanic ZCTAs and majority White ZCTAs. A buffer radius of 2.44 miles was then applied to determine the number of testing sites within this distance of majority Hispanic and Black, compared to majority White, ZCTA centroids. This distance metric, which represents the average distance to a hospital in the U.S., has been used in recent research investigating COVID-19 treatment resource access in other communities (Douglas & Subica, 2020). An independent samples t-test indicated that there were significantly more testing sites within 2.44 miles of majority Hispanic and Black ZCTAs compared to majority White ZCTAs in Los Angeles City ( $t(98) = -4.885, p < 0.001$ ). These findings emphasize the positive impact of the city's policies implemented in early May to make testing site access more equitable. Although better geographic access to testing sites is evident, this study did not explore test rates at these sites. Further accessibility questions also remain regarding the impact of language barriers, inequitable access to healthcare and health insurance, and immigration status on testing disparities.

## **Mathematics**

### **15. The Poincaré Duality Theorem and its Applications**

**Presenter(s):** Natanael Alpay

**Advisor(s):** Dr. Mihaela Vajiac

During the SURF fellowship studied various topics of differential forms in algebraic geometry, in talk we will talk in particular about the Poincaré duality. First let us begin with the definition of a dual space of  $V$  denoted by  $V'$ : is the vector space of all linear functionals on  $V$ , in other words  $V' = L(V, F)$ . Let  $M$  be a differentiable manifold with atlas  $\{(U_a, \phi_a)\}$ . We say that the atlas is oriented if all transition functions  $g_{ab} = \phi_a \circ \phi_b^{-1}$  are orientation preserving, and that the manifold is orientable if it has an orientable atlas. For an oriented manifold  $M$  there is a pairing the integral of  $H^q(M)$  tensor  $H_c^{(n-q)}$  to the real line  $\mathbb{R}$  (the integral of the wedge product of two forms). The first version of the Poincaré duality asserts that this pairing is non-degenerate whenever  $M$  is orientable and has a finite good cover, that is:  $H^q(M) \cong (H_c^{(n-q)}(M))^*$  where from forms are finite dimensional.

## **Music**

**16. *Seeing a Melody: Explaining the Phenomenon of Synesthesia***

**Presenter(s):** Abigail Torrence

**Advisor(s):** Dr. Jessica Sternfeld

What does the world look like in the mind of an artist when they create their art? Creating the image in one's head, or writing out the music they hear, can be extremely hard to put into a real world setting – and this process is even harder to measure from an outside source. One way to further understand the mind of an artist can be measured through a disorder called “Synesthesia,” where a subject unwillingly experiences multiple sensations at once. Through the synesthetic process, the inside of an artist's mind can be seen to an average eye or ear through the works of many artists and musicians throughout time. This sense is divided into many different classifications based on the mixed sensations, but throughout this paper I analyze and discuss synesthesia involved with auditory or visual stimulation. Focusing on popular artist like Vincent Van Gogh, Franz Liszt, and Duke Ellington, I argue that studying synesthesia can help us understand a creative process every artist goes through.

**17. *The Dichotomy of Disco: 54 Degrees of Separation***

**Presenter(s):** Chitra Dassapa

**Advisor(s):** Dr. Jessica Sternfeld

The genre of Disco that ruled the late 1970s has often been considered cheesy in musical construction and intent, but with equal fervor has been regarded as iconic. In essence, music of the 1970s was a turning point for music production practices and the industry as a whole. Within the nostalgia for Disco music exists the notion that the genre was primarily white-dominated, when in fact Disco thrived because of Black singers, writers, producers, and industry executives such as Berry Gordy, the President of Motown Records. In this paper, I intend to offer a new perspective into the world of Disco , explaining how it is inherently a Black art form as well as how it changed the way music was distributed and received by listeners at the time. Motown's “hit” songs combined Gospel and Pop fusion vocalists, their usage of Blues-inspired strings and horns, and high-quality produced records. Additionally, President of Motown Records, Berry Gordy and his vision for music within the context of Black culture laid the musical groundwork for Disco to flourish. Clubs like Studio 54 became spheres for new freedoms to exist; patrons experimented with drugs and alcohol, partook in the sexual revolution thanks in part to the advent of birth control in the pre-AIDS era, and explored freedoms of gender identities. Thus, Disco music was not just a musical genre, but a lifestyle that lent itself to a variety of artistic frequencies beyond its central nature. It influenced everything from fashion to film to pop-art, in the decades of countercultures that followed. As the saying goes, “art imitates life imitates art,” but to truthfully understand the numerous, not-so-pretty facets to Disco, we must separate which artists were the imitators and which were the proprietors. In addition, this project combines a research paper with a multimedia creative art project to demonstrate four specific topics through an abstract and thought-provoking fashion.

## **Peace Studies**

### ***18. Women's Political Participation Aided by Constitutional Provisions in Post-Conflict African Nations***

**Presenter(s):** Roksana Gorgolewski

**Advisor(s):** Dr. Lisa Leitz

After two major continental conflicts, many African countries were forced to re-evaluate their constitutions and inherent political structures. This left a window of opportunity for greater female political participation as political leaders and members of the peacemaking process. This project will focus on selected African post-conflict states during the 1970's to 2000's that have re-written their constitutions. The general query asks whether those rewritten constitutions have contributed to greater gender equality in the legislature of those states and which constitutional provisions work best at promoting and maintaining gender equality. By studying Geisler's book *Women and the remaking of politics in Southern Africa* and Schnabel and Tabyshalieva's book *Defying Victimhood* to understand legitimacy of gender as a characteristic in constitutional drafting and how gender permeates in nations' customary law prior to constitutional change. Through this, it can be pinpointed how the new constitutions and provisions for gender have impacted gender equality in the legislature. The research will be conducted using mixed-methodology. The quantitative aspect of the analysis will relate to gender equality using percentages before and after constitutional changes and test the effectiveness of certain constitutional 'safeguards' to improve equality. Qualitative research will be conducted about a multitude of factors relevant to constitutional ratification. They include cultural factors, legislative history, and the history of gender equality of a nation both prior to and after conflict outside official bodies or institutions. The expected results are that constitutional safeguards especially quotas are effective in maintaining gender equality in legislature. Active civil women's organizations and the continual dedication of political parties and figures also aid in ensuring gender equality by acting as a safeguard mechanism.

## **Political Science**

### ***19. Making America White Again: Examining the Influence of Immigration on the Rise in White Supremacy in the United States***

**Presenter(s):** Melieka Fathi

**Advisor(s):** Dr. Ann Gordon

My research paper will examine the influence of immigration on the rise of white supremacy in the United States. My hypothesis is that the steady rise in immigration to the United States has resulted in an increase of white supremacist sentiment, due to the white community fearing they will no longer be a majority or in control of the social culture of the country. I would like to discuss this topic as I believe it is relevant to the major shift in the way politics and civic engagement is now portrayed in the United States, specifically due to the influence of recent presidential administrations. With the influx of immigrants in the United States, the immigrant identity began to take shape resulting in a serious impact on the social, economic and political culture of the country. Donald Trump's presidential campaign and its success lead to an overt praise for racist and discriminatory rhetoric; unleashing a new and incredibly passionate wave of white supremacy that seemed to be hidden till Trump's call to action. I will utilize psychological, historical, and socioeconomic theories and events to discuss my findings on the creation of white supremacy groups such as the Alt-Right and their motives to influence the direction of U.S. history based off of "Trumpism"

rhetoric and the economic and social fears he has instilled among the white community in regards to immigrants. I will be utilizing the Chapman Fear Survey in addition to the ANES 2020 data sets to extract data for my research and shed light on the importance of this topic.

**20. *Ethnicity or Party Identification? Which Plays a Bigger Role in the Fear of White no Longer Being the Majority?***

**Presenter(s):** Kassandra Gomez Orozco

**Advisor(s):** Dr. Ann Gordon

The 2014 National Projections report was based on the 2010 Census and estimates through 2013. The finding of these studies predict that by 2044, more than half of the American population will belong to a minority. The idea of whites no longer being the majority may be alarming to some people, as it has always been the norm of the country. This perceived threat of demographic change may be an indicator voters voting out of fear, and voting for candidates that cater to that fear. This paper will attempt to look at whether ethnicity or party identification have more relationship with the fear of whites no longer being the majority. I will examine if this fear is also present among minorities and how it may possibly play into voting behaviors. Research indicates that party affiliation is more closely related to the fear of whites no longer being the majority in the U.S than ethnicity.

**21. *The Fear Behind Illegal Immigration***

**Presenter(s):** Sofia Sanchez

**Advisor(s):** Dr. Ann Gordon

Illegal immigration has continuously been a hot topic, and the American population has obsessed over what measures should be taken with these people, if any. In a qualitative study, the fear of illegal immigration is going to be analyzed based on various independent variables such as ideology, party identification, and media, based on results from the Fear 2020 survey. The Chapman Survey of American Fear began in 2018, analyzing people's different fears nationwide, and how those might be related to other characteristics. Previous research analyzes attitudes towards illegal immigration; however the fear component will be a new addition to this topic. While illegal immigration has been studied for decades, most of these studies seem to be outdated, through this data we will be able to see effects of more recent events such as Trump's presidency and framing of the media. Among the interesting findings is the importance of framing of media and how that directly translates to who will be the "face" of illegal immigration, usually leading to a negative stereotype. While we head into a new presidential election, I want to take a look at the affects these variables have on individuals fear, and how this plays out in policy, allowing us to make possible predictions following these trends. This paper concludes with a discussion of the implications of the study of the fear of illegal immigration.

## **Psychology**

**22. *Psilocybin Microdosing in Healthy Volunteers: Comparative Effects on Sleep, Brain Activity, Psychosocial, and Cognitive Functioning***

**Presenter(s):** Emma Chen, Emma Krivoshein, Alice Wong

**Advisor(s):** Dr. Amir Raz

Microdosing in the context of psychedelic drug use refers to the frequent use of low doses of psychedelics for an extended period of time while the user goes about their daily life. Interest in microdosing has gained momentum in recent years, with ‘microdosers’ reporting a myriad of anecdotal benefits such as enhanced mood, cognition, empathy, and cordiality when working with others. Recent research has found that a single full-dose of a psychedelic can produce long-lasting positive change in behavior, personality and well-being. However, no peer-reviewed scientific reports have yet been published about the safety and efficacy of microdosing specifically with psilocybin (the psychoactive ingredient commonly found in psilocybin cubensis and other psilocybin-containing mushroom species, commonly referred to as “shrooms”). Thus, our study’s main objective is to investigate the effects of microdoses of psilocybin on various measures of human functioning, including sleep architecture, psychosocial, and cognitive functioning. By using a combination of electroencephalography (EEG), cognitive tasks, economic gameplay, subjective reports, virtual reality, and psychophysical experiments, the effects of psilocybin microdosing will be determined collectively through such measures. This study also seeks to examine the influence of expectation on the user’s experienced effects from psilocybin microdosing by incorporating the use of placebos.

**23. *Parental Relationships and the Offset of the Genetic Risk for Depression***

**Presenter(s):** Gia Roberts

**Advisor(s):** Dr. Jennifer Robinette

Worldwide, depression is a leading cause of disability. Numerous factors such as genetic background and features of the environment may be associated with depression. Despite the wide-ranging factors that increase risk, there are also protective factors, for example, positive parental relationships in childhood, which can lower the risk of depression in adulthood. The Health and Retirement Study (HRS), a longitudinal panel study, was utilized to collect data. It is a nationally representative sample of adults aged 51 and over in The United States (n = 20,000). The 2010 and 2012 waves of data were used to include information about retrospective parental relationship quality. The current study used a weighted linear regression to test the hypothesis that retrospective reports of parental relationships in early childhood serve as a protective factor, offsetting genetic risk for depression. The current study assessed depressive symptoms using the CESD Scale of Depression. Genetic risk was assessed with the polygenic risk score for depressive symptoms, a summary measure that quantifies genotypes for depression carried by each individual. Results of a weighted linear regression indicate that greater genetic risk and poorer quality relationships with parents early in life were associated with self-reporting more depressive symptoms, adjusting for age, sex, socioeconomic status (i.e. household wealth), and self-rated health. However, there was no significant interaction between the quality of parental relationships as a resiliency factor to the genetic risk for depression. Future research will expand the scope of social relationships to include spouses, friends, and other family members to determine whether these social network members may play a key role in offsetting genetic risk for this major public health concern.



**24. *Have Positive Supportive Relationships During COVID-19 Impacted Destructive Eating Behaviors?***

**Presenter(s):** Abigail Paine

**Advisor(s):** Dr. Julia Boehm

As a result of the COVID-19 pandemic, students across the country were sent home and underwent isolated precautionary measures. While much of the existing research includes data on how the pandemic has negatively impacted mental health, there is a gap in its effects on physical health. Therefore, I hypothesized that people with more positive supportive relationships during the COVID-19 pandemic, would engage in less destructive eating behaviors. In May 2020, 292 undergraduate and graduate students from Chapman University completed an online survey. The survey assessed factors of health, psychological conditions, academic experiences, housing situation, and financial situation. The Multidimensional Scale of Perceived Social Support (MSPSS) was used to assess positive supportive relationships and the sub-categories of family, friends, and a significant other. This data was then compared to the same participants' engagement in destructive eating behaviors measured by self-reported consumption of junk food, eating due to stress, and overeating beyond their normal behaviors. Contrary to the original hypothesis, a linear regression analysis showed no relationship between supportive relationships and destructive eating ( $b = -0.03$ , 95% confidence interval  $[-0.14, 0.08]$ ,  $p = 0.63$ ). Factors such as the small sample size and the secure financial status that is unique to many Chapman students are thought to have played a role in these findings.

**25. *The Association Between State Optimism and Academic Performance During COVID-19***

**Presenter(s):** Amber Rahim

**Advisor(s):** Dr. Julia Boehm

Research studies have been conducted on the correlation between optimism and grade point average (GPA) and found that hope, not (dispositional) optimism is related to GPA. However, no research has been conducted looking specifically at the relationship between state optimism and its relation to GPA. While dispositional optimism measures general positive expectancies, state optimism measures expectancies that can change based on the situation. Because state optimism takes into account contextual factors, it may be a more sensitive measure of optimism, especially during the COVID-19 pandemic when the environment is rapidly changing. A person's optimism at a certain point in time may affect their motivation to study or attend classes, which has the potential to have an impact on GPA. The purpose of the present study is to explore the relationship between state optimism, assessed specifically during the early months of the COVID-19 pandemic, and GPA in college students. It was hypothesized that higher levels of state optimism would be associated with better academic achievement (as assessed by GPA). An online survey was administered to both undergraduate and graduate students ( $N = 292$ ) assessing their health, psychosocial factors, academic experiences, housing situations, and financial situations. Participants completed the survey in May 2020 during the COVID-19 pandemic. The specific measure under investigation was the State Optimism Measure (SOM), which consists of seven items that were averaged together. Higher scores indicated more optimism. A simple linear regression model was conducted to assess whether optimism predicted GPA, but found no significant relationship between higher state optimism and an increase in GPA [ $B = -0.04$ , 95% C.I.  $(-0.07, 0.007)$ ,  $p = 0.11$ ]. Despite null findings, future studies could address state optimism in relation to academic performance given the lack of current research on the role of state optimism.

**26. *Pre-Mortem Diagnosis Of CTE in Football Players Using Various Diagnosis Tools***

**Presenter(s):** Joanna Spyrou

**Advisor(s):** Dr. Michelle Cleary

Chronic traumatic encephalopathy (CTE) occurs in individuals who have experienced traumatic brain injuries (TBI) and is behaviorally manifested by changes in personality/mood (depression, apathy, suicidality), cognition, and movement. Neurological changes resulting from TBI have been identified in American football players later in life. The purpose of this project was to identify a tool that is predictive of CTE and allows for proper treatment and management of recovery for athletes with multiple TBIs. A few studies have focused on pre-mortem brain imaging techniques that give clues as to whether an American football player will develop such complications due to their history of CTE. Also, moderate evidence suggests that flortaucipir positron emission tomography (PET) scans are accurate diagnostic tools even before the players start to exhibit cognitive impairments. High resolution brain PET scans can be used to reveal white matter integrity, regional volumes, and neuropsychological performance. In addition, studies have demonstrated changes in brain structure where phosphorylation is shown by red deposits and worsens as the stages of CTE progress. Neuroimaging techniques such as PET scans have shown promise as early diagnostic tools as they show a correlation between white matter integrity and neuropsychological performance. Flortaucipir PET scans are also to measure amyloid beta plaque depositions, important in the detection of Alzheimer disease. Translocator protein 18 kDa (TSPO) is also a proposed biomarker for brain injury and repair that can be measured using PET scans in vivo. Similarities in results of white matter abnormalities were shown in American NFL players with cognitive impairments suggesting that flortaucipir PET will be a powerful diagnostic tool with further research.

**27. *The Interplay Between Negative Emotions: Links Between Anger Control, Anxiety and Stress***

**Presenter(s):** Clarissa Tadros, Brianna Dinn, Natalie Standridge

**Advisor(s):** Dr. Tara Gruenewald

Humans experience a vast array of emotions, from excitement to fury to apprehension. These feelings affect many aspects of our lives, often without us realizing. Previous research on the effects of anger expression, in particular, has provided support for both negative and positive outcomes, including impacts on mental and physical health, efficacy in professional domains, academic performance, perceptions of control and trust, and other domains of psychosocial well-being. Pre-existing studies have supported a relationship between poor anger control and decreased well-being, with most studies focusing on feelings of depression. The aim of the current study is to contribute to our understanding of the role of anger expression control in emotional well-being by analyzing how one's level of anger control relates to other emotions such as stress and anxiety. Analyses will utilize data from the Biomarker Substudy of the second wave of the Study of Midlife in the U.S. (MIDUS), a sample of 1,255 adults from across the U.S. It is hypothesized that lower anger control will be associated with higher levels of social anxiety symptoms and perceived stress due to worry about possible negative perceptions and reactions from others in response to the angry outbursts. Further, these effects are predicted to be found even among people who are not diagnosed with an emotional disorder. This study may aid professionals who work to improve clients' management and expression of emotions by contributing to their understanding of how negative emotions affect one another.

**28. *The Clever Hans: Pupillary Change After Decision Making Tasks***

**Presenter(s):** Gilana Pikover, Andy Liang, Kayla Ghodsi, Paola Portillo

**Advisor(s):** Dr. Uri Maoz, Dr. Amir Raz

Clever Hans, a horse in the late 1800s and early 1900s, was reported to be able to do basic arithmetic and perform other cognitive tasks. However, after extensive research, German biologists at the time, Oskar Pfungst and Carl Stumpf demonstrated that the horse was able to detect unconscious micro-movements that the person asking the question, and especially its trainer, would make. Hence, only if the person asking the question knew the answer to the question and the horse could see the person, the horse could tap his hoof enough times to count towards the correct answer. The Clever Hans phenomenon highlighted the existence of subtle, unconscious cues for communication. It also served to highlight the importance of double-blind studies. The proposed study consists of two stages. During the first stage, the Clever Hans phenomenon will be recreated. Subjects will be asked a basic arithmetic question, and then hear taps that the subject counts until it reaches the correct answer. The questions are addition and subtraction, with answers ranging from one to ten. Pupillometry is used to track the subject's pupillary change during this process, looking specifically at pupillary changes that suggest anticipation and tension towards the answer, and then the ease of that tension. The experimental process uses no visual information, except a fixation point for subjects to look into, to reduce the risk of pupillary change due to external stimuli. In the second stage, this pupillary data will be used to train a machine learning program that will learn to identify the subtle, involuntary, pupil movements that are unconscious to the subject. By only looking at pupil dilation data, the program will be able to determine the answer to a math question that the participant is thinking about, using the same process from the first part of the study without the program having any previous knowledge of the answer to the question asked.

## **Theatre**

**29. *Soundscaping the Virtual Stage: A Film-Sound Design Approach to a Remote Production of In the Next Room***

**Presenter(s):** Nathan Reynoso

**Advisor(s):** Dr. Jocelyn L. Buckner

In the wake of the COVID-19 pandemic, theatres across the globe have closed their doors and migrated to online streaming platforms, such as Zoom, YouTube, and Facebook Live, to "broadcast" their productions to theatregoers at home. Though theatrical artists have been quick to embrace this stage-to-screen adaptation, many have been hesitant to apply the methodologies and aesthetics used in the rival storytelling medium of film. As a result, audiences have seen theatre produce rudimentary cinematography, including but not limited to shaky cameras, lacklustre backgrounds, and low audio levels. But, as theatrical artists continue to see an uncertain future ahead, can this divide between theatre and film last? What tools or techniques can theatre learn from film to produce plays during the pandemic? And can theatre still be theatre on a screen? This paper will examine how a film-sound design approach is inevitable for the success of a remote theatre production as opposed to live sound. As I interview sound artists and explore cinematic techniques, I will demonstrate how my sound design for Chapman University's Department of Theatre's production of *In the Next Room*, or the *Vibrator Play* exemplifies the properties of film sound and why this approach is critical to the efficiency of the production process, as well as the audiences' engagement and immersion into the world of the play on a screen.

## **World Languages and Cultures**

### **30. *The Virgin Mary and Niño Fidencio: A Literary and Cultural Comparison***

**Presenter(s):** Emily Schahrer

**Advisor(s):** Polly Hodge

Famous historical and literary figures who display characteristics of empathy, wisdom, and compassion inspire a great sense of faith in humanity and hope for the future. There are two exemplary figures explored in this study that embody these characteristics. The first is the Virgin Mary, a saint widely known and recognized by the Catholic Church since the 4th century. The other is Niño Fidencio: a famous healer, man of God, nicknamed a “saint of the people” from Espinazo, Mexico who lived in the 20th century. Although Niño Fidencio is not officially recognized by the Catholic Church, he names the source of his power as God and is a faithful follower of Catholicism. In King Alfonso X’s famous collection of poetic canticles from the Middle Ages in Spain, *Cantigas de Santa María* (Canticles of Saint Mary), the Virgin Mary is a key character who plays a role as the wise judge of humanity and also grants healing to those who deserve justice. Likewise, Niño Fidencio is considered a wise, religious figure who helps those in need. However, in the play, *El niño con el diamante en la cabeza* (The Boy with the Diamond on his Head) by award-winning Mexican playwright, Enrique Mijares, Niño Fidencio becomes a theatrical character whose role focuses on mediation between humanity and God and his strength as a healer of the people. This comparative study highlights the similarities and influence of these two revered figures who come from different time periods and different cultures. The Virgin Mary and Niño Fidencio promote social and religious unification, regardless of the official involvement of the Catholic Church. (This abstract is taken from the original Spanish into English, as the study is written completely in Spanish.)

**ROOM A**

**Biochemistry and Molecular Biology**

**10:30-10:50am**

***CowN: Mo-Nitrogenase's Guardian Against CO Inhibition***

**Presenter(s):** Max Strul, Kiersten Chong, Chloe Garcia, Terrence Lee, Ruchita Kharwa, Michelle Jin

**Advisor(s):** Dr. Cedric Owens

Fertilizer and more specifically ammonia production is an extremely critical aspect of modern agriculture given the high demands of crop production. These high demands require a greater need for fertilizer, but this comes at a cost: a lot of energy and pollution. The industry standard Haber-Bosch procedure of ammonia production requires extreme pressures and temperatures, making it unsustainable in the long term, especially given the rising needs. Alternative methods of ammonia production include bio-synthesis. The enzyme Mo-nitrogenase from *G. diazotrophicus* produces ammonia with minimal waste, only requiring ATP, hydrogen, and nitrogen. In order to make this enzyme a viable alternative, its efficiency must be maximized, including in environments with possible inhibitory conditions. A known inhibitor of the enzyme nitrogenase is Carbon Monoxide (CO). This inhibition renders the enzyme inactive, however, another protein, known as CowN, seems to protect against the inhibition of CO. This protein-protein interaction is one that is unknown, so our lab aims to characterize the interactions between these two proteins in order to understand how to maximize the efficiency of the enzyme for its future use in the industry of ammonia production.

**Mathematics**

**10:50-11:10am**

***Road Map to Zeta and Theta***

**Presenter(s):** Natanael Alpay

**Advisor(s):** Dr. Ahmed Sebbar

Over the Student-Faculty Research course, we started by a review of the Fourier series, the Riemann-Lebesgue lemma, analytic and geometric approaches, which needs some complementary reviews on functions theory, and integrals. For instance, different types of convergence of series of functions. We computed Gaussian integrals, different approaches have been used: Differential equations, residues theorem. We used Fourier series to derive The Poisson summation formula with application to the Gaussian functions, which leads us to the Theta function and its functional equation as a consequence of the Poisson summation formula. As results we study the numerical application of the Jacobi functional equation for a fast computation of the sum of some numerical series, and the solutions the heat equation.

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**ROOM B**

**English**

**10:30-10:50am**

***Rhetorical Consciousness: Chomsky & Foucault on Justice versus Power***

**Presenter(s):** Jacqueline Gilleland

**Advisor(s):** Dr. Jan Osborn

Lived realities are rhetorically constructed on the account that all human beings use symbol systems to perceive and communicate their “reality.” Rhetoric is fundamental to human consciousness, our symbol systems shaping and reflecting our world. Even arguments surrounding rhetorically constructed principles and ideologies are rhetorical in nature. This essay examines the relationship between symbol systems in use -language- and how lived realities are rhetorically constructed. Additionally, it examines how rhetoric takes ontological, axiological, and epistemic form, instrumental to the social construction of being, values, and knowledge. A theoretical framework based on Smith’s theory of Rhetorical Consciousness is used in this survey. The debate provides the text for analysis. The topic and questions in the debate are inherently rhetorical, Chomsky and Foucault’s discourse revealing their perceptions of self, values, and knowledge. This study reveals that “truth” is not universal or static. Furthermore, that rhetoric is a continual construction and evolution of “truth.” This paper contributes to research examining the relationship between human rhetorical consciousness and rhetorically constructed realities.

**10:50-11:10am**

***The Dialogic Power of Campaign Signage in 2020 Election Discourse***

**Presenter(s):** Lauren Bramlett

**Advisor(s):** Dr. Jan Osborn

This project examines how election signs are used in the 2020 Election Discourse. It focuses on campaign signs displayed in a Dallas, Texas neighborhood and analyzes the patterns of rhetorical interaction in the discourse. Campaign signage plays a central role in the communication of ideological power, acting as emblems of support used by both the Democratic and Republican parties. Mikhail Bakhtin’s theory of dialogism provides the methodology through which to view signage, revealing the inherent interactive nature of signs as they relate to other signs, to past discourses, to expected responses, and to widely shared conceptual horizons of viewers. Further, this study observes the significance of spatial positioning and aesthetic features as forms of rhetoric used to establish ideological power in 2020 Election Discourse. The multiple communication strategies of signage support a study of dimensionality in relation to rhetoric, emphasizing the impact of texts beyond oral/written language. Rather, power is conveyed through the contextualization and positioning of a text in time and space and viewing a text as isolated yields little meaning; language is constantly relating to what has been said and what is expected to be said. Thus, signage is dialogic; it communicates through its connection to other signs and utterances. These interactions imply that on a broader level, power in 2020 Election Discourse lies more in the ability of external information to influence understanding of a text than in the overt content of the text itself.

**ROOM C**

**Economics**

**10:30-10:50am**

***Measuring Culture and Understanding Cultural Change in the United States***

**Presenter(s):** Nicole Saito

**Advisor(s):** Dr. Erik Kimbrough

Westward migration played a crucial role in shaping the history of the United States, producing diverse, regionally differentiated patterns of social, economic, and political activity that persist to the present. One explanation for this regional variation is the “founder effect” – the idea that the settler colonists of a particular region exercised outsized influence in shaping its culture (see Fischer 1989, Woodard 2011). According to this theory, as migrants spread across the continent, they brought distinctive cultural toolkits with them, and because they were the earliest arrivals, they established the norms and institutions to which subsequent arrivals assimilated, and perpetuated. Cultural diversity may constitute a previously obscured source of friction influencing the equilibration of labor across culturally distinct regions. Scholars, accounting primarily for economic costs and benefits, assert that expected internal migration is greater than actual migration, concluding there are resultant labor market inefficiencies from differing rates of unemployment across regions. However, the matching process underlying migration may depend on both economic and sociocultural factors, and the apparent 'inefficiencies' observed may instead reflect an equilibrium that accounts for both economic and cultural costs. This project tests whether regional cultural distance (measured by the similarity of naming practices at the county level) significantly influences internal migration above and beyond the economic factors typically studied, on the basic assumption that a migrant’s choice of destination is influenced by cultural similarity to the individual’s place of origin. Our measures of cultural similarity and migration are constructed from the complete count U.S. Census from 1850-1870 and historical Social Security records of common names in the U.S. The data are analyzed for all states within the union prior to 1820. We find evidence supporting the view that cultural distance is an important source of friction reducing internal migration in the early U.S.

**Interdisciplinary**

**10:50-11:10am**

***Cognitive Diversity in Teams***

**Presenter(s):** Coury Hawks, Tanshi Mohan

**Advisor(s):** Dr. Keith Hankins

Do teams characterized by cognitive diversity still outperform homogeneous teams when we account for the ways that diversity can lead to miscommunication and conflict? Our research uses formal modeling, computational simulations, and human subject experiments to explore cognitive diversity effects in teams. We based our study on Hong and Pages's "Diversity Trumps ability" study, which found that a homogenous group or a group that had similar ways of approaching a problem would be outperformed by a cognitively diverse group; or one that had different ways of thinking and approaching a problem. With Dr. Keith Hankins, we worked to extend the Hong and Page model to account for the possibility that

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diversity is sometimes associated with miscommunication and conflict. Dr. Hankins had previously built a computational model to explore these dynamics. We sought to translate that model into an experimental setting to analyze the problem with real human subjects. Our experiment will further integrate human behavior into Hong and Page's computational model by introducing these costs by creating consistent discrepancies between participants' heuristics; for example, we can insert artificial miscommunication by making a participant's heuristic off by some set number. In later stages, we hope that participants will conduct the search on the map themselves, in groups, instead of the program running their choice(s) of heuristics and immediately determining the group's location. We expect that introducing communication costs qualifies the support that the Hong and Page model (and other work like it) provides to diversify teams. In particular, our research highlights the importance of accounting for how teams work together. We hope that our experiments will help identify some of the miscommunication sources in groups and how some groups manage to mitigate the costs associated with it.

**11:10-11:30am**

***On the Social Model's Rhetorical Dissonance: Remediating the Disabled Embodiment of Non-Apparent Chronic Illnesses***

**Presenter(s):** Taylor Hein

**Advisor(s):** Morgan Read-Davidson, Dr. Justine Van Meter

Historically, the social model of disability afforded the disability rights movement monumental sociopolitical and legislative progress. It was developed in response to the medical model, which reinforced the notion that disability is a bio-medical problem intrinsic to the impaired body that is broken and abnormal, in need of being cured, fixed, or corrected. Thus, the social model was revolutionary in creating a framework for understanding disability as a problem with society and not the individual, wherein people are disabled by physical and attitudinal barriers rather than by their impairment or illness. This project interrogates the ideological implications of such a conceptualization of disability which excludes the experience of disabled embodiment from the disability identity, such as the effects of chronic pain and fatigue on one's body and mind. I argue that the social model's dominance in scholarship and activism perpetuates an exclusionary paradigm of disability, the rhetorical effect of which marginalizes those with non-apparent chronic illnesses and their experiences of illness and impairment. Using critical disability studies, I demonstrate how the social model causes people with non-apparent chronic illnesses to question the validity of their citizenship in the disability community, refraining from claiming the identity because they do not believe themselves to be "disabled enough" or that they do not qualify as disabled if they have not experienced the specific inaccessibility and social discrimination outlined by the social model. Thus, the goal of this project is to remediate prior scholarship and activism and enter into the discourse of remedy and redress. I will set the agenda for a new integrative model of disability intended to expand our ontological perception and epistemological understanding of disability, consequently promoting greater inclusivity and diversity in the disability community.



**ROOM D**

**News and Documentary**

**10:30-10:50am**

***Polarization and the US News Media***

**Presenter(s):** Jenna Perry

**Advisor(s):** Dr. Ann Gordon

Political polarization has exponentially surged in the United States within the past decade. Scholars are concerned about the negative impacts the ideological rhetoric present on the Internet. Social media alone cannot explain the polarization issue in the United States, as widespread use of the Internet began after the increase in polarization was already occurring. Thus, the degree to which the Internet and social media contributes to polarization is a debatable topic for many social scientists of the 21st century. Applications such as Instagram, Facebook, Twitter, Snapchat, and Tik Tok have become breeding grounds for highly politicized content, including the presence of disinformation. Application algorithms carefully monitor and record social media user's every click, like, or swipe, making it easy for companies to target voters on either side of the divide with specific content. This study will assess the degree in which social media usage contributes to a voter's strength of party identification, including a voter's tolerance for the opposing party. In addition, media platforms will be compared to one another in order to determine what types of platform is likely to be the most significant in polarizing voters. Data from the ANES 2020 survey will be used to study whether social media users are more likely to consider themselves a 'strong' Democrat or Republican and hold more extreme policy beliefs. Additionally, these results will be compared to data from the ANES 2016 survey, in order to study whether polarization has significantly progressed under the Trump administration.

**Political Science**

**10:50-11:10am**

***American Disaster Preparedness***

**Presenter(s):** Kaitlyn Kaplan

**Advisor(s):** Dr. Ann Gordon

The Chapman Survey of American Fears is utilized to study Americans' perceived "readiness" for an oncoming disaster. There is a specific focus on the question "Do you think you are as ready for disasters as other people in your community" to analyze how demographic information correlates with this question. Existing literature and information regarding the American fear of disaster and how the American family copes with disaster is considered. It has been hypothesized Americans with children often feel more prepared for disaster because they have more involvement within their society. Research of past American disaster response and the publicized disaster relief programs available through various institutions such as the Federal Emergency Management Agency were important to review before analysis was conducted. Previous instances in which families have had to prepare for massive disasters, such as Hurricane Katrina, are accounted for and compared to the experiences of those who live alone. Such research allows analysis to understand if there is a correlation between family size and disaster response and will suitably prove if families are better prepared for disasters than solitary individuals. These findings

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will be helpful for nonprofit institutions that seek to amplify American preparedness as there will be clarity as to how family size can impact perceived levels of preparedness.

**11:10-11:30am**

#### ***Measuring If Fear of Climate Change Promotes Increased Emergency Preparedness***

**Presenter(s):** Alya Hijazi

**Advisor(s):** Dr. Ann Gordon

The objective of this research paper is to discover if fear of climate change contributes to emergency preparedness by using data from the Chapman University Survey on American Fears. It gauges how well Americans respond to the factors that contribute to climate change, if at all, by using variables and categories from the methodology report. This paper addresses the importance of climate change, while noting its emergence and popularity in recent history and politics. Past literature addressed concerns about climate change from specific demographic groups such as age, education, and political party affiliation, and it also looked at climate change denial as a base factor. Previous contributions to the field have studied demographic groups' responses to emergencies presented by climate change-related factors, but none have linked the rising threat of climate change to emergency preparedness as a whole. The paper finds that fear of climate change does not necessarily correlate to emergency preparedness. A conclusion that can be drawn is that there are varying levels of concern about climate change, but people believe they are as prepared as others they know for emergencies whether they are afraid of climate change or not. This project can persuade others to prepare for climate change-related emergencies, and it provides useful information for those in the scientific, political, and nonprofit fields.

## **ROOM E**

### **Political Science**

**10:30-10:50am**

#### ***Examining the Preferences and Attitudes Towards the Federal Budget***

**Presenter(s):** Davinder Ghotra

**Advisor(s):** Dr. Ann Gordon

This research examined the relationship between the United States Federal budget and its citizens. It will determine the attitudes toward government spending, including the preferences and in relation to how citizens will vote in current and later elections. The federal budget is something that affects all of us, and it is noteworthy how voters will vote based on the things in the budget vital to them. They're also concerns that will be addressed concerning the budget deficits that are increasing every day. The main reasons that would include the high rise of deficits in the United States are excessive misuse printing of dollars, not spending within our means and poor economic policies that have led to widespread misuse of the budget by politicians. Within the years of increasing, there has been a distrust of the United States government over this issue, and the public opinion upon voters shows that there is real concern over the future of this country and what the government spends on. The data set used for this research is the ANES Pilot 2016 at Chapman University. Key variables we will be looking at are with the national deficit, government

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spending and preferences, and the priorities of the government in the economy towards minorities. Upon analyzing the results, citizens of the United States want increased spending of government in the federal budget and want the government to do more for society, especially minorities.

#### **10:50-11:10am**

##### ***For Many Americans, "To Protect and Serve" Is Nothing More Than a Motto***

**Presenter(s):** Devin Lopez

**Advisor(s):** Dr. Ann Gordon

Amidst recent national debate over the role of force in police departments throughout the United States, as well as the growing Black Lives Matter movement, many Americans have voiced their fears of becoming the victim of police brutality. This report, utilizing the Chapman Survey on American Fears, will assess the relationships that the individual traits of race, income, and news consumption habits have over an individual's level of fear of being the victim of police brutality. Testing for race, it is expected that Blacks hold a higher fear of police brutality, a sentiment that is supported in the Critical Race Theory which takes into account the historical oppression that the Black community has faced and the impact that it leaves in modern society. With regards to income, the literature around Conflict Theory suggests that police departments exist to protect property rights and prevent low-income earners from impeding on the rights of the upper class. It was found that those with a high income level are very likely to have no fear of police brutality. A similar crosstab illustrates this correlation, with fear levels of police brutality decreasing as individuals' income increases. Lastly, the social construction of reality theory asserts that we as a society create our own versions of reality based upon who and what we socialize with. In this case, it is expected that those who consume news through social media regularly are more likely to have a higher level of fear than those that consume print and cable news due to the "viral" nature of social media. Interestingly, Fox News and Talk Radio are the only forms of news in which those who never tune in are more likely to have a higher fear of police brutality.

#### **11:10am-11:30am**

##### ***Public Trust in Science***

**Presenter(s):** Maggie Swett

**Advisor(s):** Dr. Ann Gordon

The goal of my research paper is to explore public trust and perception of science in the United States and how it has become more polarized over the years. Science plays a major role in society and has many functions. This paper will explain why people choose to either trust the science presented to them or distrust science. I will examine why different groups in America perceive science in different ways and how this affects people's views on topics such as climate change, pandemics, and vaccines, and what the source of this polarization is. The answer to these questions will be found in people's political ideology, religious preference, race, and geographical demographic. The data for this research was obtained from the American National Election Studies 2020 Codebook.

**ROOM F**

**Political Science**

**10:30-10:50am**

***Terrorism in the United States: Social Factors that Influence Fear***

**Presenter(s):** Ryan Trask

**Advisor(s):** Dr. Ann Gordon

This research paper will examine how the United States and its citizens respond and feel with regards to terrorist attacks using the Chapman Survey of American Fears, a nationally representative survey of the United States. The central questions that will be examined are how afraid the United States population is of a terrorist attack and how afraid they are of Islamic Extremists and Jihadists threatening their national security. The media focuses on violence and fear since it draws the greatest audience. Because this is the case, does an uncensored media heighten fear and influence the policies of national security? This research paper will also examine the fear of terrorism in regional areas of the United States. Do individuals living in the Northeastern region of the United States fear terrorism, Islamic Extremists, and Jihadists more because of the past traumatic attack of 9/11 on the World Trade Center in New York? Age will also be examined to provide evidence of whether an older population fears terrorism more due to their past experiences. It is crucial that the American government understands the probability of the United States being a terrorist hot spot and understand its citizens level of fear on terrorism and who they fear will carry out these attacks. Creating proficient counterterrorist policies will require bipartisan cooperation. This paper will also examine how political affiliation influences fear of terrorism. This research and findings are crucial to society because if there is a better understanding on how the media affects fear of terrorism, the levels of fear in different United States regions, and how an individual's age correlates with fear of terrorism, a concrete bipartisan counterterrorist policy can be made to lessen fear and increase safety in the United States.

**10:50-11:10am**

***An Analysis on How the Economy Impacts Voter Choice***

**Presenter(s):** Isabella Morrow

**Advisor(s):** Dr. Ann Gordon

Recognizing the reasoning behind voter choice can help predict election results, and consequently, have a long-lasting effect on the country. The phenomena of public perception of the national economy appears to hold a significant influence over the public's decision at the polls. An important question that must be considered is, can the state of the economy really change the way the public turns out to vote? Thus, my area of concern is how voter choice is impacted by public perceptions of the national economy. In addition, this paper will analyze if voter choice is impacted differently during midterm elections and the general election. These questions will be answered by utilizing the 2020 and 2018 American National Election Study data in SPSS. Key dependent variables include voter choice in the midterm and general elections, while independent variables include public perception of the national economy and the current perception of voters' financial situations. Among interesting findings, the economy plays a pivotal role in presidential elections, but not as significant of a role in congressional elections. This paper's findings suggest economic voting to be very influential during presidential elections with no incumbent running

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for reelection. In addition, the relationship between economic self-interests and political attitudes are significant, especially when voters are experiencing unemployment or a worsening financial situation. Understanding voter choice is extremely significant because of its effect on the political landscape of the country. Voter choice encompasses America's democratic values and gives the public a sense of influence over the country's government. Further, these findings are significant in determining why people vote, but only represent a small part of our understanding of voter choice.

**11:10-11:30am**

#### ***Do Polarizing Views on Abortion Determine Election Outcomes? The Effects and Impacts of Single-Issue Voting Behavior***

**Presenter(s):** Katlyn Barbaccia

**Advisor(s):** Dr. Ann Gordon

Though the right to have an abortion is protected under the Constitution and has been since the 1973 Roe v. Wade Supreme Court ruling, it continues to be a popular topic for debate today with various interpretations of the law creating extremely divided positions on the issue. For those who identify as pro-choice, its legalization was an important step forward for women's liberation; however, recent backlash against these gains by pro-lifers has caused regressive ideals about women's autonomy to resurface. The research's objective is to assess whether strong feelings about abortion rights affect voting behavior. Single-issue voters make voting choices based on whether a specific candidate aligns with their perspective on particular issues. The research intends to prove that these individuals will advocate for candidates who are committed to policies that advance their personal objectives. Utilizing data from the American National Election Studies 2020 Questionnaire, the research seeks to compare people's degree of investment in abortion rights to their voting behavior. The impact of single-issue voters on election outcomes is also discussed. Overall findings suggest that individuals who consider abortion as a very important issue are also inclined to exhibit extreme opinions regarding laws designed to regulate abortion rights. Correspondingly, the data indicates that individuals who do vote have much stronger opinions about abortion rights than those who do not vote. This implies that single-issue voters play a part in dictating public opinion as they further divide parties by encouraging them to support exclusively oppositional views. These findings contribute to how people understand single-issue voting behavior and also determine whether a woman's right to have an abortion is an issue that is polarizing enough to have this effect.

## **ROOM G**

### **Political Science**

**10:30-10:50am**

#### ***Hot or Not: Fluctuating Beliefs on Anthropogenic Climate Change***

**Presenter(s):** Audrey Hattori

**Advisor(s):** Dr. Ann Gordon

In past years, the pervasive issue of climate change has left staggering effects on the environment--from fires to droughts to flooding to blinding heat--and the American public. Concurrently, political polarization has been exacerbated by the election of President Trump in 2016. The amalgamation of the two has

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resulted in climate change to become a controversial and politicized issue at the forefront of the nation. But, that does not mean that every citizen is equally concerned about the matter. The issue seems to be split among party lines with left-leaning voters more concerned with anthropogenic climate change. According to the self-categorization theory, once a person places themselves in a category, a political party in this case, they exhibit beliefs and behaviors that reaffirm their label as a member of the aforementioned group, resulting in partisans to internalize the opinion of their respective party. This paper will utilize the ANES pre-2016 survey to determine the specific demographics--party identification, age, and parental status--that influence public perception on climate change. Then, using this data, the paper will delve into whether this hot-button issue pushes respondents to vote for greener candidates--specifically, in the 2016 presidential election. One interesting finding from this research suggests that the respondents' age actually has a greater influence on their stance on climate change than party identification, which is surprising due to the rampant political polarization that has been developing in the past decade. With the growing need for action on the pressing and existential threat of climate change, this research will identify what influences voter's beliefs and patterns--as the only way to achieve change in a democracy is through the public's vote. With this, climate change could potentially have a greater presence on the national and local level.

**10:50-11:10am**

***Infidelity Fears & Party Preference: Predicting the Impact of Infidelity Scandals in Politics***

**Presenter(s):** Marina Logue

**Advisor(s):** Dr. Ann Gordon

Though researchers often look at variables that influence the likelihood of a person's inclination towards infidelity, an area of research less frequently examined is that of the fear of infidelity even though perception and reality are not one and the same. For many voters, a candidate's relationship history is a deciding factor in whether to consider that person as sufficiently trustworthy to hold office and act in the best interests of constituents. Utilizing data from Chapman University's Survey of American Fears, I examine the impact that three variables have on a person's degree of fear that a partner will be unfaithful in a romantic relationship, distinguishing the actual act of cheating from a person's fear that the act will occur. These same variables—income, gender, and age—may also point to general unfounded jealousy, suspicion, and distrust and have previously been seen to indicate party preference, suggesting a potential correlation between party preference and the fear of infidelity. My prediction is that income and age will have a negative correlation with infidelity fears and that women will fear adultery from their partners more than men. As this looks at fearing infidelity rather than the actual presence of it in relationships, my conclusions can help determine what types of voters will be more affected by these types of scandals in politics from the entire population rather than looking at only those that have experience with or been exposed to infidelity. My initial supposition — based on my hypothesis regarding the effects of certain variables on infidelity fears — is that the opinions of Democrats rather than Republicans will be more negatively affected by adultery seen in American politics. The results of this paper may be used to predict the impact of infidelity scandals as well as the audience to which apologies and future campaigning should be directed after an infidelity scandal occurs.

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**11:10-11:30am**

#### ***Immigration Views and the Fear of Immigrants in the American Public***

**Presenter(s):** Victor Leon

**Advisor(s):** Dr. Ann Gordon

Immigration has been a hot topic of discussion and debate in the United States political world in the most recent decades. It is rare to find a person who doesn't have their own personal view and thoughts on the issue. In this article, I analyze and study the precepted fear the United States public has on the issue of immigration and the large influx of immigrants over the past couple of decades. This article will explore three different aspects of the immigration issue: the idea of cultural assimilation and racial groups, the perceived attitudes of American citizens towards immigrants, and the comparison between legal and illegal immigration. Using data from the Methodology Report on the Survey of American Fears from 2018, this article explains and explores how American citizens view immigration in today's world and possibly why is it an issue they fear. The reference of the United States as a "land of immigrants" is an idea that has shaped us as a nation ever since our first steps. Immigration itself has been a hot issue of debate throughout the history of our nation. I believe this issue should be studied from today's point of view in this polarizing political environment. Being a largely debated topic, certain aspects of immigration that could invoke fear in the American public have been discussed in past years. The economic aspect of immigration (Borjas, 2018) and the relationship between immigration and the welfare system (Grand, Xu, David, 2017) are a couple of facets of the immigration topic. This article in particular concentrates on the views of Americans toward immigration and whether these views are those of fear in the US public.

## **ROOM H**

### **Political Science**

**10:30-10:50am**

#### ***The Rise and Persistence of Islamophobia***

**Presenter(s):** Markos Buhler

**Advisor(s):** Dr. Ann Gordon

Since the terrorist attacks on September 11th, 2001, Islamophobia has exponentially grown as a key player in the political and social lives of residents in the United States. Muslim and Arab-Americans have been casted out to the fringes of society and are often treated as second class citizens. The popular culture in the U.S. reflects this trend of expanded Islamophobia as countless movies and television series often portray Muslims and Arabs as the antagonist, while scarcely featuring them as the protagonist. Islamophobia has not only made its' way onto the screen but has also found sentiment in the halls of state legislators and the White House. Politicians across the United States continue to push efforts to restrict the constitutional rights of Muslims as evident with the Oklahoma "Save our State Amendment" banning Sharia Law and with President Donald Trump running his administration as an anti-Muslim administration. It is important to note that although anti-Muslim sentiment has been prevalent across all major political affiliations, in more recent years Republicans continue to have the highest levels of discomfort with Muslims in the United States. Republican uneasiness ranges from the amount of extra screening in airports all the way to Mosques being built in communities. This paper will first discuss the rise of Islamophobia in the United States after the terrorist attacks on September 11th, 2001. I will discuss how

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Islamophobia was not created from 9/11 but was heightened due to it. Secondly, I will look into how Islamophobia has manifested itself into pop culture and more detrimentally into politics in the United States. Much care will be taken to look into the effects of how using Islamophobia as a political weapon attempts to turn countless numbers of Muslim and Arab residents in the United states into second class citizens.

**10:50-11:10am**

#### ***Fear of Crime V. Fear of Police Brutality***

**Presenter(s):** Lily Mallick

**Advisor(s):** Dr. Ann Gordon

Versions of vulnerability theory along with media trends have been used in an attempt to explain police brutality and its causes. Vulnerability theory has proven that there is an inherent fear of both crime and police brutality in almost all human beings. Studies have also proven that there is a direct correlation between social media consumption and the fear of crime. This paper will conduct a cross national analysis on the relationship between fear of crime and fear of police brutality. Data will mostly be obtained from the National Fears Survey, along with pieces from the American National Election studies and other scholarly works. When looking at fear of crime, the person's preferred media outlet ( Fox / CNN ) will be focused on, in an attempt to see how the media sways their opinions. When conducting frequencies and cross-tabs, I will be looking to see which groups of people fear violent and financial crime, which groups fear police brutality and which groups fear both. I expect to see a large disconnect between these fears in certain demographics. This paper will take a deeper look at fear of police brutality, and see whether it is inherent like fear of crime, or specific to certain demographics.

**11:10-11:30am**

#### ***American Fears Regarding COVID-19 and the Effect on the 2020 Presidential Election***

**Presenter(s):** Sophia Salstrom

**Advisor(s):** Dr. Ann Gordon

There is uncertainty and fear concerning the upcoming presidential election this November 2020. One of those fears is COVID-19, and how it will affect the outcome of the presidential election. This research will examine how American worries over COVID-19 predict individual support in favor or against mail-in-voting. The data for this research was primarily obtained from the American National Election Studies (ANES) survey as well as the Methodology Report: American Fears Survey. The sample size for the American National Election Studies Survey is not finalized. The Methodology Report: American Fears Survey is 1,190. Other factors that will be included in this research are the respondent's party identification, candidate support, fear of ballot fraud, and fear of low partisan turnout due to mail-in-voting. Also, the effect Generation-Z voters will have on the election due to growing social media influence will be analyzed and included. This research began in August of 2020 and will end in December of 2020. Hypothetically, if someone is concerned about COVID-19, they are more likely to be in favor of the usage on a large-scale mail-in-voting for the 2020 presidential election than someone who is not concerned about COVID-19.



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### ROOM J

#### History

**10:30-10:50am**

***Jose Carlos Mariategui & His Vision For Peruvian Socialism***

**Presenter(s):** Carla Frias

**Advisor(s):** Mateo Jarquin

Karl Marx's political ideals have long prevailed over time. Many political leaders and scholars from across the globe have placed faith on the German's economic and political philosophy, and his vision to create a better and more just world. Jose Carlos Mariátegui was one of his great supporters; As a Peruvian intellectual from the elite class, Mariátegui believed that the conditions of Peru and South America had been negatively affected after its colonization period in 1533. In response, he published a book in 1928 called *Seven Interpretive Essays of the Peruvian Reality* where he re-purposed the application of Marxism as a viable path that could help remediate the colonial trauma that Peru was still holding on to. Marategui believed that the "problem of the Indian" began when colonizers from the West replaced the Incan Empire with a capitalistic market that did not coincide with the agricultural indigenous culture. In this research paper, we will analyze why Jose Carlos Mariátegui urged to reconsider Marxism as a viable political theory that can help remediate the broken political and cultural system that Peru, and many other developing countries, are now living in. In this research paper, will de-tangle Mariategui's proposal for a socialist movement that was based on the idea of unity between the white, mestizo, indigenous and immigrant - so that together, they can intervene the force of history for a fair life. His book not only wanted to critique the capitalistic problem, but persuade a socialist solution by re-evaluating Peru's economics history.

#### Political Science

**10:50-11:10am**

***Fear of the Badge***

**Presenter(s):** Jessica Cardenas

**Advisor(s):** Dr. Ann Gordon

Police brutality has been a popular topic over the past few years due to the rise of social media, news outlets, and socio-political issues. According to the 2018 American Fears Survey, approximately 26.6 percent of Americans said they are "afraid" or "very afraid" of being a victim of police brutality. The American Fears Survey provides in-depth, quantitative data on people and their fear of police brutality as well as their party identification and what media outlets they follow. Media sources such as FOX news, CNN, and social media have a strong influence over their audiences' opinions and are able to illicit or suppress fear. Those who are more devoted to hearing the news everyday are more likely to be afraid of being a victim of police brutality. In addition, these media sources have particular target audiences and it is found that those who lean on the Democratic side of politics, are more likely to be afraid than Republicans. It is seen that party identification has the largest influence concerning fear of police brutality over media sources, race, income, and region. Members of a party promulgate confirmation bias by frequenting certain media outlets which influence their fear of being a victim of police brutality. Due to

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this media influence, the fear of police brutality has led to a greater split in society as party lines grow stronger, officers and civilians are being placed in more dangerous positions, and the next generation will have a negative impression of law enforcement.

**11:10-11:30am**

#### ***Political Party Identification and the Fear of Climate Change***

**Presenter(s):** Isabella Marcus

**Advisor(s):** Dr. Ann Gordon

This paper will conduct an analysis of the correlation between political party affiliation and its effect on the fear of climate change. Based on the Chapman University Survey of American Fears, global warming and climate change is listed among the top ten fears average Americans had in 2018. For decades, climate change has been a contentious issue in the United States and globally. Republicans and Democrats seem to have consistently been in disagreement regarding the issue and the policy surrounding it. Looking at the two main political parties, Democrats and Republicans, this study will be able to draw conclusions regarding their viewpoints. It will determine how political party affiliation and the two differing viewpoints affect the common fear that Americans have of climate change. This paper will conduct an analysis between political party identification, and additional factors including sources of media, gender, age, and income, religion, and education to determine how those factors coincide with public opinion of climate change. Multivariate regression results find that the political party affiliated with liberal points of view, Democrats, will correlate with a greater fear of climate change. On the contrary, individuals who side with the conservative point of view, Republicans, will have a lesser fear of climate change. The correlation between the additional variables and their impact on party identification as well as fear of climate change will be further elucidated in the duration of this paper.

## **Biochemistry and Molecular Biology**

### **1. *Purification of CYP8B1 for Novel Drug Screening to Treat Obesity /Diabetes***

**Presenter(s):** Alejandro Espinoza

**Advisor(s):** Dr. Cedric Owens

Obesity is a national health crisis in America. Obesity related conditions includes heart disease, high blood pressure and diabetes. Bariatric surgery is a modification of patient's gastrointestinal track to improve weight profile. Currently not much is known about how these surgeries improve weight profile however with ongoing research it has found that bariatric surgeries improve weight through possible pathways affecting lipid metabolism, and bile acid salt concentration. Vertical sleeve gastrectomy (VSG) is a type of bariatric surgery that modifies the stomach morphology leading to change in enzyme expression. Previous research in the lab showed the expression of lipid metabolism enzymes was altered. One major change was a decrease of CYP8B1, a monooxygenase that is the rate limiting step of conversion of cholesterol into cholic acid. Inhibition of CYP8B1 by a novel molecule could possibly lead to a similar weight profile to patients that underwent the invasive VSG surgery. The goal of this project was to develop a methodology that can be used to synthesize functional CYP8B1 for structural characterization by X-Ray Crystallography. Solving the protein structure will help develop novel inhibitors for CYP8B1. Our research group used restriction digest cloning, transformation, and expression techniques to isolate and amplify the CYP8B1 gene of interest. Synthesis of the CYP8B1 protein was difficult in vitro as the whole protein either misfolded or was insoluble. A solution was the creation of CYP8B1 truncations. Truncations were made by comparing the motifs of CYP8B1 protein to a similar CYP7A1 protein to make truncations around the protein's active site. Once all truncated protein was expressed one out a possible nine had a properly folded active site motif and had increase solubility due to an addition of a SUMO tag. Enzyme kinetics assay still needed to be performed to show that the truncation was a functional protein.

### **2. *Testing the Inhibitory Effect of the Diarylpentanoid CA27 in Breast Cancer Cells***

**Presenter(s):** Emily Schahrer

**Advisor(s):** Dr. Marco Bisoffi

Breast cancer is one of the most common cancers found in women around the world. It can be characterized by the overexpression of a protein known as the androgen receptor (AR). AR acts as a transcription factor for genes involved in cell growth and survival. In cancerous cells, AR signaling is constitutively active, leading to upregulated cell growth and proliferation. A specific subtype of breast cancer called triple-negative breast cancer (TNBC) lacks the expression of the estrogen receptor (ER), the progesterone receptor (PgR), and human epidermal growth factor 2 (HER2), making it challenging to treat with hormone therapies or targeted drugs. A synthetic analog of curcumin known as ca27 can downregulate AR expression and prevent AR signaling from taking place in cancerous cells. This study explores the ability of ca27 to downregulate the AR in breast cancer cells and further define its potential as a treatment. A TNBC cell line known as MDA-MB-231 and an ER+, PgR+, HER2- cell line known as MCF-7 were used in this project. Cells were treated in a dose-dependent manner to define which ca27 treatment concentration was most effective. The effect of ca27 on cell growth was tested using the WST assay and indicates that it is inhibitory in breast cancer cells. After treatment, protein lysates were obtained and separated by sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE). Western blotting analysis was used for the detection and analysis of AR expression. Initial results support the ability of ca27 to downregulate AR expression in breast cancers.

## **Biological Sciences**

### **3. *Locomotion of Atlantic Hagfish: Burrowing in Sand***

**Presenter(s):** Luke Arnold

**Advisor(s):** Dr. Douglas Fudge

Hagfishes are elongate, eel-shaped marine organisms notorious for their ability to produce large volumes of slime as a defense mechanism against predators. They are commonly found in the depths of the ocean, where they act as scavengers. Hagfishes have been known to squeeze through tight spaces and burrow in a variety of substrates, including sand, mud, and large animal carcasses, but the specific mechanisms of hagfish burrowing have not been widely researched. In this project, we studied the behaviors of the Atlantic hagfish (*Myxine glutinosa*) burrowing in sand. This was accomplished by observing an Atlantic hagfish in a tank partially filled with sand and artificial sea water (ASW), filming with a mounted camera. Videos were used for kinematic analysis of tailbeat frequency, instance and direction of body rotation, and behavioral patterns. It was found that Atlantic hagfish sand burrowing is a specialized behavior that occurs in two sequential phases: the first phase began with the hagfish entering the substrate head-first, followed by lateral tail beating that had an initial increase in frequency, followed by a gradual decrease and rotational movements of the body. This persisted until the hagfish was partially submerged in the sand; the second phase began with a gradual lurching where the body would enter the substrate in a saltatory pattern over a longer period of time. These findings are significant within the context of vertebrate evolution as well as bettering our understanding of the diversity of Atlantic hagfish locomotor behaviors. A biphasic burrowing strategy has also been noted in burrowing and sand diving Osteichthyes, indicating that the lack of a vertebral column and the presence of an elongate body form of hagfishes does not impede, and may even functionally enhance, the burrowing lifestyle of myxinids.

### **4. *Are Pacific Hagfish Reactive to Light Stimuli?***

**Presenter(s):** Dahlya Habashi

**Advisor(s):** Dr. Douglas Fudge

Hagfishes are marine craniates that burrow into the ocean floor. Hagfishes do not have functional eyes, instead, they have unpigmented eye spots located on the top of their head. As such, hagfishes perceive light through a dermal light sense, using photoreceptors located within the eye, under the skin. Upon opening the holding tanks, and introducing light into the tank, Pacific hagfish (*Eptatretus stoutii*) appear to alter their behavior and begin moving when initially still. This observation led us to question if Pacific hagfish were sensitive towards light. Although light studies have been conducted on other species of hagfish, not much is known about the light sensitivity of Pacific hagfish. If this hypothesis was true, we predicted that Pacific hagfish would be disturbed and alter their behavior when introduced to a light stimulus. To test this, an LED light was fixed to the top of the tank to illuminate the tank during the trials. Using a GoPro to record Pacific hagfish movement during the 15-minute trials. Pacific hagfish were allowed a 15-minute adjustment period in the dark after the tank apparatus was set up, before being exposed. Using video analysis, movements of the hagfish could be quantified immediately after the light stimulus was introduced in the tank. In analyzing the footage, five distinct movements were identified throughout the duration of the trial. In response to bright light, Pacific hagfish first appear to coil tightly, then begin to move their tail and head, which can also lead into more active swimming behaviors. Our preliminary results suggest hagfish are, indeed, photosensitive. Further, the coiling behavior observed during the trials appeared when initially introduced to light and again when bumped by another hagfish.

This leads us to believe that the coiling behavior may serve as a startle response, occurring when a hagfish is disturbed rather than a light specific behavior. Our results raise interesting questions about the role of photosensitivity in deep sea animals and the diversity of photosensitivity within the hagfish lineage.

**5. *Locomotion of Atlantic Hagfish: Burrowing in Marine Mud***

**Presenter(s):** Keolani Kahale-Lua

**Advisor(s):** Dr. Douglas Fudge

Hagfishes are elongate craniates that live on the ocean floor and are known for their use of slime as a defense mechanism and their evasive nature. Their unique locomotive behaviors have been characterized by anguilliform swimming, contortions like knotting, and expert burrowing in complex environments and confined spaces like carcasses. In doing so, they are able to scavenge and avoid predation with ease. However, little is known about the mechanisms by which hagfishes achieve such burrowing efficiency. In this study, we analyze and propose behavioral mechanisms by which Atlantic hagfish (*Myxine glutinosa*) burrow into gelatin to understand how they navigate in marine mud sediments. Specifically, videos of the hagfishes burrowing were collected and quantified by frequency and amplitude of tail beats over time. Our results suggest that hagfishes use a methodical, biphasic approach for burrowing into substrate. A key behavioral pattern observed was an initially high tail-beat frequency and head wagging, which devolved into body-axis propagation with smaller undulatory frequencies until the animal had completely submerged. Our research coincides with previous literature on the evolution of locomotion in long-bodied aquatic animals and suggests that the biphasic mechanism they employ functionally enhances their burrowing lifestyle. Future experiments are expected to yield kinematic models for these locomotive patterns of myxinids and further insight into the diversity of hagfish locomotion.

**6. *Skein Scaling in Hagfish***

**Presenter(s):** Kristen Nieders

**Advisor(s):** Dr. Douglas Fudge, Dr. Yu Zeng

Hagfish are benthic scavengers that produce slime as a defense mechanism against predators by clogging their gills. The unique properties of this slime are mainly attributed to the silk-like threads produced by cells in the slime gland. These threads are coiled and stored in ellipsoid shaped “skeins” that reside in gland thread cells. Since the function of a skein is to be ejected from the hagfish, it has been hypothesized that size of skeins is not conserved across organisms as evolutionary and biophysical constraints may not apply to cells ejected from the body. Additional studies have found that the average skein is smaller in glands that are in the process of refilling with less mature skeins than in full glands with mature skeins. To better understand this evident variation of skein sizes in hagfish we investigated how thread diameter varies with skein size by measuring the thread diameter and skein length. Our results have shown that as skein size increased, the thread diameter increased as well in a positive linear fashion. There have also been positive correlations revealing skein size as measured by the length of the skein correlates with body size. This investigation is important in understanding the function of this biomaterial produced in the skeins, as the relative shape of skeins is conserved across different body sizes however skein size appears to vary.

**7. *Dietary Ganglioside Improves Disease Activity Index in Pediatric IBD***

**Presenter(s):** Alyssa Levien

**Advisor(s):** Dr. John Miklavcic

Inflammatory bowel disease is characterized by chronic inflammation of the gastrointestinal tract and can be recognized as either ulcerative colitis or Crohn's disease. This disease greatly affects the quality of life in many pediatric patients differently from adults, more specifically causing growth stunting, abnormal or delayed development, and can cause more severe nutrient deficiencies. The overall goal of the 10 week randomized, double-blind controlled intervention is to focus on the physiological effects of dietary gangliosides found in buttermilk powder and aim for an improvement of the disease activity index represented by a changing of category (ie. Severe to moderate). Secondary goals include improvement in ImproveCareNow Physician Global Assessment (ICN PGA) category, intestinal permeability, fecal calprotectin, and C-reactive protein (CRP) inflammation levels are crucial for these pediatric-aged children and are the main interest in this study. This clinical research trial will recruit 48 participants, aged 9-21 years old from Children's Hospital Orange County throughout a 12 month period. Inclusion criteria includes: participants with moderate disease activity, location specific IBD (ileocecal). Exclusion criteria: cannot be pregnant or have had a bowel resection. Participants, upon consenting, will be enrolled in a 10-week trial period where they will be randomly given either the treatment or the placebo. The treatment is given as 5 grams of buttermilk powder per day and the placebo group will be given an anhydrous milk fat complex. Throughout the study at specified times blood tests, stool and urine samples, adverse event indication forms and quality of life surveys will be given out. The overall effectiveness of the treatment will be assessed throughout the study with a focus on disease activity, intestinal permeability, calprotectin levels, and quality of life. The treatment group is expected to have improved quality of life, fecal calprotectin levels, and intestinal integrity and decreased CRP and calprotectin levels after 10 weeks.

## **Business**

**8. *Social Media Engagement for Global Eco-Influencers***

**Presenter(s):** Khushi Patel

**Advisor(s):** Dr. Kara Bentley, Dr. Charlene Chu Dr. Cristina Nistor

Consumers use social media to create content, generate online word-of-mouth, communicate with brands and other consumers across a global marketplace. Influencers have a truly global reach across the world. Their followers choose to engage with influencers who deliver content that is timely and interesting. However, there is little research on international aspects of social media, such as country of origin effects or variety seeking behavior across countries. Our project seeks to analyze the forces that drive consumer engagement across countries using Hofstede's cultural dimensions. We rely on a novel dataset of global sustainability influencers to empirically determine the forces that drive engagement for followers across the world. Our results indicate that the country match between the influencer and the followers is an important driver of engagement and is correlated with followers' consumption behavior of social media content.

## Chemistry

### **9. *Identifying Dissolved Organic Matter Leached From Microplastics in Aquatic Solutions with Fluorescence Spectroscopy***

**Presenter(s):** Emma Kocik, Gabriela Nerhood

**Advisor(s):** Dr. Aaron Harrison

As the prevalence of microplastics in marine ecosystems has continued to increase, many studies have focused on characterizing and quantifying physical microplastic particles. However, very few studies have analyzed the chemicals that are leached from these plastics into aquatic environments. Particularly, the dissolved organic matter (DOM) leached is of interest considering this new source of carbon could have potential implications for the marine carbon cycle, as DOM serves as a base of the oceanic food chain. Our study sought to determine the feasibility of using the combined tools of steady-state and lifetime fluorescence spectroscopy in identifying microplastic-sourced DOM in natural solutions. We simulated natural microplastic leaching by creating artificial microplastic solutions from different polymer varieties and irradiating these solutions with UV light and obtaining fluorescence measurements after fixed time periods. We found promise in applying the method to the polymer Polyethylene terephthalate (PETE), a plastic widely used in soft drink bottles, which was of interest as this polymer had not been used in previous studies. Moreover, lifetime fluorescence measurements were explored as a supplemental tool in further differentiating overlapping fluorescent components that appeared on the excitation-emission matrices (EEMs) obtained.

## Computational Science

### **10. *Computational Investigation of the Hypochlorous Acid (HOCl) Sensing Mechanism of the [Zn(Cys)4] Zinc Finger Domain in the Holdase Chaperone Hsp33 Protein***

**Presenter(s):** Dylan Arrazati

**Advisor(s):** Dr. O. Maduka Ogba

Zinc finger domains, comprised of the  $Zn(His)_x(Cys)_y$  architecture (where  $x + y = 4$ ), provide structural rigidity in proteins, mediate protein/DNA interactions, and act as redox switches. As redox switches, these domains detect biological oxidants produced by host systems and hence play an essential role for bacterial defense against oxidative killing. Despite this crucial role, molecular insights into how these zinc fingers sense hypochlorous acid (HOCl) – one of the most potent biological oxidants produced during inflammation – is still in its infancy. This work incorporates computational techniques to investigate the HOCl-sensing mechanism of a  $[Zn(Cys)_4]$  model for the holdase chaperone Hsp33 protein. The overarching goal is to elucidate the role of the zinc-complex in mediating the reactivity at the cysteines toward HOCl oxidation and compare these results to other HOCl-sensing zinc finger domains previously explored in our lab. Progress made toward these efforts so far will be presented.

### **11. *EEG-Based Motor Imagery Classification***

**Presenter(s):** Nancy Zhu

**Advisor(s):** Elnaz Lashgari, Tian Lan, Dr. Uri Maoz, Dr. Aaron Schurger

on-invasive brain-computer interfaces (BCIs) would allow those who lack more efficient modes of communication to interact with their surrounding environment, particularly through the use of motor imagery (MI). One of the aims of BCI is decoding an individual's intention. In particular, the ability to decode intentions would strongly enhance the scientific armamentarium used to investigate volition. Electroencephalography (EEG) has proved to be the most popular method due to direct measures of

neural activity, non-invasive, inexpensiveness, and portability for clinical use. EEG signals could provide a pathway from the brain to various external devices resulting in brain-controlled assistive devices for disabled people and brain-controlled rehabilitation devices for patients with strokes and other neurological deficits. One of the most challenging topics in BCI is finding and analyzing the relationships between recorded brain activity and underlying models of the human body, biomechanics, and cognitive processing. As a result, investigation of relationships between EEG signals and upper limb movement, real and imaginary, has become a fascinating area of research in recent years. To implement an EEG-based BCI system for a particular application, a specific protocol and paradigm has to be chosen for all phases of the experiment. First, the subject performs a particular task (e.g., imagery task, visual task) in order to learn how to modulate their brain activity while EEG signals are recorded from the scalp. Using the recorded EEG as training data, a neural decoder for the paradigm is generated. Afterward, the subject performs the task again and the neural decoder is used for BCI control. Motor imagery is described as imagining a movement rather than executing a real movement. In this research, we will explore EEG and other physiological signals such as ECG, respiration, EMG and pupillometry for motor imagery classification offline with consideration for real-time classification.

## **Data Analytics**

### ***12. Fear of Sexual Harassment in the Workplace***

**Presenter(s):** Tara Katims

**Advisor(s):** Dr. Ann Gordon

Sexual harassment within the workplace is a realistic fear for many individuals within the workplace, the variables contributing to this fear are as diversified as the individuals who experience this concern. Within my proposed research paper I would like to utilize the data set provided in the Fear V Methodology Report. Specifically, I would like to focus on question 17d, "How afraid are you of sexual harassment within the workplace?". There is no dominant explanation for this fear previous research has established, rather a plethora of factors that have contributed to the act of sexual harassment itself occurring more for specific demographics. Research has been limited in both the time of its' conduction (prior to the "Me too" movement era), as well as focusing on the percentage of sexual harassment occurring as a whole and not the percentage of individuals who fret this may happen to them. The data used is from the Fear V Methodology report The objective of my paper will be to determine what role gender, age, race and economic status play in the demographics that experience this fear the most. Following the era of the "Me too" movement I would like to identify the variables that contribute to individuals' level of fear surrounding this question. The purpose of this research will be to establish significant variables as well as enact contingency between combined variables such as "gender and race" or "age and economic status". This research paper will also consider the literature surrounding this topic. I plan to look for potential missing variables as well as determine if the present variables are relevant to the analysis. Additionally throughout this research paper I intend to incorporate other relevant variables within the ANES 2020 data, for example label [forgive4] which questions if one agrees there should be "zero tolerance for offensive remarks".



**13. *Evaluating Luminance to Local and Global Interference for Autistic Children***

**Presenter(s):** Ayra Tusneem, Riya Mody

**Advisor(s):** Dr. LouAnne Boyd, Dr. Vincent Berardi

The human ability to process visual information requires quick assessment and ongoing integration of multiple streams of information. For some people, the local and global visual information does not sync well which can create difficulty in understanding the “big picture”. Seeing the “big picture” is important to reading social situations effectively. In the current work, we created an assistive technology aimed to increase focus on global visual stimuli in photographs from everyday events. With the assistance of Speech Language Pathologists (SLPs) working with autistic children, we designed an experiment to test a high-fidelity prototype we call a global filter. In order to design this global filter, we leveraged an open source data set and created filter parameters with the SLPs’ input. The photographs were filtered to deemphasize less relevant local details. Using video recordings of eye tracking data, we analyzed the impact of luminance of shifting eye gaze to the global areas (“hitting” a “hotspot”. While the overall mean of luminance had no correlation with the hit rate, it played a statistically significant role in predicting a hit when the “not hot-spots”, or the dark background, was darkest. Implications of this finding are discussed.

**14. *Spatial Frequency Implications for Global And Local Processing in Autistic Children***

**Presenter(s):** Riya Mody, Ayra Tusneem

**Advisor(s):** Dr. Vincent Berardi, Dr. LouAnne Boyd

Visual processing in humans is done by integrating and updating multiple streams of global and local sensory input. Interaction between these two systems can be disrupted in individuals with ASD and other learning disabilities. When this integration is not done smoothly, it becomes difficult to see the “big picture”, which has been found to have implications on emotion recognition, social skills, and conversation skills. An example of this phenomenon is local interference, which is when local details are prioritized over the global features. Previous research in this field has aimed to decrease local interference by developing and evaluating a filter to help direct ASD patients towards normative processing of the global features in images. Within this process, this research focuses on whether an image’s spatial frequency was affected by the filter and how spatial frequency impacted the filter’s functionality. Spatial frequency can be defined as a measure of the periodic distribution of light versus dark in image. In this work, we isolated “hot spots”, which are areas in the image where the eye gaze of normative individuals fixated. Using the OpenCV package in Python, I implemented an algorithm to detect hotspots and draw a contour around each one. I then drew rectangles around the contours in each image and calculated the spatial frequency within each rectangle. Statistical analysis will reveal whether the spatial frequency of hot spots had an impact on the differences in normative and ASD fixations. We plan to use these findings to improve the image filter and conduct further research in this field.

## **English**

**15. *Resisting Performative Activism: A Rhetorical Analysis of the #MeToo Website***

**Presenter(s):** Brie Byers

**Advisor(s):** Dr. Ian Barnard

This piece serves as a rhetorical analysis of the #metoo movement’s official website. Through close examination of the aesthetic choices, content, and navigation, I show that the website utilizes different rhetorical strategies to better support survivors of sexual assault and create a conversation that guides survivors through the entire timeline they might experience following their trauma(s). The #metoo

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organization challenges conventional social media activism and creates a platform that allows survivors and allies to speak out and share their thoughts, feelings, and stories in a way that uplifts and encourages others. The website works in opposition to performative activism and instead offers an intentional interactive site to directly force the audience to engage in the content being displayed on the site. Through the creation of a platform that amplifies the voices of minority and oppressed communities, the #metoo movement encourages intersectionality and reframes #metoo as a space that does not tolerate white feminism.

#### **16. #MeToo: Why Twitter Doesn't Do Enough**

**Presenter(s):** Tara Mann

**Advisor(s):** Dr. Ian Barnard

In 2017 actress Alyssa Milano sparked the #MeToo movement as most people know it today. Unbeknownst to many, however, a black woman named Tarana Burke began the Me Too movement a decade earlier after working with survivors of sexual assault. As more and more injustice through discrimination comes to light, it is important to recognize privilege where it exists and what it allows to happen. This project is an analysis of the rhetoric of the #MeToo movement that aims to prove that this privilege is the problem with the movement. I intend to demonstrate how the use of Twitter to advance the movement is problematic because of its reliance on privilege and audience, things that even now are difficult for any non-white person to possess. In addition, I aim to show how the #MeToo movement has mostly succeeded in raising awareness but has largely failed to take any real action in changing the systems that allow widespread sexual harassment to take place. My research includes news articles, survey statistics, and interviews about the aftermath of the #MeToo movement and what has or has not changed, along with various tweets reviewed for both their content and their platform. This research is analyzed to support my conclusion that #MeToo is only the beginning of what needs to happen in order to eliminate sexual harassment.

## **Environmental Science and Policy**

#### **17. Transnational Privilege During the Climate Crisis**

**Presenter(s):** Joanna Falla

**Advisor(s):** Dr. Ann Gordon

The idea of man-made climate change has been common knowledge in America for decades, yet there is still a significant number of people who are steadfast climate deniers, regardless of scientific understanding. Past research has covered possible factors in one's upbringing to cause climate change denials, such as political parties or religion. We seek to answer the curiosity of climate change denial with a much simpler variable: location. The Earth is covered in a myriad of ecosystems, each with its own regional climate. People live across the globe, so each has different values and principles about the environment based on their community's climate. An effect of climate change is an increase in the frequency and severity of natural disasters, so people who live in at-risk areas directly experience the consequences of manmade climate change, perhaps making them more sensitive to the topic. Adversely, people who live in low-risk areas have fewer concerns about environmental consequences, thus allotting them the privilege of not having to believe in scientific reasoning and public outcry. We employ one survey containing three parts to assess the volunteer pool. Questions cover climate science aptitude, climate

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change beliefs, and general personal information gathered from the National Survey of Fear. The information gained from this study could be hugely beneficial for how the public talks about climate change. There is clearly some disconnect for climate change deniers, and learning exactly where that occurs in climate science communication is integral to its success. Environmentalists can use this data to create media content to spread awareness with specific audiences in mind; make it more accessible to everyone.

#### **18. Abstract on the Effects of Unclean Water**

**Presenter(s):** Samantha Bae, Samith Lakka, Khenny Norgay, David Chung

**Advisor(s):** Sam Risak

Our purpose for this project is to research and bring awareness about the deficiency of clean waters as well as the different causes of it around the world. We will be making a presentation that includes GIFs, as well as the modalities of text/language and short films that will bring to light the importance of water cleanliness. Our plan is to explicate the effects of unclean water and elaborate about the specific causes such as lead pipes, human waste, and pesticides. For our research methods, we will use business and environment-related articles that explore the negative effects poor water quality has on individuals and communities. We will also research by watching documentaries and taking small clips that will benefit our project's topic. As we are not able to meet physically to film something, we will create our own GIFs by researching effective ones on the internet. GIFs are a great way of gripping the audience as its nature appeals to a wider demographic. They are funny and easy to consume. As we look through these effects, we can expect that consumption of unclean water will generally lead to lack of brain functionality, diseases like Typhoid, Cholera, Dysentery, and even death. In regards to the water crisis in Flint, Michigan, the specific harmful effects were an increase in high blood pressure, kidney disease and infertility. Also, we realize that part of our project is to determine what causes communities to be exposed to unclean water and how the government is working to prevent this from happening. As we research deeper into the subject and the causes, we can find and expose certain businesses around the country that are the leading causes for unclean water and think of alternative ways of functioning.

#### **19. The Dangers of Overpopulation and How it Effects Our Environment**

**Presenter(s):** Teddy Moore, Reilly O'Connor, Christopher Hoile, Noah Weinstein

**Advisor(s):** Sam Risak

For our presentation, we are going to be talking about overpopulation and how it is affecting a variety of aspects of our society and our environment. To do this, we have made an informational podcast that features all four of us talking in a formal setting. We all thought this would be the best form to relay the information to a wide audience. Using a podcast, we were able to discuss, in depth, about the pressing issue of overpopulation in a conversational sense so that we didn't lose our audience. Also, since this issue affects people from all walks of life, we wanted to make sure that it can be listened to by any audience member at any time. This is where a podcast is the most effective, as it can be listened to at a specific time or while doing other work and the message will still be clear. In order to get some multi-modality in the mix, not only did we record our podcast, but we also decided to show some photos in order to incorporate some visual-focused topics. For our podcast, we will each have a topic of discussion that we will be explaining to the best of our ability through our own opinions and factual research. In our podcast, we talked about a variety of issues related to overpopulation: food shortage, and other natural resources used up by overpopulation, how our massive carbon footprint is affecting our climate, how this many people in this condensed of a space is affecting other life forms, such as animals, plants, and other forms

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of wildlife, and how people are affected when it comes to a financial point of view. For example, how there aren't enough jobs in our economy for everyone to live care-free. Many people listen to podcasts like Joe Rogan's The Joe Rogan Experience or NPR's Planet Money and after looking more closely at them we were able to understand why they had drawn in such a large following. Joe Rogan uses a variety of guests to liven up the show while also using a video feed of the room. This allows the audience to feel like they were in the room with him and bridges the gap between creator and listener.

## **FFC**

### **20. *Odin and Odysseus: A Heroes Journey***

**Presenter(s):** Julian Deck

**Advisor(s):** Dr. Eileen Jankowski

Norse Mythology and Greek mythology share many similar tropes and characters. Odin is the Norse god of wisdom and the king of the Aesir tribe, his greek counterpart is Odysseus. Odysseus is also a king and soldier. Both of them baer this nature of self curiosity that leads them on journeys of self discovery. Odin and Odysseus are not merely strong warriors but also wise and honest lovers and in some instances in touch with the more feminine side of themselves. Through my research I will show how both mythologies, Greek and Norse, have counterpart characters, that through extreme measures, reveal important archetypal themes for humans. These archetypes give humans a road map for what to strive for. The themes are the same across these two mythologies and both try to teach similar lessons. I will specifically focus on the journeys of Odin and Odysseus.

### **21. *The Personification of Death***

**Presenter(s):** Miguel Grillo

**Advisor(s):** Dr. Eileen Jankowski

The Personification of Death, Often times portrayed as a skeletal figure, the Grim Reaper wields a scythe or sickle that is said to collect and transfer souls to and from the afterlife This mythical figure originates from European base folklore and is often portrayed as the living embodiment of death itself. Alongside his scythe, the Grim Reaper is said to carry around an hour glass, waiting for your time to expire. For generations the story and appearance of the Grim Reaper has remained the same, haunting people to this day. In films, this mythical figure appears in darkness, wielding his scythe and wearing a hooded black cloak. The Grim Reaper is very similar to the Greek god Thanatos. In ancient Greek religion and mythology, Thanatos was also considered to be the living embodiment of death, like the reaper. After the fates decide someones life has expired, Thanatos appears to carry people into the underworld, similar to how the Grim Reaper uses his scythe to reap the souls of humans. Unlike the Greek god Erinyes, Thanatos was known to give peaceful death by simply touching someone. Both Thanatos and the Grim Reaper are the living embodiments of death within their respected cultures, sharing many similarities.

### **22. *Osiris versus Hades: How Two Ancient Cultures Viewed the God of the Underworld and the Afterlife***

**Presenter(s):** Kate Meinert

**Advisor(s):** Dr. Eileen Jankowski

The ancient civilizations of Egypt and Greece both imagined a very distinct pantheon of gods that they honored, respected and incorporated into their everyday lives. They paid homage to these gods in the hope that the gods would bless them and give them prosperous lives. Many mythological gods throughout different cultures and civilizations overlap in one way or another, whether it be in their qualities or what

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they represent. The Egyptian god Osiris and the Greek god Hades are examples. Both of these figures are seen as the god of the Underworld in their culture. While these two gods both oversee the land of the dead and the afterlife, Osiris and Hades rule their version of the Underworld and their dead in very different ways, depending on their particular culture's views. The ancient Egyptians viewed death as a continuation of life and therefore would mummify their dead to allow their soul to be reborn in the afterlife. The ancient Greeks also believed that their soul continued to live on in the Underworld, but they viewed the afterlife as meaningless compared to their earthly life. The ancient Egyptians honored Osiris religiously and therefore did not fear death but rather saw it as an entrance into the next part of their life. On the other hand, the ancient Greeks greatly feared the evil Hades and his Underworld. Ultimately, Osiris and Hades embody the views of the death and afterlife within these two different cultures.

#### **23. *Kanaloa Transformed***

**Presenter(s):** Olivia Ng

**Advisor(s):** Dr. Eileen Jankowski

The earliest history of Hawaiian civilization dates as far back as 400 C.E., when Polynesians from the Marquesas Islands voyaged over 2,000 miles to colonize the islands of Hawaii. The people brought with them Polynesian myths that became the foundation of the Hawaiian pantheon. One of the four main gods is Kanaloa. In Polynesian myths, Tagaloa (his Samoan name and one of many) is known as the god of the underworld and death, somewhat resembling the devil. This dark depiction comes from the creation of man: Kanaloa was the only god who was unsuccessful. His jealousy for the other gods led him to create other things, meant to bring bitterness and sorrow. Yet in Polynesian culture he is also credited as one of the world's creators. Hawaiian myths acknowledge these powers, but limit them to creating water. In the stories he arrives with Kōne, another one of the major gods, from the Kahiki Pillars, which held up the sky. The two gods roam Hawaii, expanding the powerful ocean and creating springs on the islands. In this way Kanaloa's significance is transformed, and he eventually takes his place as the main ocean deity in Hawaiian culture. Kanaloa has many sea creatures as his kino lau (many embodiments). He is the lord of the ocean and its winds, deity of the ocean currents and navigation, and god of fisherman and healing. Besides the healing plant *Waltheria indica*, the octopus, squid, dolphin, and whale are among many plants and animals of Hawaii associated with the powerful god. In chants honoring Kanaloa, Hawaiians ask for assistance in healing a patient, or ask for protection on the sea when fishing or sailing. The ocean's spiritual importance dates as far back as when the first canoes reached the shores of Hawaii.

#### **24. *Diving into the Myth of Pele***

**Presenter(s):** Alyson Panglao

**Advisor(s):** Dr. Eileen Jankowski

Pele, the fire goddess of the islands of Hawai'i, is one of a family of seven sons and six daughters born to Haumea and Moemoe. Pele is known as the Goddess of Fire, wind, lightning, and is most well known for being the Goddess of Volcanoes. There are many stories of Pele. A particularly famous story shows how Pele came to reside in Hawai'i; Pele was expelled from her homelands, and so migrates from there in efforts to find a deep pit to house herself and her family. Her brother Kamohoali'i gives her a canoe, and a few of her brothers and sister Hi'iaka accompany her on the journey to Hawai'i. She approaches the islands from the Southwest, traveling between islands and stopping at Kauai during a hula festival. There she falls in love with the chief Lohiau. She longs to marry him but continues her journey to find a home, finally settling on Hawai'i island on the crater of Mokuaweoweo. Pele successfully digs the crater without striking water - the first island that she is successful in doing this; so she decides to reside on the Island of Hawai'i at Kilauea. Then she sends Hi'iaka to find the chief Lohiau whom she plans to share her new home

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with. It is here that things get very interesting as Hiʻiaka and Lohiau end up together (Hiʻiaka was very beautiful and Lohiau had fallen in love with her), and Pele is incredibly enraged. She first tries to send two of her other sisters to destroy the lovers, but they are also enamored with Lohiau's attraction so they too fail. Pele then, in a fit of jealousy and rage, sends fire over the two lovers; Hiʻiaka cannot be destroyed as she is a goddess but Lohiau is consumed by the flames. Hiʻiaka then digs through the Earth to find him, and she eventually does and they are reunited.

#### **25. *La Llorona: A Glimpse into the Representation of Women in Myth and Media***

**Presenter(s):** Camille Rovero

**Advisor(s):** Dr. Eileen Jankowski

The story of La Llorona has been passed down from generation to generation in different Hispanic communities, often used as a ghost story to keep children from misbehaving. There are many versions of her origin, but the main story is about a woman who is having issues with her husband, where he is either cheating on her or she is jealous of the attention he gives to their children. She then ends up drowning her children, either accidentally or on purpose, and is left to haunt the woods in search of other children to replace the ones she lost. The story changes depending on who is telling it, but the woman can often be viewed as either lonely and mistreated or jealous and mentally unstable. Most versions tend to lean towards the latter, bringing forth the issue of the misrepresentation of, specifically, Latin women in popular media. This view of La Llorona perpetuates the misogynistic idea that women are quick to overreact and make rash decisions. Looking at the different ways that La Llorona is depicted and who is telling these stories can help show the underlying meaning and consequences of this popular Hispanic horror story.

## **Film**

#### **26. *Rise of Korean Cinema and Its Impact On The United States***

**Presenter(s):** Sera Kim

**Advisor(s):** Dr. Jocelyn Buckner

Korean Cinema is growing rapidly by making its marks in the film industry. For some time, Hallyu, the term for Korean Cinema, swept people off their feet with their blockbusters. The Korean New Wave emerged as the absurd Korean restrictions and censorships that were previously enforced on imported foreign films finally lifted in the late 80s. This resulted in an influx of Hollywood blockbusters and a drastic decline in the popularity of Korean Cinema. For Korea to protect the country's industry, the government enforced policies that shifted the focus to export Korean culture. Since then, it has been around for more than two decades in the United States with only this year reflecting the utmost attention to Korean Cinema. During the 2020 Oscars, the comedic thriller Parasite became the first international film to win the Oscars. It is important to recognize and put in the effort to understand Korean Cinema as it will help America accept other cultures beyond its own. It is significant to import foreign films to learn from other countries as they did from Hollywood. In this paper, I will research the elements within Memories of Murder, Taxi Driver, and Parasite, such as the genres of the film and the visual designs to explain the rise and impact of Korean Cinema in the film industry and American culture. Actively accepting foreign films, meaning actively screening in theatres and not neglecting them from Oscars, will make a difference in how Americans view foreign culture and lead to embracing the value of diversity. I write this paper with the hope that America continues to diversify its culture by exploring and respecting non-American cultures.

## **Food Science**

### ***27. Effectiveness of Registered Dietitians on Adults with Type 2 Diabetes and Chronic Diseases***

**Presenter(s):** Laurel Dobrow, Isabella Estrada

**Advisor(s):** Dr. John Miklavcic

The purpose of this literature review paper is to analyze and establish the importance of registered dietitian (RD) involvement in the treatment of type 2 diabetes by quantifying how their inclusion in an interprofessional team can improve patients' self-management of their disease and comorbidities. Hemoglobin A1c (HbA1c) levels, blood serum glucose levels, blood pressure, body mass composition, and the number of medications used before and after registered dietitian intervention were analyzed. Other intersections examined with registered dietitian involvement include patients' perception of mental health and quality of life in addition to the roles of informal and formal caregivers in patient adherence to recommended dietary choices and medication usage. The use of an RD in an interprofessional team for type 2 diabetes patients has shown to reduce HbA1c levels and blood glucose levels. RD involvement has also shown improved body mass composition and well maintained or reduced weight. Patients who did not receive RD advice experience a perceived reduction in quality of life and poorer mental health status relative to patients that did receive RD intervention. Patients with formal and informal caregivers involved in the RD recommendations resulted in lower HbA1c levels and increased medical advice seeking. It was found that registered dietitians play an integral role in patient diet education which results in improved glycemic control, lower HbA1c, improved weight management, enhanced quality of life, improved comorbidity management, and increased self-efficacy in treatment. Early registered dietitian intervention is more cost-effective relative to the costs associated with treatments for neglected, poorly controlled type 2 diabetes. The role RDs possess in patient diet and nutrition education have shown to be essential in type 2 diabetes management and would behoove policy and decision makers to include RDs into their type 2 diabetes interprofessional team for improved patient health outcomes.

## **History**

### ***28. Science, Sorcery, and Sin: The Defense of Natural Magic by Christian Scholars in Early 16th-Century Europe***

**Presenter(s):** Sandra Serwin

**Advisor(s):** Dr. William Cumiford, Dr. Shira Klein Dr. Alexander Bay

My research project examines the study of 'natural' or 'learned' magic by male Catholic scholars in early 16th-century Europe, and explores how these men struggled to propose new ideas about science and religion while remaining within papal boundaries. My main inquiry is how the scholars successfully defended themselves against accusations of witchcraft by the church, despite being openly engaged in magical study. Historians of the European witch-hunt rarely attempt to find connections between the few male magicians of the era, or engage in nuanced discussions about them as a group instead of as individuals. Furthermore, there is no definitive study on how the specific group of Reformation-era male magicians justified natural magic, or distinguished themselves as different from accused 'witches'. I will initiate this scholarly dialogue by identifying patterns in the works of late-15th and early 16th-century scholars Johannes Trithemius and Heinrich Cornelius Agrippa von Nettesheim from Germany, Giovanni Pico Della Mirandola from Italy, and Paracelsus from Switzerland. These men were all well-educated and devout Christians who studied natural magic under the firm belief that they were not engaging in heresy.

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I will argue that these scholarly magicians used traditional Christianity, early Renaissance Humanist philosophies, and criticism of the church and academia to defend their work as heresy-free, but were unwilling to abandon the church entirely. In fact, instances when occult scholars intentionally strayed from the Christian religion were essentially non-existent.

## Music

### **29. *Jews Rock: Understanding How Jews Helped Shape the Birth of American Rock Music***

**Presenter(s):** Madison Magursky

**Advisor(s):** Dr. Jessica Sternfeld

American rock emerged from a melting pot of influences, originating as rock and roll in the late 1940s and early 1950s which in turn drew from several other genres such as rhythm and blues, jazz, folk, and more. Compared to their impact on other popular art forms, Jews are not seen as having a substantial presence in the overall rock era of mid 20th century America, other than some important individual contributions. However, there is a significant Jewish impact on rock music and the birth of this genre as a whole that is oftentimes overlooked. Jewish influence on the development of rock extends into two facets, the first being contributions to influential genres and the second being a presence in the record business. This essay provides a historical account of the Jewish impact on American rock through contributions to the musical genres it directly stemmed from as well as to the infrastructure that allowed the rock industry to flourish. In doing so, this paper serves the purpose of shining light on the often silenced imprint of Jews on this powerful musical genre. A major aspect of this analysis involves the complicated topic of race relations, considering that rock and roll emerged primarily from historically Black genres such as rhythm and blues. While it is absolutely necessary to acknowledge and celebrate the African American origins of certain genres, Jewish influence and respective Black-Jewish relations within these musical styles should be accounted for as well. Despite the vacillating, somewhat turbulent relationship between Blacks and Jews throughout the 20th century, the two groups share a significant musical past that must be recognized.

### **30. *Exposing Music's Biggest Night***

**Presenter(s):** Erica Marfo

**Advisor(s):** Dr. Jessica Sternfeld

Once referred to as 'Music's Biggest Night', the Grammy Awards sixty-one years in the making, has seen better days. The evolution of music and technology from the Recording Academy's start in 1959, has not quite matched the social change and movements of the world surrounding it. The underlying sexism and racism within the industry and the Recording Academy have begun to unravel the infamous award show, exposing voting issues, and other discrepancies, plummeting their viewership rates. There has been a growing sense of unity among artists in the music industry, encouraging artists and executives alike to speak out against injustices, and the invisible patriarchal grip that will not seem to disappear. Big artists like Drake, Adele, Frank Ocean are calling for reform in all areas to win back the trust of artists and music lovers globally. In this paper I address the extensive, interior issues of the Grammy awards, the Recording Academy administration and offer a solution to move forward in an inclusive way that puts music first above all. I also raise the question if the award show is even worth saving, or if it could be salvaged in any sense.



**31. *The Forgotten Remedy: An Analysis of the Underutilization of Music Therapy as a Treatment Option***

**Presenter(s):** Abbey Umali

**Advisor(s):** Dr. Jessica Sternfeld

Throughout history, different forms of music therapy have shown substantial results as treatment options for individuals with a variety of illnesses and disabilities. Research shows that music therapy treatments often lead to healing and the reduction of symptoms for children with mental illnesses. Not only does music therapy have emotional benefits, but it has physical ones as well. Especially when the therapy involves playing an instrument or some other form of movement, individuals with disabilities are often able to improve fine motor skills, coordination, strength and flexibility, and more. Additionally, music therapy is a particularly desirable treatment option because unlike most medications used to treat behavioral or mental issues, it has few to no negative side effects. Even though vast amounts of evidence point to the efficacy of music therapy, many barriers exist that have prevented it from becoming fully accepted into the medical, psychological, and educational fields. Stigma, reduced access to treatment, and a lack of education surrounding the benefits of music therapy have contributed to its underutilization in these fields. Obtaining state licensure for music therapists is the first step, but much more additional advocacy will be necessary to ensure its complete integration. This project examines the factors that contribute to the underutilization of music therapy in society, justify its value, and propose practical solutions that will encourage its implementation in mainstream treatment plans.

## **Physical Therapy**

**32. *Does Toe Walking Influence Activities of Daily Living (ADL) in Idiopathic Toe Walking Children Compared to Healthy Counterparts?***

**Presenter(s):** Suongyen Jeon, Michael Shiraishi, Sarah Caruthers

**Advisor(s):** Dr. Rahul Soangra

The pattern of walking on the toes without any heel contact is categorized as toe walking. Clinicians have not reported any cause for toe walking therefore it is more commonly known as idiopathic toe walking. Idiopathic toe walking (ITW) usually begins in early childhood, and some children are able to grow out of it, however, some other children continue toe walking even into their teens. Toe walking should be taken seriously because continued toe walking can lead to balance issues and an increase in fall risk. The purpose of this study is to investigate if toe walking influences the activities of daily living in children. Ten healthy children and 10 Idiopathic toe walking children participated in this study. The participants wore a McRoberts IMU (Inertial Measurement Unit) attached to their sacrum level for three days of longitudinal data collection. All ADL tasks were performed non-intrusively in their natural environment. Data from one weekday were juxtaposed to data from one weekend day for the purpose of analyzing activities and identifying trends that are specific to toe walkers. Any observed trends were further analyzed and studied with the goal of determining the effects of idiopathic toe walking on ADL tasks by comparison between the age and gender-matched controls and the toe walking children.

## **Physics**

### **33. *Analysis of the Transmon Architecture and the Cross-Resonance Gate***

**Presenter(s):** Trevor Kling

**Advisor(s):** Dr. Justin Dressel

Quantum computing is a burgeoning field of research in the fields of physics, computer science, and mathematics. As a fundamentally different and potentially more powerful method of constructing computers, quantum computing has applications in finance, chemistry, and many-body physics. However, in order to realize the benefits of quantum computing, the current systems need to be scaled to much larger sizes and perform with greater accuracy. To facilitate the development of scalable quantum computers, high fidelity gates for both one- and two-qubit operations are required. This project presents a numerical framework for the analysis of errors in one such operation on superconducting transmon qubits, the cross-resonance gate. The program includes methods to simulate the behavior of transmon qubits, the cross-resonance gate itself, and several environmental effects which degrade performance. These methods are implemented in Julia, with an interface designed to closely match the parameters which can be measured in the lab. Early numerical results clearly show the dependence of the cross-resonance gate on the anharmonicity and higher energy levels of the transmon model. In addition, further investigations demonstrate the degrading effects of various chip parameters for the performance of the cross-resonance gate.

## **Political Science**

### **34. *The Dangers of "Acquaintance" versus "Stranger" Rape.***

**Presenter(s):** Allison Flame

**Advisor(s):** Dr. Ann Gordon

The "Stranger In A Bush Myth" creates a dangerous misconception about the reality of Sexual Assault. Through the media, individuals are wrongly being taught that perpetrators can be identified, and that a broken legal system will protect them. Sexual Assault is made out to seem like a predictable act; one that can be prevented, leading survivors to feel an immense amount of shame, guilt and confusion surrounding the traumas they have endured. Throughout this paper, I will be debunking this myth by diving into the demographic features and the personal factors that influence women to be more aware of a "Stranger Rape" than of an "Acquaintance Rape." This paper will analyze the research provided by the American Fears Survey, which shows that fear levels are higher for rape by a stranger, despite there being a higher likelihood of a rapist being known to the victim. While research has shown that the post trauma psychological effects differ little in terms of "Stranger" versus "Acquaintance" rape, this paper will attempt to address if this is accurately manifested in reality. Vulnerability Theory focuses on the concept that human beings are embedded in social relationships and institutions. By challenging the dominance of the individualized legal subjects, Vulnerability Theory argues for the recognition of actual human lives as socially and materially dynamic (Kanayson 2019). The data I will be focused on looks at how Vulnerability Theory factors into Acquaintance Rape. By using specific categories based on the Perpetrator-Victim relationships, this paper will allow for a comprehensive view of the uniqueness of individual "Acquaintance Rape" cases.

**35. *The Effect of White Supremacist Groups in a Changing America***

**Presenter(s):** Kylie Sabin

**Advisor(s):** Dr. Ann Gordon

White Supremacist groups in the U.S. are more of an increasing threat than one may currently think. The recent rise in membership and the number of groups pose a threat to national security and the well-being of those residing in the country. This fact is as scary as the harm they have physically caused racial and religious minorities, but yet, not much is being done about their existence or their acts of hatred. Previous literature on the topic has given insight to the rise of these groups and their motivation, along with perspectives on what it is like to be someone targeted by these groups and the toll it takes on their physical and mental well-being. Using the Chapman University Fears Survey, the level of fear of White Supremacist groups among some of the races and religions targeted by these groups and those who fear that whites will no longer hold the majority in America will be discussed. In addition, using the Fears Survey, the party identification of respondents, along with where they receive their news from (i.e. CNN or Fox News) will be analyzed in correlation with the rise of these groups in recent years and the respondent's feelings toward the groups.

**36. *The Identity and Challenges of Asian Americans Voters***

**Presenter(s):** Orion Huang

**Advisor(s):** Dr. Ann Gordon

One of the fastest-growing racial groups in the United States, consisting of fifteen ethnicities and about four percent of the electorate body, Asian-Americans are a small voting bloc that is often overlooked during national elections. Most of the literature focuses on the Asian American relationship between political participation and identity or the discussion of group attachment in the pan-ethnic identity. In the past two decades, Asian American voters have been steadily moving toward the Democratic Party: In 1992, National Election exit polls conducted its first year of data on Asian American voting patterns, 55 percent went for George H.W. Bush instead of Bill Clinton. The 2016 presidential election was pivotal as 65 percent of Asian American voters chose Hillary Clinton over Trump. Yet, Asian Americans remain the lowest voter turnout, and a majority of voters being naturalized citizens rather than U.S.-born (Pew Research Center 2018). With the upcoming 2020 Presidential Election, the Asian American voting bloc has the potential to be an integral component for the Democratic party. From the data from the American National Election Survey, my analyses find that there is a lack of Asian American daily political participation and impressive Asian American democratic mobilization. I investigate the possible causes of low Asian American voter turnout and Asian American progressive thinking using the debate between national origin and pan-ethnic identity. The findings of my research will reveal that Asian Americans lack political conversation and have swayed towards progressive candidates. The Asian case of Asian Americans presents new insight into how racial identification influences individual political behavior and attitudes. The literature seeks to explain the findings by highlighting the pan-ethnic identity and the implications for future national elections, in addition to advocating for the need for increased Asian American political participation.

## **Psychology**

**37. *Exploring Optimism and Purpose in Life as Mediators of the Association Between Childhood Socioeconomic Status and Common Cold Susceptibility***

**Presenter(s):** Stephanie Munduruca, Vivian Luong

**Advisor(s):** Dr. Brooke Jenkins

According to the U.S. National Library of Medicine, Americans suffer from 1 billion colds a year. Correspondingly, previous research has shown that lower socioeconomic status (SES) during childhood is associated with lower adult health, including decreased resistance to the common cold. This correlation between childhood SES and common cold susceptibility may be mediated by an individual's optimism and purpose in life. Of interest, several studies have found evidence that higher childhood SES is associated with a higher purpose of life and higher optimism. Furthermore, previous evidence has confirmed that higher optimism and higher purpose of life are linked to better overall health, including greater resistance to developing the common cold. More specifically, both higher optimism and higher purpose in life are associated with better physical health and less unhealthy behaviors, thereby strengthening the immune system and increasing resistance to the common cold. Given this past research, this study analyzes the relationship of childhood SES and susceptibility to the common cold, mediated by optimism and purpose of life. Data was obtained from the Common Cold Project, analyses were conducted among 213 adults between the ages of 18 and 55 who were exposed to rhinovirus through nasal drops. Subjective and objective measures of both childhood SES and common cold assessments were used in the mediation analysis, which was performed using the PROCESS macro tool on SPSS. Significant correlations were found between the direct effects of subjective childhood SES and optimism ( $b = 0.31, p = 0.040$ ) and optimism and subjective measures of cold ( $b = -0.09, p = 0.023$ ). However, mediation analyses suggested that neither optimism nor purpose of life mediated the association between childhood SES and susceptibility to the common cold for all objective and subjective assessments (i.e., they did not account for the indirect effect). Overall, more research is needed to understand the mechanisms by which childhood SES is associated with health outcomes, such as the common cold.

**38. *Stress and Negative Affect as Mediators in the Association between Parental Social Support and Lung Function in Adolescents with Asthma***

**Presenter(s):** Amber Osorno

**Advisor(s):** Dr. Brooke Jenkins, Dr. Eric Sternlicht

Asthma is the leading chronic condition amongst children in the United States as 7.5% of children are diagnosed with asthma. Studies have shown that positive social support is associated with positive asthma management. A strong social support system predicts good management of asthma symptoms; however, current literature has not yet examined how social support impacts lung function as opposed to merely symptom management. Stress and negative affect have been revealed to be associated with worse asthma control, as well as exacerbation of symptoms. Similarly, negative affect has been analyzed as a causal factor for worsening asthmatic symptoms. Therefore, this pilot study sought to assess parental social support, adolescent stress and negative affect, and adolescent biological lung function to determine whether these affective processes (negative affect and stress) might serve as mediators in the association between social support and lung function. Adolescents suffering from asthma ages 12-17 (mean age = 13.9) ( $n = 21$ ) were recruited from the pediatric asthma clinic at CHOC Children's Hospital of Orange County for this pilot study. Participants were asked to complete a baseline survey upon recruitment assessing parental social support and stress. Seven consecutive days thereafter, for 4 times a day, participants were given a spirometer and asked to record lung function values including Peak Expiratory

Flow (PEF) and Forced Expiratory Volume in 1 second (FEV1) as well as negative affect emotionality. Regression analysis revealed that higher levels of parental social support were associated with lower negative affect,  $b = -0.44$ ,  $p < 0.05$ , and stress,  $b = -0.40$ ,  $p < 0.05$ . However, there was no association between parental social support and lung function, for both PEF and FEV1 values. Implications for this study suggest that children with asthma who have more social support from parents have less stress and less negative affect. Next steps in this work are to analyze these mediators again, by recruiting more participants to the present study.

**39. *Child Postoperative Pain: Impact of Child Temperament and Parent Mood on Pain After Surgery***

**Presenter(s):** Harshitha Venkatesh

**Advisor(s):** Dr. Brooke Jenkins

Around 80% of children who undergo surgery experience moderate to severe postoperative pain. Various psychosocial factors contribute to exacerbations of this pain. A child's inborn personality traits and style of interaction with the environment are known as temperament. Children who are less sociable and more distress-prone (e.g., those who cry, throw tantrums) are more likely to have an anxious temperament. This anxiety before and after surgery may lead to an increase in postoperative pain levels as well. Overtime, a parent's mood may change how they perceive child pain. Parents who have more negative moods or report their child's pain as worse and have a negative impact on a child's pain. Given this, the purpose of this study was to see how child temperament factors are associated with postoperative pain and how parent mood moderates this relationship. These specific factors are analyzed in a sample of children ages 2-13 who underwent elective surgery at the Children's Hospital of Orange County (N = 112). Parents completed online surveys assessing child temperament and parent mood. Postoperative pain measures were reported by both children and parents after surgery on days 1, 3, and 7. Child temperament factors did not interact with parent mood to predict postoperative pain. Emotionality and sociability were not significantly associated with parent pain measures or child pain after surgery ( $ps > 0.05$ ). However, other studies have shown that child temperament does affect pain in a hospital setting more than they do at home. Interestingly, pain in children was low at home after surgery (less than 3 on a scale of 0 to 10). It is possible that the impact of temperament and mood on pain were less potent once the child is at home. Further investigation on the influence of temperament and mood on child pain is important to obtain more clarity and discover optimal methods of treating pain in children. Future work may benefit from investigating different surgical procedures that might lead to a greater diversity of pain once children are home.

**40. *Testing Coping Flexibility and Psychological Distress with Resilience over Time***

**Presenter(s):** Renee Grace Acupan

**Advisor(s):** Dr. David Pincus

Coping flexibility is the ability to stop an ineffective coping strategy and begin a new one according to the situation. Based on the coping flexibility hypothesis, the ability to adapt to new coping strategies will help reduce psychological distress. Past research has shown greater coping flexibility being related to lower levels of depression and anxiety; however, the research does not dive into the relationship between coping flexibility, resilience (e.g. self- and interpersonal relationships, mental flexibility, and emotional conflict), and time. The research indicates that different coping strategies and these different aspects of resilience have a relationship with each other. For example, a parent-child relationship filled with conflict may cause someone to use emotion-focused coping, but if peer social support is available, the person may use problem-focused coping instead. The efficacy of coping flexibility is also affected by time, but the

measurements are given by a single-time questionnaire. The goal of this literature review is to inform the hypotheses in a future study that will measure coping flexibility against these aspects of resilience as they change over time.

**41. *The interaction Between a Healthy Lifestyle and Offsetting Genetic Risk for Type II Diabetes***

**Presenter(s):** Megan Badgley

**Advisor(s):** Dr. Jennifer Robinette

More than 34 million people in the United States have type II diabetes. Both molecular and behavioral geneticists have confirmed a genetic basis for type II diabetes. However, there are various resiliency factors, such as a healthy lifestyle, that can lower the risk for type II diabetes. The current study examined whether healthy lifestyle behaviors, such as not smoking, getting adequate exercise, body mass index (BMI), and avoiding excess alcohol consumption, can combat high genetic risk for type II diabetes. Using the 2018 wave of data from the Health and Retirement Study, a composite variable was created that includes diet, physical activity, BMI, smoking, and alcohol consumption. Participants reported whether or not they had ever been told by a doctor that they have type II diabetes. The scale of genetic risk for a certain trait, such as type II diabetes, was calculated using polygenic scores. It is hypothesized that those with high polygenic risk scores for type II diabetes are more likely to have been diagnosed with type II diabetes, but that healthy lifestyle would attenuate this genetic influence. Results of a weighted logistic regression model suggested that genetics and healthy lifestyle both individually affect whether one has diabetes, but the two variables did not significantly interact, adjusting for race/ethnicity, age, sex, depression, and socioeconomic status. Future research will explore whether other factors, such as support from loved ones, may be a resiliency factor that combats high genetic risk for type II diabetes.

**42. *Social Support as a Protective Factor Against the Genetic Risk of Depression***

**Presenter(s):** Valerie Lee

**Advisor(s):** Dr. Jennifer Robinette

Depression is the leading cause of mental disability. There are likely multiple etiological factors in the development of depression, including genetics, psychosocial, and environmental risk factors. Despite a genetic basis, some individuals are relatively resilient to depression, and psychosocial resources are often leveraged as a treatment to reduce depressive symptoms. Few studies have examined the extent to which social support can offset genetic risk for depression. Data from the Health and Retirement Study were used to test the hypothesis that people with genotypes associated with depression will be more likely to have been diagnosed with depression, but that this genotype-phenotype association will be weaker among those perceiving more support from social network members. Polygenic risk scores, summary measures that quantify the genotypes for depression a person carries, were used to assess genetic risk. Participants reported whether or not they had even been told by a doctor that they had a major depressive disorder. Other factors that may exacerbate risk for depression, such as age, sex, race/ethnicity, traumatic history, and education status, were included as covariates. A weighted logistic regression model was used to test the hypothesis that greater perceived social support from social network members would offset genetic effects on depression. Results indicated that although support from all types of network members was associated with a lower risk for depression, none significantly interacted with the polygenic risk score of depression. Both genetic and social factors appear to shape depression risk, and future research should investigate alternative psychosocial factors that may successfully reduce genetic risk for this debilitating mental health problem.

**43. *Anxiety and Sleep Quality in U.S. Adults During the COVID-19 Pandemic***

**Presenter(s):** Brianna Dinn, Natalie Standridge, Clarissa Tadros

**Advisor(s):** Dr. Tara Gruenewald

Ever since the outbreak of the coronavirus SARS-CoV-2 that causes the COVID-19 disease was declared a pandemic by the World Health Organization, people across the world have experienced significant alterations in their daily lives and many have experienced significant threats to their economic, mental, social, and physical well-being. Recent research conducted in other countries such as Brazil and Italy have seen significant increases in anxiety and stress symptoms as well as a decrease in overall sleep quality (Barros et al., 2020; Marelli et al., 2020). This current study aims to examine the experience of anxiety and patterns of sleep quality during the first six months of the COVID-19 pandemic in a national sample of adults in the United States (U.S.). A total of 1,746 participants were recruited from 43 different states in the U.S. through the Amazon Mechanical Turk platform to complete three waves of surveys regarding their COVID-19 experiences, psychosocial well-being and behavior patterns. Based on previous research, it is predicted that anxiety and poor sleep quality will increase over the course of the pandemic. It is also hypothesized that increases in anxiety and poor sleep will be correlated with one another. Analyses will examine specific COVID-19 experiences and threats that may contribute to anxiety and poor sleep. Study findings are expected to help us better understand how psychological factors, such as anxiety, experienced during these unprecedented times can impact biological aspects such as sleep quality.

**44. *Suspicious and Unhelpful? Does Greater Belief in COVID-19 Conspiracy Theories Lead to Lower Prosocial Behaviors and Orientations?***

**Presenter(s):** Natalie Standridge, Clarissa Tadros, Brianna Dinn

**Advisor(s):** Dr. Tara Gruenewald

Conspiracy theories are beliefs that a group of individuals is attempting to achieve sinister goals in secret. These beliefs usually result from fear and existential threat and are associated with negative consequences such as decreased psychological and physical well-being. The COVID-19 pandemic has impacted many people in the United States, and in recent months, there has been growing popularity of COVID-19 conspiracy theories. These theories include the belief that the virus is not as dangerous as it is presented to be, that the virus is human-made, and the virus spreads in ways that are unsupported by scientific research. Belief in COVID-19 related conspiracy theories can be dangerous to public well-being, as these beliefs are associated with lower preventative behavior and greater self-centered prepping behavior, such as hoarding. This study intends to analyze how COVID-19 related conspiracy theory beliefs are linked to COVID-19 prosocial behavior and general prosocial orientations over time. Analyses will utilize data from a national sample of over 1,700 U.S. adults collected through the Amazon Mechanical Turk platform. Participants completed online surveys over an approximately 6-month period (April, July, September-October) to assess COVID-19 pandemic attitudes, experiences, and behaviors, and psychosocial and physical well-being. Measures included an assessment of conspiracy theory beliefs concerning COVID-19 and assessments of prosocial orientations (i.e., generativity) and COVID-19 related prosocial behaviors. We hypothesize that belief in COVID-19 conspiracy theories will be associated with lower levels of COVID-19 prosocial behaviors and general prosocial orientations (generativity). We predict that COVID-19 prosocial behaviors will decrease at a faster rate for individuals who believe in COVID-19 conspiracy theories than those who do not. Study findings will contribute to our understanding of the potential role of conspiracy beliefs in shaping prosocial behavior during public health threats.

**45. *Smart Homes for Smart Health: Developing an Interactive System to Reduce In-Home Secondhand Smoke***

**Presenter(s):** Janice Han, Christie Kika

**Advisor(s):** Dr. Vincent Berardi

Smoke from any source is potentially harmful because it contains fine particulate matter that is associated with acute and chronic conditions. Second-hand smoke (SHS) is particularly unsafe for children due to biological characteristics (higher breathing rates, immature lungs and underdeveloped immune systems) that make it difficult to filter toxins. To address this concern, researchers recently completed Project Fresh Air (PFA), an NIH-funded R01 intervention that installed air particle sensors in the households of tobacco smokers who lived with children. The purpose of our research was to extend PFA by developing a smart home device that interacted with an air particle monitor and allowed household participants to track SHS in various living spaces and receive an intervention aimed at reducing SHS in order to protect the health of children residents. Specifically, Amazon Alexa and Awair air quality devices were incorporated into a monitor. When fully developed, these smart home systems will be used in an intervention aimed at decreasing SHS exposure to children living in homes with guardians who smoke. Towards this aim, we developed the infrastructure of the components that was coded into the Alexa skill program and investigated the capabilities of the air particle detection system (Awair device) to best integrate it into the Alexa program. Furthermore, a skill map was designed to outline the progress of our development which also allowed the development of the Alexa skill to be understood by a wider audience. After the design and development of the Amazon Alexa and Awair Air Quality devices, we helped create a participant survey that will be used to assess participant feasibility. We expect the participants to be able to easily engage with the devices and successfully be aware of their smoking behavior. Overall, the success of our devices will allow participants to create a cleaner environment for both their own health and the health of their children.

**46. *A Data-Driven Approach to Mood Classification and Neurofeedback***

**Presenter(s):** Emma Chen, Victoria Caldera, Natalie Richardi, Jake Gavenas

**Advisor(s):** Elnaz Lashgari

The current standard of care for depression consists of antidepressant medication coupled with psychotherapy. However, critical shortcomings with this route (e.g., variable efficacy, adverse side effects, and treatment-resistant depression) indicate a need for alternative treatment methods. Neurofeedback is a type of therapy in which patients learn to regulate their brain activity by way of real-time external feedback, and has previously been used for depression treatment (e.g. Choi et al., 2011). Unlike previous studies, however, we adopt a data-driven approach, using machine-learning to identify ideal neural regulation targets for each individual based on their own brain activity. We first record electroencephalography (EEG) from a mood-induction paradigm, then train machine-learning algorithms to decode each participant's mood. Then, we will bring subjects back and give real-time external feedback based on personalized algorithms, allowing subjects to regulate brain activity underlying their mood. Here, we demonstrate the efficacy of classifying mood from EEG, a critical first step for this project.



## **Sociology**

### **47. *Asian Food and American Racism***

**Presenter(s):** Melissa Glover, Kanako Monsen, Colette Tagayun, Arvind Mudaliar

**Advisor(s):** Dr. Stephanie Takaragawa

This project is part of FFC: Yellow Peril to Yellow Power, that critically examines Asian American history, culture, and identity. This project is an exploration of the relationship between the styling of food and racism, mainly through the lense of Asian American culture and the United States. Main topics include issues such as both americanization and orientalization of traditional Asian foods. American culture and restaurants tend to portray a pan-ethnic representation of all Asian countries and their food, creating harmful stereotypes and generalizations surrounding Asian culture. Many restaurants in the United States present themselves as making authentic Asian cuisine, but fail to fully address the differences between the countries of which the food originated from. Oftentimes, there are very few chefs and employees that actually are the nationality the restaurant claims to represent. On top of this, many of these same restaurants use stereotypically 'Asian' decorations that fail to actually represent Asian culture, such as awkwardly placed banners, lanterns, and sacreligious Buddha statues. Restaurants tend to use "exotic" spices and ingredients to lure in more customers, even when they are not part of the traditional recipes. They lazily feign authenticity, which inevitably has the opposite effect on many potential Asian customers, and reifies misconstrued representations of Asian cuisine and culture to non-Asian customers. This project aims to better understand how the presentation of food can fuel harmful stereotypes in our society.

## **Theatre**

### **48. *How Color Psychology Informs the Emotionality of Live Entertainment***

**Presenter(s):** Camille Roberts

**Advisor(s):** Dr. Jocelyn Buckner

Color psychology is an integral part of our lives that interweaves through most of our subconscious decisions—whether we know of our own personal color associations consciously or not, people tend to gravitate toward colors that prompt certain emotional reactions. Further, differing colors can signal different things when we perceive them. For example, a deep purple, velvet robe gives a strong sense of regality and poise, whereas a red robe of the same fabric portrays a more daring, aggressive personality. While every individual has personal preferences and experiences that make them process certain colors with different meanings and significances, general color associations are a function of social learning and are thus a widespread way to access subconscious messaging. By understanding how color psychology impacts subconscious processing, lighting designers can make more informed choices in their designs and implement the message of a production with greater success. In order to garner a deeper understanding of color psychology, I will be researching the science of color psychology and human perception, pulling from my own experience to realize why I made certain creative choices, and attempting to implement the knowledge I have learned in a comparative example. Understanding the psychology behind color choices is crucial in the field of lighting design; by knowing the subconscious expectations humans hold for certain colors, designers can choose to heighten the tension in a scene, to drown the stage in a specific vibrant color, or to completely desaturate the look. This—combined with the emotionality of the actors' performances, the directional vision, and the text itself—creates poignant scenes that can stay with audience members long after the show has ended, and has the potential to greatly impact viewers' perceptions on their own life.

**ROOM A**

**Biochemistry and Molecular Biology**

1:00-1:20pm

***Mechanism and Chemoselectivity for HOBr-Mediated Oxidation of Zinc-Bound Thiolates***

**Presenter(s):** Alexandros Drivas

**Advisor(s):** Dr. Maduka Ogba

Zinc-thiolate complexes play a central role in bacterial defense against persistent “oxidative bursts” of reactive oxygen species by animal hosts, of which hypohalous (HOX) acids are one of the most potent. A multidisciplinary effort is underway to understand these bacterial redox sensing mechanisms and consequently, develop novel therapeutics for diseases of chronic inflammation. Recent quantum mechanical calculations by us reveal that the preferred mechanism and chemoselectivity for HOCl-mediated oxidation of zinc-bound thiolates is governed by minimizing geometric strain at the zinc-thiolate active site. However, the robustness of the reported reactivity and selectivity models against other biological oxidants is not known. In this project, we investigate the redox-sensing mechanism with two other biologically-relevant hypohalous acids – HOBr and HOSCN – using the identical zinc-thiolate complex and compare with that of HOCl. Our current findings on the reaction pathway for the HOBr-mediated process will be disclosed, and emerging trends with respect to general HOX-sensing by zinc-bound thiolates will be discussed.

**Chemistry**

1:20-1:40pm

***Computational Investigation Into the Origins of Reactivity for Metal-Thiolate Complexes that Activate of H-E bonds.***

**Presenter(s):** Joshua Oommen, Zach Nelson

**Advisor(s):** Dr. Maduka Ogba

Within the last decade, experimentalists have attempted to mimic the heterolytic bond cleavage of H-H bonds by [NiFe] hydrogenases by constructing synthetic metal-thiolate complexes using various transition metals for its potential applications in industrial reduction chemistry and alternative fuel sources. In their seminal work in 2008, Stradiotto and colleagues synthesized an iridium (III) and a rhodium (III) thiolate complex that was used for the successful cleavage of silane (Si-H) bonds, facilitating the hydrosilylation of ketones. Experiments reveal that stoichiometric amounts of the iridium (III) complex were needed for this transformation, while catalytic amounts were achieved for the rhodium (III) analog. The mechanism for the reactions using both metal-thiolate complexes and the origins of differing reactivity between the complexes have not been explored. Our research goal is to use quantum mechanical computations to (i) elucidate the plausible mechanism(s) for Si-H activation mediated by both metal-thiolate complexes, and (ii) uncover the factors affecting the difference in reactivity between these complexes i.e., stoichiometric for iridium(iii), catalytic for rhodium(iii). Furthermore, experimental attempts to heterolytically cleave dihydrogen (H-H) using these complexes failed, and results from our work will serve as a launch point for

## Oral Presentations - Session II

### Wednesday, December 2 | 1:00PM-2:00PM

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designing metal-thiolate variants for this important transformation. In this presentation, we will present the computed ground state complexes along the reaction pathway toward the hydrosilylation of acetophenone using both iridium (III), rhodium (III), and cobalt (III) metal thiolate complexes, and present our validation analysis with existing crystal structures. Our current hypothesis for the differing reactivity based on the ground state complexes will be discussed.

**1:40-2:00pm**

#### ***Computational Investigation of Ca(NTf<sub>2</sub>)<sub>2</sub> Mediated Sulfur (VI) Fluoride Activation and Factors Precluding Catalytic Turnover***

**Presenter(s):** Brian Han

**Advisor(s):** Dr. Maduka Ogba

Nitrogen-containing sulfur(VI) compounds are commonly used in the pharmaceutical industry to combat bacterial infections. Synthesis of these compounds is typically facilitated by nucleophilic attack of a sulfur(VI) chloride pre-cursor by an amine nucleophile. However, the relative instability of sulfur(VI) chlorides makes selective synthesis challenging in the presence of competing nucleophiles, and hence precludes late-stage functionalization of complex natural products. Sulfur(VI) fluorides have become an attractive alternative to the chloride analogs given the increased selectivity that can be achieved with these precursors. Our collaborators succeeded in synthesizing nitrogen-containing sulfur(VI) compounds under mild condition using a myriad of sulfur(VI) fluorides in the presence of amine nucleophile, mediated by calcium triflimide – Ca(NTf<sub>2</sub>)<sub>2</sub>. This contrasts conventional methods where strong base/nucleophiles with elongated heating process were required. However, the mechanism for sulfur(VI)-fluoride activation using Ca(NTf<sub>2</sub>)<sub>2</sub> is not known, and in most cases, stoichiometric calcium triflimide is required for the transformation. Furthermore, the duration of reaction and yields of sulfonamide vary depending on the solvent. In my research project, we used quantum mechanical approach to shed light on the reaction mechanism for Ca(NTf<sub>2</sub>)<sub>2</sub>-mediated sulfonyl-fluoride activation and elucidate the factors preventing catalytic turnover of Ca(NTf<sub>2</sub>)<sub>2</sub>, specifically, in both polar protic and aprotic solvent. We present (i) the minimum energy structures at each state of the reaction and (ii) data supporting our current product-inhibition hypothesis precluding the regeneration the pre-activation Ca<sup>2+</sup> complexes required for catalytic turnover.

## ROOM B

### Political Science

**1:00-1:20pm**

#### ***The Fear Factor: News Media Consumption on the Fear of Being a Victim to a Racial or Hate Crime***

**Presenter(s):** Lieu Madayag

**Advisor(s):** Dr. Ann Gordon

This paper will explore the correlation between news media consumption and the fear of becoming a victim of a racial or hate crime. Dramatizing the contextualization behind violent crimes has become

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extremely prominent within the daily news media. This topic is important when studying American politics because although there have been several statistics that have reported a decrease in violent crime, the amount of news sources and channels centralizing their broadcasts and publications around violent crimes has been steadily increasing throughout the United States. This paper seeks to explore the role that the media has in shaping viewers' fear of being a victim to a racial or hate crime by hypothesizing that the more time a respondent consumes news media on a daily basis, the more likely that respondent will have a fear of being a victim to a racial or hate crime. It has also been important to consider the effects of the news media on the fear of crime victimization based on the different types of media platforms a respondent consumes. Social media and traditional forms of news media have different objectives when disseminating information to audience members, and this paper will also explore the relationship between social media platforms versus traditional media sources in influencing the fear of being a victim of a racial or hate crime. Other works of literature have argued that the geographic location and the conditions within a neighborhood, particularly known as neighborhood effects, have a strong influence on an individual's fear of crime. This paper extends its study by hypothesizing that the media's role in cultivating racial or hate crimes in the southern region of the United States has influenced a stronger fear of being racially or hatefully victimized within that particular region of the nation.

**1:20-1:40pm**

#### ***Changes in Public Opinion on Queer Issues***

**Presenter(s):** Hunter Jowell

**Advisor(s):** Dr. Ann Gordon

Since President Trump's victory in the 2016 presidential election, political polarization as grown within the United States, especially related to LGBTQ+ rights. Simultaneously, LGBTQ+ rights have continued to be a priority for many left-leaning voters. According to contact theory, personal relationships with LGBTQ+ people results in greater acceptance of these individuals, thus in a post-Obergefell v Hodges era, the outness of queer individuals has continued to increase and it is more likely that voters know someone who is a member of the LGBTQ+ community. This paper analyzes the shift in public opinion related to LGBTQ+ issues, with emphasis on transgender issues, between 2016 and 2020. Using the ANES 2016, 2018, and 2020 data sets, this research analyzes demographic relationships, such as party identity, age, geographic location, and relationship to LGBTQ+ individuals, to opinions on transgender people, their rights, and other LGBTQ+ issues to determine how shifts in opinion have manifested in the electorate throughout a politically polarizing timespan. One interesting finding suggests age does not play a significant role in determining whether a respondent feeling warmly about trans people, instead, a respondent's willingness to harm a democrat is more informative. That is, respondents who are more willing to commit violence against democrats are more likely to view trans people as unfavorable. This research provides an important contribution to the body of literature by emphasizing trans issues in public opinion over a course of four years which may permit for future research to explore the president's personal influence on this subject.

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**1:40-2:00pm**

#### ***Conspiracy Theories in the Age of Social Media***

**Presenter(s):** Annalysse Santos

**Advisor(s):** Dr. Ann Gordon

As social media has become increasingly prevalent in recent years, it has led to an increased accessibility to news. Social media acts as a means for individuals to emerge themselves in an echo chamber and discover conspiracy theories that fit their current beliefs. My findings indicate that a conspiratorial mindset is linked to mistrust in government and lower participation in the political process due to a feeling of powerlessness and anxiety. In addition, the increased use of social media as a news source is attributed to the declining trust in traditional news media. Social media enables individuals to comprehend complex political and social events, such as an assassination, and rid oneself of such powerlessness. By utilizing the Chapman University Survey of American Fears, Wave V, I will be analyzing the effects of gathering one's news from social media, education, and race on the government concealment of conspiracy theories, regarding the 9/11 attacks, the JFK assassination, and the Illuminati. As current research focuses on more recent conspiracy theories, such as 5G and COVID-19, and their origin on social media platforms, I will focus on older conspiracy theories, whereas research is outdated, that have gained traction on social media. I will be examining the factors that exist in deciding to believe in conspiracy theories that may have been disproven in the midst of increased access to information. Thus, I will be testing three hypotheses. Hypothesis one states that the greater the usage of social media then the greater the belief in conspiracy theories, specifically ones regarding 9/11, The Illuminati, and the JFK assassination and hypothesis two states that the less the level of educational attainment, then the greater belief in conspiracy theories, and hypothesis three states that if one belongs to a racial minority, then the greater the belief in conspiracy theories. This study sheds light on the conspiratorial mindset of the American people that has infiltrated the minds of politicians and citizens alike and threatens the safety of our society.

## ROOM C

### Political Science

**1:00-1:20pm**

#### ***Growing Prevalence of Political Conspiracies***

**Presenter(s):** Tucker DelPonti

**Advisor(s):** Dr. Ann Gordon

Throughout the course of the 21st century, politicians have become less concerned about facts and rather focus on spewing misinformation to unite their supporters against the political opposition. The ultimate goal of this paper is to analyze how an individual's party identification leads that individual to be more likely to believe conspiracy theories, and subsequently how the voting block's belief in conspiracy theories can affect political processes. With the growing prevalence of conspiracy theories in the political realm, the electorate is having a difficult time differentiating between fact and fiction. This paper will further examine and analyze why political conspiracy theories became more prevalent in the 21st century in addition to the affect these conspiracies have on the voting population. The ANES 2020 survey data will be used to collect data about the party identification and belief in conspiracy theories between Democrats

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and Republicans. Additionally, this paper will examine the possible relationship between an individual's lack of belief in science and a higher prevalence to believe conspiracy theories to further understand how misinformation can substantially impact partisan values and beliefs. Using the psychological concept of the "in/out" theory I expect to find a higher prevalence of Republicans believing in conspiracy theories because President Trump has propagated a plethora of conspiracy theories as part of the "in" political group. My research has already yielded interesting findings regarding the frequency of belief in conspiracy theories within Republican Party identifiers, which will help fill out the existing literature on the impact of conspiracy theories in American politics.

**1:20-1:40pm**

#### ***Increasing Turn-Out of Young Voters***

**Presenter(s):** Katie Agrela

**Advisor(s):** Dr. Ann Gordon

One of the chief issues facing democratic elections in the United States is voter turnout. Young people are considered to be apathetic to political issues and avoid participating in elections. This paper will examine tactics to increase turnout amongst the younger generation. There is a belief that voters age into caring about politics, but a large part of the voting population is in the eighteen to twenty-four age bracket. Young voters are faced with voter suppression tactics that make it difficult to register to vote. In order to devise the best tactics to encourage mobilization, voter turnout trends must be examined. The elections of 2016 and 2018 are the most recent sample and will help illuminate the most recent voting trends. It is important to examine election years with record-high years of turnout, as well as low. Pinpointing the concerns of young people will also be necessary to increase their political participation. Young people also have unique modes of communication that are imperative to reaching the largest number. This paper will utilize the American National Election Survey from 2016, 2018, and 2020. It is necessary to examine the variables that could contribute to voter turnout, especially among the eighteen to twenty-four-year-old demographic.

**1:40-2:00pm**

#### ***Increasing Political Polarization and its Causes***

**Presenter(s):** Cameron Lockard

**Advisor(s):** Dr. Ann Gordon

My current hypothesis is simply that as someone gets older, they become increasingly more politically polarized. By this, I mean that an individual will become more strongly aligned with their political affiliation the older that individual gets. This could be caused by numerous factors, many of which I wish to identify in this study. In attempting to find these additional independent variables, I will be using the life cycle effects theoretical framework, and I will utilize data from the 2016 National Election Study. The goal of my study is to determine what causes someone to vote one way or another during an election. With political polarization seemingly at an all time high, it seems appropriate to determine the factors impacting political affiliation during the 2016 presidential election. My dependent variable would be how the respondent rates themselves on a scale from "extremely liberal" all the way to the other side of "extremely conservative". One independent variable that I am using is the respondent's age group. By

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adding additional variables, I hope to not only find what causes someone to be more strongly right or left leaning, but what single variable is the most significant in determining one's strength of political affiliation. Among the interesting findings so far in my research, I have found that age does seem to have a correlation with how strongly an individual identifies as conservative, but the same cannot be said for liberals. This paper concludes with a discussion of the implications of the study for other factors that could cause people to be more strongly affiliated to a political ideology and how the information could be used for future elections.

### ROOM D

#### Political Science

**1:00-1:20pm**

***Vulnerable to Murder***

**Presenter(s):** Madi Rosenson

**Advisor(s):** Dr. Ann Gordon

In this research I will be acknowledging the fear of falling victim to murder in the United States of America. To go even more in depth, I will be comparing the fear of being murdered by a stranger and the fear of being murdered by someone you know. I will be discussing which is more likely to happen – being murdered by a stranger or someone you know – and the possible independent variables that make an individual feel vulnerable to this situation. For example, data from the FEAR survey found that female respondents recorded fearing being murdered by someone they know and being murdered by a stranger more than the male respondents. Using the vulnerability theory will help determine whether people more vulnerable to victimization have higher levels of fear recorded by the FEAR survey. To determine who is vulnerable, I will be looking at statistics reported by the FBI and other sources to conclude which gender, race, and age are more likely to be victimized to compare to patterns of fear in order to determine if the fears are realistic based on the risks. After comparing statistics from the FBI and other sources to the data found in the FEAR survey, the categories of gender, race, and age will be further broken down to see if reading a local newspaper, reading a national newspaper, watching the national nightly news, or getting news from social media influence fear. I expect this paper to make the scholarly contribution of addressing the risk factors and demographics of murder victimization as compared to the levels of fear. I also expect for this paper to outline the statistics for murder victimization by someone you know and murder victimization by a stranger and to dispel some of the misinformation that may increase fear and vulnerability perception.

**1:20-1:40pm**

***The Lasting Effects Police Brutality has Left on Black Americans***

**Presenter(s):** Gabriella Corsino

**Advisor(s):** Dr. Ann Gordon

Black Americans have been marginalized for as long as our country has been established. Systemic racism has engendered a Police Brutality Crisis in our broken nation. Innocent black Americans are being

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slaughtered for no reason other than the color of their skin. Police Brutality has left long-lasting negative effects on black Americans, including the lost lives of loved ones, fear, anger, PTSD, anxiety and depression. No matter if you are a man, a woman, a transgender individual, a child, if you grew up in the north or the south, east or the west, a city or a suburb, all black Americans endure the same systemic racism which puts them at risk for experiencing these harmful effects. In this study, the Survey of American Fears will be used to compare the dependent variable (How afraid are you of being the victim of the following crimes? Police brutality) to the independent variable (Black Non-Hispanics and Black Hispanics) across all ages, genders and geographical locations.

**1:40-2:00pm**

***Blues Versus Reds: A Better Measure of What Keeps Us Apart in Order to Understand How to Bring Us Together.***

**Presenter(s):** Marit Aurin

**Advisor(s):** Dr. Ann Gordon

Media is at the center of politics, culture, and even the formation of identity. The media and its massive influence, however, poses risks when its sources and perspectives lose diversity. In our current era of polarization and contrasting information, many accuse media outlets and their massive influence of being perpetrators of selective narratives, which lead to national fragmentation. In fact, results can inform that the proliferation of media choices may play a large part in the polarization of the news audience (Iyengar and Hahn, 2009). The relationship between media consumption and people's attitudes towards polarizing topics will be analyzed to determine whether or not the media stereotypes associated with partisanship hold any truth. In particular, we study two groups based on FOX News and CNN consumption. These two groups are then compared on stereotypically partisan topics such as illegal immigration and climate change using data from the 2018 Chapman University Survey on American Fears. Expected results are that an increased consumption of CNN is related to predicted liberal stereotype values and an increased consumption of FOX News is related to predicted conservative stereotype values, thus leading to further polarization. For instance, this paper finds that those who watch FOX News daily are almost 3 times more likely to strongly agree that police should be allowed to raid businesses and homes in order to find undocumented workers than those who watch CNN daily. This tendency to select news based on values can be explained through the phenomenon of confirmation bias, as well as echo chambers and epistemic bubbles. The results supporting partisan belief by choice of media further confirms the difficult problem that lies ahead to unify the country under shared values.



**ROOM E**

**Political Science**

**1:00-1:20pm**

***Gender and Voting Behavior***

**Presenter(s):** Emma Charles

**Advisor(s):** Dr. Ann Gordon

The topic of my research paper will be researching women and voting behavior. In the survey on voting behavior I will look at how gender affects voting behavior and if women will vote. I will also try to identify how race, class, socioeconomic status, location and other factors affect how women vote and look at the “gender gap” and if it affects elections. The gender gap is widely reported in certain elections and not as much in others so in my research of looking at women’s voting behavior and how likely they are to vote, I will examine to see if the gender gap is a myth made up by the media. In my articles so far, I have looked at how the women’s right to vote has changed the economy, if there is a gender gap and how the media plays it up, and how black women have more distrust of the government than black men but are still more likely to vote. The majority of my research will look at women and their tendencies in voting in United States elections. In order to accomplish my research, I will look at each factor that could play an impact in a woman's choice to vote and how she votes. I will see if women tend to vote together or if it is split. My work will contribute to the literature because it provides key information on why women vote differently from men. These findings will be important because they help us understand how and why people vote the way they do.

**1:20-1:40pm**

***Age, Politicization, and Climate Change***

**Presenter(s):** Kealani Tanizaki-Hudson

**Advisor(s):** Dr. Ann Gordon

Climate change is taking a strategic position in international and national politics worldwide. The current emergence of climate change effects has reached an international high within the last two decades. This paper will explore the relationship between beliefs on climate change, partisanship, and age. This paper will also investigate the role of partisan group identity influencing the science behind climate change's politicization. Relying on the Chapman University Survey of American Fears, a nationally representative sample, this study will explore the correlation between the fear of climate and both demographic and social-psychological variables. Two themes identified include: (1) the demand for unbiased political and social change focusing on the climate emergency, and (2) identifying defensive resistance including political leaders, older generations, and capitalist ideologies. The paper will conclude with a discussion of how party identification affects how climate change is perceived and why scientific information is understood differently, from person to person.

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**1:40-2:00pm**

#### ***The Vote-by-Mail Dilemma***

**Presenter(s):** Hawk Ohannessian

**Advisor(s):** Dr. Ann Gordon

Mail-in ballots and voting-by-mail ballots have been a significant topic of discussion for many years. The Covid-19 pandemic and the current situation of the United States has exacerbated and intensified this argument for and against the vote-by-mail system from Democrats and Republicans alike. Liberals have argued saying the lack of a national vote-by mail system is voter suppression and does not let many people, that do not have an opportunity to vote on election day, especially with the Coronavirus, have an alternate way of voting, and they also argue that it is safe and convenient. Conservatives have argued against voting-by-mail stating that it is fraudulent and does not authentically reflect the voices of the American people. Can a good vote-by-mail system exist to allow for more convenient voting schedules for Americans while having fair elections with authentic and verified ballots that correctly associate with an eligible American voter? Does the independent American voter, observing from an objective point of view, care about these arguments, however? If all Americans were universally offered the option to vote by mail would they vote-by-mail over voting in person? It is possible the issue is a verification processing issue and if a proper verification system is implemented, vote-by-mail can better serve the American people. Data regarding party affiliation and frequency of voting-by-mail, voter turnout, arguments of voter fraud, and arguments of the benefits of voting-by-mail, public statements made by major party officials and other bureaucratic and government officials as well, and documented successes of using voting-by-mail in previous elections will all be examined. When offered the option of voting by mail, the independent American, will take advantage of the opportunity because of the benefits offered.

## **ROOM F**

### **Political Science**

**1:00-1:20pm**

#### ***Examining The Relationship Between American's Voting Behaviors And The Fear Of Being Fooled By "Fake" News On Social Media***

**Presenter(s):** Hannah Slagle

**Advisor(s):** Dr. Ann Gordon

The age of evolving technology and media has created a new way for news to be shared regarding political issues or presidential election candidates. With this evolution, the appearance of false or "fake" news and media has emerged and it has only gotten more difficult over the years to spot these discrepancies. According to Chapman University's Survey of American Fears Wave 5, 17.1% of Americans reported that they were fearful of being fooled by "fake news". Though this statistic is not drastically high, it will rise in the coming years as the media continues to evolve. Americans have access to information regarding the election at their fingertips, but the difference in media sources can cause inconsistency among news sources. Television, radio, podcast and social media are all examples of media sources from where voters can access news and information regarding the election, however Americans have their pick of media in which they trust the most. The following research will examine how media consumption patterns and

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other variables impact how likely Americans are to believe in fake news. There is no clear relationship between American voter's political beliefs and the various levels that one might fear "fake" news, which is why this research will reach far beyond to identify any relationships that might be held between these variables. It will look at political party loyalty, political social issues, and more.

**1:20-1:40pm**

#### ***Social Media and Partisan Polarization***

**Presenter(s):** Aarushi Bhaskaran

**Advisor(s):** Dr. Ann Gordon

Social media is a key factor that contributes to growing political polarization, particularly in the United States. The objective of this study is to understand how platforms of social media reinforce political ideology and effect political polarization of the general public. The phenomenon of changing one's political beliefs to fit partisan division is also a potential factor in the effect of media exposure on "obstinate partisanship," a term identified in previous research to describe unwavering loyalty to a party regardless of its performance. Previous research has been conducted discussing certain aspects of the effect of media on partisanship and political polarization. Other literature on the subject adopt the "echo chamber" lens to social media discourse, finding it to be conducive to partisan polarization. This paper aims to add to the existing discourse on the matter of media effects on political polarization, with an emphasis on social media, employing data from the 2020 American National Election Studies survey to gauge to what extent the trend of obstinate partisanship has continued or accelerated. The study addresses the social media habits of Facebook and Twitter users in conjunction to their strength of partisanship. Across both, this study finds a positive correlation between the frequency of Facebook or Twitter usage and the strength of partisanship. However, this study also aims to identify which social media platforms, not limited to the two mentioned above, are linked to strong or weak partisanship. As there is little available information on newer social media platforms such as Tik Tok and SnapChat, this study addresses these platforms' roles in fostering partisan polarization, as well as partisans' preferences of platforms. The study will use new data to better understand the existing trends in social media's impact on partisanship and to include newer social media platforms in discourse around the topic.

**1:40-2:00pm**

#### ***Voter Opinion on the Expansion of Government-Funded Healthcare***

**Presenter(s):** Jacob Harris

**Advisor(s):** Dr. Ann Gordon

The Affordable Care Act (ACA) created in 2010, was enacted to lower healthcare costs and help improve the quality of life for those who were unable to otherwise receive medical insurance. The ACA has created a variety of political opinions about expanding, replacing, or repealing the policy that was signed into law in 2010. Public opinion about government health care policy is subjective to personal values, ideologies, worries, and connections to political party affiliation. Traditionally, democrats are more likely to support a government-funded healthcare option than republicans. Additionally, people who are committed to societal equality and/or the rational economic approach are more likely to be in favor of a fully

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government-funded healthcare system. This paper will explore and identify the root causes of voter opinion by looking at public support of, or the opposition of a government-funded health care system. It will also examine the individual emotions towards medical conditions and healthcare, health patterns, and age of voters, to assess their tolerance for government-funded healthcare. The data for this research was obtained from the American National Election Service (ANES) 2019 and 2020 questionnaire. Data was also obtained from the Chapman University Survey on American fears.

### ROOM G

#### Political Science

**1:00-1:20pm**

##### ***Fear of Immigration***

**Presenter(s):** Joselyn Rivera

**Advisor(s):** Dr. Ann Gordon

The topic of immigration has been brought multiple times within the last year. This research seeks to answer what influences someone's fear of immigration. Specifically, the research looks at how someone's age, sex, education level, income, state of residency and zip code, religion, and political identification influences how they view immigration. The research will utilize data from the American National Election Studies Survey and the American Fears Survey to conduct the research. In order to prove the hypothesis, the surveys and variables are being cross-examined. My literature review helped me form the hypothesis, which is what will be proved with this research. I hope to prove that younger people are less likely to fear immigration than those who are older. Additionally, if someone is a female, they are least likely to fear immigration than those who identify as males. Also, if someone is religious, then they are approving of immigration. When it comes to the income variable, the hypothesis is: If someone has a lower income, they are more likely to oppose immigration. If someone lives in a rural area, they are most likely not in favor of immigration. The last hypothesis is that if someone has pursued higher education, they are more likely to approve of immigration.

#### Environmental Science and Policy

**1:20-1:40pm**

##### ***Assessing Impacts on Natural Disaster Preparedness***

**Presenter(s):** Angie Wong

**Advisor(s):** Dr. Ann Gordon

This paper explores the study of whether income level influences one's fear of natural disasters, and the impact it has on the person's preparedness for natural disasters. It will also look at whether income level or fear will influence a person's preparedness for a natural disaster more. This study has two independent variables, income level and fear of natural disasters. For this study, I will be using the American Fears Survey to conduct my research. Natural disasters cannot be prevented but this study will show how people will react to their fear of natural disasters, do they push it away or do they take it in and prepare themselves? I hypothesize that those with a lower income will fear natural disasters more than the other.

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I also hypothesize that those with a lower income will be more prepared for a natural disaster. Furthermore, I hypothesize that those who fear natural disasters more will be more prepared for a natural disaster. Among my findings, the Extended Parallel Model (EPPM) is a key theme in whether people are usually prepared for a natural disaster. By looking at the EPPM, I will interpret how people react when confronted with their fear, whether they will confront their fear by preparing for it or by pushing it away.

## ROOM H

### English

**1:00-1:20pm**

***Nailbeds as a Text for Revised Masculinity***

**Presenter(s):** Natalie Green

**Advisor(s):** Dr. Jan Osborn

Discourse regarding concepts of the feminine and the masculine plays an important role in ideologies of gender. Using Bordo's theory of the body as inscribed with ideological constructions, I analyze the ideological framework of masculine/feminine Discourse. This study focuses, particularly, on the discourse regarding heterosexual men painting their nails. The artifacts for analysis include photographs and articles from contemporary fashion sites, such as Vogue and CR Fashion Book. The analysis demonstrates that what has traditionally been a marker of femininity is being accepted by heterosexual men, resulting in a rhetoric stemming from the act of straight men painting their nails, one that breaks from the long-held standards of what it 'means to be a man.' A transformation is taking place, one changing the current societal ideologies and allowing the masculine to accept the feminine.

**1:20-1:40pm**

***Electoral Literature as Examination of Overarching Rhetorical Exigency***

**Presenter(s):** Saif Khan

**Advisor(s):** Dr. Jan Osborn

I would first like to disclaim that this study offers no support or otherwise toward particular political stances or ideologies. [Rather, it is an exploration of whether any stances and the actionable privileges of citizens to champion them are derived from an ethical and sound application of rhetoric; and further, to determine if such an application is at all possible within a political context and beyond.] Rhetorical theorist Lloyd Bitzer was the first to examine what he labeled as the "rhetorical situation" in its entirety. Bitzer's framework, which I will use as the primary methodology for this project, defined an explicit rhetorical purpose and the components that comprise a rhetorical situation. Using these definitions as standard, rhetorical practices that fail to fulfill them will be labeled as unethical. The rhetorical artifact I have selected to ground my investigation is the local Voter Information Guide and Ballot of my county. These texts will be used to illustrate how political rhetoric, in the form of electoral literature, fails to lend itself to rhetorical goals and function in a rhetorical situation, thereby becoming unethical. The guide and ballot will reveal this through inadequacies such as pre-discourse alteration of reality and ignorance toward the multiplicity of complex contemporary rhetorical situations. My expected findings are not solely based on the negation of political rhetoric as ethical, but hopefully on reaching conclusions of how to alleviate self-

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contradiction, selective application of ethics, and issues of multiplicity in the entire field. I aim to offer a new lens that encourages analysis of the rhetorical situation of rhetoric and to question why the endemic exigency has been overlooked and not offered definitional urgency. Bitzer himself claimed that the rhetorical situation is the source of not only rhetorical activity but criticism.

### Writing And Production

1:40-2:00pm

***“No Punch Girl” Graphic Novel Project: Satirically Exploring Themes of Non-Violence in the Action Genre***

**Presenter(s):** Isabella Miller

**Advisor(s):** Tom McLoughlin

I created my satirical graphic novel No Punch Girl in order to explore my questions about how non-violent themes and messages are so often advocated in the action genre despite the fact that this media exists to glorify and showcase fighting for audience entertainment. This seeming paradox is at the core of the action genre universally, appearing internationally in both eastern and western media from superhero movies and spy thrillers to martial arts films and anime. By first filling over 100 notebook pages with comic-style paneling and then digitally sharing them over the internet for my small pool of readers, I was able to generate my own original story over the past three months. No Punch Girl is the story of Jen, a young girl fixated on the glory of street fights and martial arts. Her extremely-pacifist family disapproves of this interest and refuses to let her learn, so she takes finding a mentor into her own hands. My oral presentation encompasses a reflection on my graphic novel project and invites the audience to ask deeper questions about trends in the action genre as a whole.

### ROOM J

### Communication Studies

1:00-1:20pm

***Exploring Sexual, Romantic, and Platonic Functions of the Imagined Interactions Framework***

**Presenter(s):** Steele Viverette

**Advisor(s):** Dr. Megan Vendemia

Imagined interactions (IIs) involve interpersonal contact with another individual within one’s mind (Honeycutt, 2003, 2015, 2020). Although primary functions and features of IIs are well-established in the communication literature (Honeycutt, 1989, Vickery, 2019), the present study sought to uncover additional functions related to sexual encounters, particularly with ostensible strangers during the COVID-19 pandemic. The world is becoming increasingly digitized, resulting in an augmentation in the amount of our social interactions that are conducted online; this trend toward digitization is especially apparent during the COVID-19 pandemic with recommendations for physical distance from others. It should follow that these online interactions, too, should have implications for the interactions that play out in our minds. The increasing popularity of online dating websites and applications (apps), such as Tinder and Bumble,

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shifts even the most intimate interactions into an online setting and possibly introduces understudied features of IIs. Expanding upon prior research, the present study explores the role that IIs may play in this digital shift, particularly in the context of online dating and the COVID-19 pandemic. As part of a larger study investigating online dating during the COVID-19 pandemic, we asked 315 online daters in the United States to describe their recent IIs with someone they recently matched with on an online dating platform. Through a qualitative coding process, six key themes emerged from their responses: imagined interactions as sexual pleasure and sexual release; imagining plans that lead to sexual interaction; planning for future cybersex; imagining first date scenarios; compensation for in-person platonic interaction; and the inability to have IIs. Implications for online partners who have not met offline, online dating experiences during the COVID-19 pandemic, and the literature on IIs are addressed in this research.

### **Interdisciplinary**

#### **\*Abstract Withdrawn**

#### ***Comparative Education and “Nordic Exceptionalism”: Correlation between the Happiest Countries and Top-Scoring Students***

**Presenter(s):** Sophia Crawford

**Advisor(s):** Kendra Day

The 2020 World Happiness Report ranked all the Nordic countries (Finland, Denmark, Norway, Sweden, and Iceland) in the top 7 spots for average citizen happiness. The US is 19th. The report’s chapter titled “The Nordic Exceptionalism” explains how they use factors such as political rights, degree of corruption, trust among citizens, income distribution, crime rate, social cohesion, gender equality, and others to determine international rankings. Now, the PISA (Programme for International Student Assessment) examinations evaluate the academic performance of 15-year-olds across 156 countries every 3 years. Every PISA study reveals that Nordic countries generally perform better than the US, and specifically Finland consistently outranks the US. There’s plenty of resources that discuss the topic of Swedish education, Finnish cultural happiness, and the prosperous Norwegian economy prioritizing its citizens, but few academic articles have discussed this topic in depth. Academic research thoroughly exploring how the education systems compare is very difficult to come across and are vague in their conclusions. Using fields such as Economics, Psychology, and Educational studies, this paper will attempt to discover how and whether the US should adopt and the Nordic education system, and possibly their social welfare as well for the betterment of education.

### **Sociology**

**1:20-1:40pm**

#### ***Me Too: Gone Global***

**Presenter(s):** Sule Murray

**Advisor(s):** Dr. Ian Barnard

The Me Too movement is a social movement against all forms of sexual harassment and abuse, especially at the hands of wealthy renowned influential men. According to Burke (and later Me Too activists), the purpose of Me Too is to act as a support network to empower women through empathy and solidarity,

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partially by publicizing allegations of sexual misconduct to visibly expose the vast amount of women who have survived sexual assault. Using a combination of images, infographics, and videos, this presentation will analyze the global impact of Me Too and the rhetoric employed by emerging Me Too female activists of color around the world. In my research, I discovered numerous screenshots of Me Too social media posts, news articles, interviews, academic papers, and images of protests around the world. In the latter, there are protest signs using layered rhetoric that prove to be worthy of analysis. Through my analysis, I hope to conclude that while these activists around the world have used language and rhetorical strategies of the Me Too movement to bring global attention to their fight, the subversion-and utilization of-their specific cultural norms, taboos, traditions, and power dynamics have made their rhetoric unique.



## **Biochemistry and Molecular Biology**

**1. *A Computational Investigation of the Molecular Descriptors of Tyrosine Kinase Inhibitors***

**Presenter(s):** Robby Jones

**Advisor(s):** Dr. Maduka Ogba

Drug discovery can cost 0.5 to 2.6 billion dollars and take 10-20 years to develop a single, viable drug for humans. This arduous process necessitates strategies for identifying and mitigating bottlenecks in the timeline. The largest bottleneck, synthesizing and testing drug candidates, is expensive, time-consuming, and there is never a guarantee of a successful compound. The implementation of computational chemistry allows for a cost and time-effective approach, and it minimizes the loss of an unsuccessful compound. In combination with machine learning, new drug candidates can be rapidly identified and preliminarily screened against existing drugs; however, the accuracy of machine-learning algorithms in generating viable drug candidates depends on molecular descriptors gathered via computations. Our group seeks to develop a computational checklist for generating, identifying, and weighing high-accuracy molecular descriptors for machine-learning-based drug discovery. In this presentation, we focus on small-molecule tyrosine kinase inhibitors (TKIs) for Src kinases. Many kinds of cancer occur when Src kinases mutate, so they are an important target in oncogenic treatments. We use high-accuracy quantum mechanical calculations to explore the potential energy conformational space and three-dimensional molecular descriptors of several TKIs that are FDA-approved or in clinical trials. We compare descriptors from the computed conformational space of these drug molecules to those in the bound inhibitors' crystal structures geometry. Our study highlights emerging trends from our data revealing the molecular descriptors that may govern tyrosine kinase inhibition.

## **Biological Sciences**

**2. *Hagfish Egg Adhesion: Hook, Filament, and Sinker***

**Presenter(s):** Zachary Baker

**Advisor(s):** Dr. Douglas Fudge

Hagfish are a group of fish that lack both jaws and vertebral column, and they are known for their slime secretions. Hagfish produce eggs that adhere to one another in a chain via hooks found at the polar ends. The hooks are small filaments of varying lengths that end in clover shaped caps and are surrounded by mucus. The goal of these experiments is to understand the physical mechanisms that govern hagfish egg adhesion. Only one species of hagfish, *Eptatretus stoutii*, was studied in these experiments. Microscopy techniques were used to analyze the shape of each hook and the physical interactions involved in hooking. Tensile strength tests measuring force and extension of filaments were the primary source of experimentation and data collection. These tensile tests were completed using an Instron universal testing machine which can measure the force that develops when a sample is extended or compressed. Single and cyclical trials were run to understand the initial breaking point of the forces applied and the ability for the hooks to reattach after a separation. Initial tests indicated a maximum attachment force of around 0.7 Newtons. Each full separation involved multiple small separations with each separation increasing in force required to separate. Future experiments will be run to determine whether plastic deformations that occur during separation are reversible and allow the eggs to recover their original attachment potential. Future experiments will involve microCT scanning to characterize the three-dimensional shape of the filaments and hooks. Other tensile experiments will be conducted to study the role of orientation when hooking eggs and the role of the mucus in adhesion.

**3. *Uncovering Slime Deployment Mechanisms in Hagfish***

**Presenter(s):** Lucy Chalekian

**Advisor(s):** Dr. Douglas Fudge, Dr. Gaurav Jain, Matthew Snyder, Andrew Lowe, Noah Bressman

Hagfishes are a diverse group of jawless marine fishes that are noteworthy for their ability to produce gill-clogging slime when threatened. The slime exudate ejected by the slime glands is made up of two main components: thread skeins and mucous vesicles. Although the biophysical mechanisms of exudate deployment in seawater are not understood, some details are known. Thread skeins must unravel from their coiled state and provide strength to the slime in the form of a network of silk-like threads. Deployment of mucous vesicles is known to involve the swelling of constituent glycoproteins their subsequent deformation into a vast mucous network that interpenetrates the slime thread network. Recent theoretical work suggests that thread skein unraveling would be greatly enhanced under conditions where the skein (or a loose piece of thread) is pinned to a solid surface. We hypothesize that the slime gland pore remains attached to ejected exudate, and acts as an anchor that allows mucus, and skeins embedded within it, to be loaded in tension, which facilitates unravelling and efficient slime formation. We have employed high-speed camera mounted on an Axio Zoom microscope to observe this process in detail. Data collection was expedited by switching between bright and darkfield to better illuminate certain aspects of the exudate and using a glass slide attached to a spatula to keep the exudate in focus. Our preliminary results suggest that hagfish slime exudate indeed requires an anchor or to be imbedded in mucus for proper skein unraveling and slime formation. This can occur due to shear forces when attached to the slide or during turbulent flow caused by swiping the exudate through the water which generates force and hydrates the mucus in order for the skeins to imbed themselves.

**4. *Mucin Vesicle Hydration in Fresh Exudate***

**Presenter(s):** Anne Kenney

**Advisor(s):** Dr. Douglas Fudge, Dr. Gaurav Jain

Hagfish produce a large quantity of defensive slime when attacked. This slime is a rapid forming dilute hydrogel comprised of two main components, thread filaments and membrane-bound mucin vesicles. Little is known about the behavior of the mucin vesicles immediately after secretion from the slime gland, as all studies on mucin vesicles have used vesicles stabilized with polyvalent anions. The slime is known to form rapidly after secretion, taking between 100-400 ms, however the kinetics of the hydration of the mucus component has not been quantified. In this study we observed and captured the behavior of fresh exudate as soon as it was submerged in artificial sea water. A drop of fresh exudate on a clear slide was rapidly submerged and the resulting behavior of the exudate pluming off and expanding was observed using a high-speed camera in both light and dark field. Focusing on the behaviors of mucin after the initial drop, the dark field showed the shift of the forming mucous gel from opaque to transparent indicating a rapid hydration of the mucin when exposed to adequate liquid. Hydration and formation of the mucous gel occurred before any observed thread unraveling in these experiments, around 50ms, suggesting that when slime is naturally deployed the mucous gel may be the first component to deploy. These insights on the mucin vesicle hydration speed in fresh exudate will further contribute to research involving the mechanisms for hagfish slime formation.

**5. *Can Testosterone Reduce Behavioral Symptoms of Sickness?***

**Presenter(s):** Delilah Schuerman, Aubrey Emmi

**Advisor(s):** Dr. Patricia Lopes, Dr. Brenna Gormally

Research has found that males can suppress behavioral symptoms of sickness (called sickness behaviors) when mating opportunities are available. Because testosterone is often increased in males by female presence and is immunosuppressive, previous researchers hypothesized that testosterone might help suppress sickness symptoms. To examine this possibility, we used a bird species, the Japanese quail, where males decrease testosterone in the presence of females. Lipopolysaccharide (LPS) was used to induce sickness behavior in male birds. We then presented females to these males. We hypothesized that these males would not be able to suppress their sickness behaviors when presented with the females. In addition, a group of males was injected with Gonadotropin-releasing hormone (GnRH), which triggers the pituitary gland to send a message to the gonads to produce testosterone (T). We hypothesized that, due to the increase in testosterone, these males would now be able to suppress sickness behaviors. Behavior was monitored after the injections, and blood samples were taken to quantify T. The behaviors included time spent mounting the female, eating, drinking, and resting and were scored by observers blind to the treatments. The results indicated that birds injected with LPS showed a significant increase in time spent resting relative to saline controls, indicating the injection of LPS successfully mimicked infection. However, a GnRH injection was not able to increase testosterone to the same extent in sick (LPS-treated) birds as it did in control birds. Additionally, no relationship between T levels and resting behavior was found. We conclude that, under an immune challenge, birds are less able to increase T and, therefore, it is unlikely that T modulates the observed decreases in sickness behaviors of males found in previous research. Future research should examine the physiological ability to increase T during disease in other species.

## **Chemistry**

**6. *Designed Hydrogel Microspheres for Management of Thrombosis***

**Presenter(s):** Dela Hatfield, Sanika Pandit

**Advisor(s):** Dr. Andrew Lyon, Molla Islam

The body's ability to manage thrombosis by forming and breaking blood clots is an essential function, and when this is not controlled, many problems can arise. In order to help control blood clotting when the body is unable to, microgels have been designed and finely tuned in order to carry out specific functions such as initiating clotting and breaking down blood clots. Confocal microscopy allows for imaging of microgels in real-time to better understand how simple polymer particles can recapitulate complex biological functions, such as clot formations and clot breakdown. For the application of breaking down blood clots, core-shell-shell pNIPAm-co-AAc (poly(N-isopropylacrylamide)-co-acrylic acid) microgels were synthesized to carry out targeted release of tissue plasminogen activator (tPA). Drug release studies were done with fluorescently labeled dextran as a surrogate for the tPA protein. Microgels were loaded with fluorescently labeled dextran by the breathing in method and imaged in order to determine the rate of release from the particles. In order to address the need for platelets in trauma applications, our group has collaborated with several other groups to create platelet substitutes that we call Platelet-Like-Particles (PLP). Ultra-low crosslinked (ULC) particles were synthesized as a base and then conjugated with Fibrin Fragment E to make PLPs. To visualize how the PLP's interact with a fibrin network, the PLPs were labeled with a dye and then visualized under a confocal microscope. By visualizing the microgel particles and

applying the airy scan technique in the super resolution mode of the confocal microscope, we were able to characterize the particles and get more qualitative and quantitative data about how the particles interact with nascent fibrin clots.

**7. *Fluorescence Lifetime Measurements of Natural Dissolved Organic Matter and Oil Products in Aqueous Solution***

**Presenter(s):** Emma Kocik

**Advisor(s):** Dr. Warren de Bruyn, Dr. Aaron Harrison

The optical properties of chromophoric dissolved organic matter (CDOM), the UV and visible light-absorbing component of dissolved organic matter (DOM), have been used extensively to determine levels, distributions, identify sources, and track transformations of DOM in natural waters. Traditional optical techniques are primarily based on steady-state absorbance and steady-state fluorescence measurements. For example, three-dimensional excitation and emission matrix (EEMs) fluorescence spectra have been used extensively to characterize CDOM in these systems. One of the challenges in interpreting EEMs is that fluorescent material from different sources can fluoresce in the same region. For example, both terrestrial organics and oil products can fluoresce in the protein region of a typical EEM. Time-resolved fluorescence spectroscopy has the potential to differentiate between these different fluorescent materials. We have carried out a series of EEM and fluorescent lifetime measurements on a range of natural dissolved organic water samples and a range of oil products to test the viability of using time-resolved fluorescence spectroscopy to better characterize dissolved organic matter in natural waters. The results show promise with lifetimes of natural dissolved organic material like plant leachates typically less than 10 ns and lifetimes of oil products typically having a lifetime component of greater than 20 ns.

## **Communication Studies**

**8. *Chatbots for Human-Machine Communication***

**Presenter(s):** Dante Amodeo, Liza Antonova, Hannah Berg, Alexandra Callaway, Carolyn Chang, Tiffany Cheng, Caitlyn Combi, Isabella DeAngelo, Alex Drier, Jordan Eisleben, Derek Friedl, Taylor Gallagher, Abby Gikas, Jen Inaba, Jared Kolsut, Kylie Papoosha, Chayla Phelps, Monique Raynaud-loughead, Christine Kelly Salvador, Caroline Sarkani, Jenna Summers, Julia Trudeau, Megan Williams

**Advisor(s):** Dr. Austin Lee

School of Communication students enrolled in Dr. Austin Lee's COM329 Human-Machine Communication developed an innovative conversational agent applicable in various social contexts (e.g., a campus ambassador chatbot, a fitness coach chatbot, a coronavirus information chatbot). The conversational agents can communicate with human users using natural language, possesses domain knowledge, and assist them with specific tasks. In this project, we identify current communication problems, especially in the coronavirus pandemic situation, discuss how chatbots can address the problem, introduce the proposed application, and examine its technical feasibilities and difficulties. We will use AIML (artificial intelligence markup language) to build a rule database and the Pandorobot platform to deploy the chatbot. AIML is an easy-to-learn, open-source chatbot scripting language, which is an extension of XML (Extensible Markup Language).

**9. 60-Second Persuasion Theory**

**Presenter(s):** Parker Johnson, Evan Andriola, Dani Berch, Johanna Bos, Bella Briskorn, Alyssa Castanon, Hannah Chernin, Ryan Farias, Shayla Jamieson, Megan Johnson, Abby Kim, Belle Kunzmann, Lauren Label, Johnnie Ladd, Christine Lim, Spencer Loewen, Madi Mello, Macy Mena, Madeleine Monroe, Jane O'Connor, Bridget O'Neill, Kiley Panasuk, Ceili Peglar, Cayman Rai, Daniela Ramirez, Nick Richmond, Stefan Sandalis, Dylan Tinz, Nikki Trippler, Nicholas Valladares, Kali Weisman, Rocky Wetzler, Rachel Wilson, Nicole Yoo

**Advisor(s):** Dr. Austin Lee

School of Communication students present a new podcast series titled, "60-Second Persuasion Theory." The series consists of more than 30 episodes that introduce strategies and techniques of persuasion and compliance gaining that can be applied to a wide variety of real-world contexts. The episode focuses on interesting and practical applications of persuasion theory. For example, how can servers increase their tips? How can you make yourself appear more credible? What makes some salespeople like Billy Mays so effective? And how can we persuade people to wear face masks in the current coronavirus pandemic? Those questions and dozens of others are answered with scientific and empirical evidence from communication research. Inspired by Scientific American's "60-Second Science" series, each episode runs about two minutes in length and will be shared with the general public using platforms such as iTunes and SoundCloud. Audiences will get their daily dose of podcasts with these tiny social scientific expositions. The episodes are written and recorded by each student enrolled in Dr. Austin Lee's Theories of Persuasion course. A podcast is an effective way to communicate social scientific research to broad audiences. With this service-learning project, we aim to help the general public become more effective communicators.

## **FFC**

**10. Zeus and Indra: A Comparison of Greek and Vedic King Gods**

**Presenter(s):** Mika Bieber

**Advisor(s):** Dr. Eileen Jankowski

Although India and Greece are fairly widely separated geographically, both cultures imagined strikingly similar chief gods of their respective pantheons. Although originating from vastly different cultures, the undeniable similarities seen between Zeus and Indra are astounding. Zeus is the most powerful god according to Greek mythology and Indra according to the Vedas. Descriptions of both gods in Greek mythology and Vedic texts portray their birth, appearance, romances and adventures in strikingly similar ways. For example, heroism for both gods is achieved through both physical as well as spiritual deeds. Both have been associated with rain, thunder, and lightning as well as having fatherly and protective qualities. Despite both being immortal, they are envisioned with human bodies and features—but still look godlike. Based on the beards and sculpted human bodies found in ancient texts and sculptures, these gods are definitely chief gods among their respective pantheons, noble and imposing, showing that they are both gods of gods as well as men in their personification. Like humans, Zeus and Indra experience emotions of love, jealousy, and anger and can be seen throughout various mythic tales. These similarities point towards common ancestral and cultural links between Zeus and Indra and, in turn, between Greece and India.

**11. *The Chinese Zodiac: Mythological Origins to Modern Influence***

**Presenter(s):** Jojo Cho

**Advisor(s):** Dr. Eileen Jankowski

To most native Chinese, one's Zodiac animal sign indicates much more than just the individual's probable age. By identifying a birth year, month, day, and even time, the Chinese are swift to make inferences and assumptions about one's personal life, probable personality, and future potential. Such information is linked to their understanding of the Zodiac cycle, following the Chinese, or Lunar, New Year, which is indicated by tracking phases of the moon. Twelve animal signs--depicting the rat, ox, tiger, rabbit, dragon, snake, horse, goat, monkey, rooster, dog, and pig--make up the Zodiac, each representing a certain behavioral temperament and unique characteristics. The animals' species and specific order were designated by a legend of the "Great Race." According to this myth, the Jade Emperor desired a way to measure time, and so he devised a race across a river to determine which animal would represent each year. The first twelve to make it across were assigned the honor of a spot in the Zodiac cycle. Modern day cultures believe certain animals possess more desirable traits than others, that some are more challenging to get along with, and that some have more potential to be prosperous. These Zodiac associations have heavily influenced weighty life decisions as well as drive much economic activity in China and many other Asian countries. Regardless of the accuracy of such assumptions, over a quarter of the world is currently influenced by the Zodiac and its implications, making it a relevant topic of understanding for people of all cultures.

**12. *Morality and Mythology: Ancient China vs Ancient Greece***

**Presenter(s):** Ryan Clements

**Advisor(s):** Dr. Eileen Jankowski

In my research project I am investigating the stark differences in the mythological figures, gods, and stories of Ancient China and Ancient Greece and how those differences parallel the contrast in their social practices and cultural views. I find the stark contrasts between the two mythologies and cultures really fascinating, and have been delving into Ancient Chinese and Greek mythology alike, discovering new legends and deities and the stories that surround them, and then relating them back to their respective cultures. From my research so far, I am expecting there to be a clear difference in the morals and conservative values of the two cultures which is reflected in their mythologies. Ancient Chinese culture is much more conservative on topics like love, sex, marriage, etc. and also has a higher focus on moral goodness and perfection, whereas the Greek pantheon is much more "human" in a sense in that the Greek gods and heroes all have very human flaws such as jealousy, thirst for revenge, and selfishness. The Greeks also had a much more open and liberal view of sexuality and romantic partnership, which is expressed in their myths and gods as well. I hope to find the best specific examples of myths and mythological figures to represent this difference in culture as represented in their mythologies.

**13. *Latin American Myths***

**Presenter(s):** Skyler Doyle-Ortega

**Advisor(s):** Dr. Eileen Jankowski

Many famous and horrifying myths have stemmed from Latin America and live on today. These myths are typically told as scary "ghost stories" in Latin or Hispanic households. Three infamous ones are La Llorona, El Chupacabra, and El Cucuy. La Llorona can be traced back to Greek mythological figures such as Lamia and Medea. The Latin story is about a Mexican woman who drowns her two children in a river in Mexico to get revenge on her cheating husband, which ties in with Hera due to Zeus's affair with Lamia. Hera

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forced Lamia to consume her two children which inspired the myth of La Llorona. El Chupacabra is an apparent animal (that closely resembles Big Foot or a wolf) and was added to cryptozoology as part of an urban legend. It dates back to 1995 Puerto Rico and eventually traveled to the United States. There is also a connection to Aristotle, as it was believed that they sucked the milk of goats, going into the Caprimulgidae, which means “goat suckers”. The caprimulgids are also a group of birds known as “nightjars” or “goatsuckers”, mostly known in Guatemala. Lastly, there are many different versions of El Cucuy that are told today. El Cucuy can be depicted as a wolf-like creature, old man, ghost, or large reptile. It is mostly known as a skeleton figure that punishes children for bad behavior, almost like an evil Santa Claus. In other cultures El Cucuy can also be known as The Boogeyman. “El Cucuy” from “coco” comes from the Iberian Peninsula, specifically Portugal. Overall, these three myths that derive from Latin America leave an impact on Latin or Hispanic households and are heavily known today.

#### **14. The Nordic's Kraken**

**Presenter(s):** Ewan Finlayson

**Advisor(s):** Dr. Eileen Jankowski

The kraken. You may have heard of this beast because of its appearance in today’s pop culture, but have you ever heard the Nordic’s history behind it? History of its origins that suggest this beast may actually exist in a remote part of our world. History that explains why this creature is so significant in Norse culture. The kraken was birthed into Nordic folklore because of possible sightings back in the 12th to 13th century somewhere in the seas between Norway, Iceland, and Greenland. It was first mentioned in an Icelandic piece of literature titled Orvar-Oddr and then again in a scientific journal titled Konungs Skuggsia where the beast is described in great detail. Soon after those sightings, the kraken became more and more common in folklore as myths of the beast devouring ships or causing maelstroms started popping up. Now the Norse were known to be very accomplished sailors and navigators so it wasn’t common for them to find things along their travels that they could not explain, and the kraken was definitely one of those things. In today’s age although, we can be led to believe that those sightings were actually just mistaken for other large sea animals that had not yet been discovered; the fact that people used to believe they have seen or had encounters with the kraken although, is what makes this monster so significant in their culture today. Additionally, the Norse being so successful on the waters also makes the kraken a much more prominent character in folklore because it rests within a topic that they are very passionate about. Therefore, we can conclude that the kraken has had a strong impact on Nordic folklore because it was not just an idea, but rather a concept that sprouted from real life events that fall under one of the Nordic’s biggest passions; sailing.

#### **15. Eastern Dragons Vs. Western Dragons: Fire & Water**

**Presenter(s):** Jibran Hamady

**Advisor(s):** Dr. Eileen Jankowski

Dragons are mythical creatures that stand for power, control, and destruction, but in reality, that is only how a fraction of the world views them. Eastern Dragons are magnificent creatures that have been around for millennia and represent water and prosperity because they control rain and good harvest. In addition, Eastern Dragons come in all shapes and sizes leading from small dots to as large as the heavens above. Also, Eastern dragons reside in oceans and seas and are known as the water spirit. In stark contrast, Western Dragons are looked at as malicious, dangerous, fire-destroying creatures with a hot temper. In addition, western dragons reside in mountains, caves, and lairs, often protecting someone or something, usually gold or treasure that they wish to keep from others. Their element is fire and generally depicted

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as beast-like lizards with wings. Despite the fact that dragons often differ in many respects within Eastern and Western traditions, individuals from both cultures are intrigued with imagining a powerful winged creature that affects people across the world, either for good or ill. Dragons thus remain powerful creatures that control not only natural forces like water, fire, the sky, but also individual fortunes on earth. Dragons are respected, loved, feared and magnificent creatures that will uphold a legacy longer than us.

#### **16. Mermaids in Mythology and Present Culture**

**Presenter(s):** Katherine Hennessey

**Advisor(s):** Dr. Eileen Jankowski

The mermaid is mentioned in many tales told throughout time because they are mysterious and mystifying creatures. Each version of the mermaid is a compelling myth. These creatures were first told in Babylonian tales after the fish-god Oannes shared his wisdom to the people of the Persian Gulf. He merged as a creature that had never been seen before. His story then traveled to Greece, where the Greek people adopted this story and made the mermaids originate from the Greek god Titan. Greeks were the first to heavily spread this tale of mermaids, contributing to the many sailor stories that were created from Greek influence. The story of sirens would appear in fisherman's journals, claiming that these creatures were evil and would steal their goods and crash their ships by seducing them to come near the rocky shore. Another tale explains that sirens were viewed as competition for the classic Muses in mythology, and were turned into birds to suppress their evil. The Odyssey shows another classic interpretation of mermaids. The Greek figure of Achilles was said to have stemmed from mermaid descent. All tales describe mermaids as beautiful women with amazing voices. Mermaids can be found in Greek myths, but modern-day tales of these creatures focus heavily on the presentable side of mermaids and less on the evil side found within them. Modern-day depictions of mermaids can be seen in films like *The Little Mermaid* and countless other movies and novels based around these half-human, half-fish creatures. Mermaids in Greek mythology compared to modern-day mermaids would be considered exceptionally different and pose questions as to why these differences exist. Questions also arise as to what made these tales so interesting that people decided to continue spreading the tale of mermaids throughout history.

#### **17. Perun vs. Zeus in a Battle of Power**

**Presenter(s):** Vadim Karchemkin

**Advisor(s):** Dr. Eileen Jankowski

Many stories of ancient greek gods create a mix in the European culture, which give birth to similar excerpts of glorious heroes and omnipotent personas. The story of Zeus is well known across the world as the tale of a powerful and robust leader. A similar godly figure was noted by a Byzantine scholar Procopius in 500-565 CE. Perun is the Slavic mythical deity with attributes such as the god of thunder, lightning, and harvest. One interesting similarity with Greece which emerges in the name of Perun is the fact that people would sacrifice their cattle to the "Maker of Lighting", to appease the god and tame his impulsive character. Also, pagans of Slavic Europe would celebrate a summer holiday in honor of Perun on June 21st, the 4th day of the week since the original name "Parendan" is accurately translated to "Thursday". Besides this fact, Perun's actual appearance is in some way a brotherly copy of Zeus. Perun was a red-bearded man, with silver hair and a golden mustache holding a war ax, and riding on a chariot through the sky. Another symbolic appearance associated with Perun is in a form of an eagle sat upon a tree, patiently gazing at the world. Another point for comparison between Perun and Zeus is the significance



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and influence of other mythical figures, close-knit to both Perun and Zeus, such as wives and rival leaders. Ultimately, Perun stands as a promising candidate for side by side comparison and discussion as an equal of Zeus. The fact that Perun emerged early on in the history of ancient Europe, and in the eyes of European folks, creates a ground for debate, which can prove or disprove the one truly all-powerful god.

#### **18. Amaterasu; Kami of the Sun and Life**

**Presenter(s):** Branden Le

**Advisor(s):** Dr. Eileen Jankowski

Amaterasu; Kami of the Sun and Life Shintoism surfaced around the 6th century, which makes it the oldest religion in Japan. The religion consists of “kami,” who are godlike entities with power over elements or forces of nature, much like the Greeks. According to Shintoism, the world was created by two sibling lovers named Izanagi and Izanami. They bore many children that were also kami. As he bathed, Izanagi gave birth to three Kamis. From his left eye bore Amaterasu, the kami of the sun. From his right eye bore, Tsukuyomi, the kami of the moon and from his nose came Susanoo, the kami of the seas and storms. Although Amaterasu was not the creator of the universe, she inherited the title “Queen of Heaven.” Since Amaterasu is the “goddess” of the sun, many will try to compare her to Apollo, the Greek sun entity. However, not only is Amaterasu the sun entity of the Shinto religion, but she provides nourishment and life to everything on earth as well. Due to this, Amaterasu shares many more similarities with the Greek Goddess Demeter, the goddess of the harvest. The parallelism between the stories of Amaterasu hiding in a cave and Demeter searching for her daughter Persephone shows many of the same consequences even though they are deities of somewhat different elements. After an altercation with her brother, Susanoo, Amaterasu hides in a sealed cave, which consequently causes darkness to cast over the world. This allowed for evil spirits to run rampant and cause chaos among the earth. Similarly, when Demeter was focused on searching for her daughter, Persephone, she stopped paying attention to the harvest, which caused much famine and death in the world. During both of their absences, the world seems to malfunction and fall apart.

#### **19. Ideas of Death in Ancient Egypt and Ancient Greece**

**Presenter(s):** Abigail Luhrs

**Advisor(s):** Dr. Eileen Jankowski

This project will go over the similarities and differences of both the Greek and Egyptian views on death, the afterlife, and the funerary proceedings. Both the Egyptian god of death, Osiris, and the Greek god Hades will be spoken about as well as their different iterations throughout time. The god's characteristic and important myths with being spoken of and contrasted, as well as the characters of mythical creatures associated with them, looking for similarities and differences. Next, the poster will go over ideas of the afterlife and the levels and symbols that accompany it. It will also cover the preparations the living were expected to make before death to make sure of their success in the afterlife. Last, the poster will look for modern connections between the ideas of life after death and how the Greek and Egyptian beliefs may have impacted the practices of other religions such as Christianity.

#### **20. Chinese Dragons**

**Presenter(s):** Ann Ngo

**Advisor(s):** Dr. Eileen Jankowski

Dragons, mythical snake-like creatures, have been a part of many ancient traditions around the world. Arguably, the most revered were Chinese dragons as they were associated with imperial power. Rulers

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would wear dragon motifs to signify their descendance, blessing, and strength from these divine creatures. Dragons and Chinese culture are synonymous with one other as dragons existed in the early Neolithic cultures of China and throughout the ruling dynasties Xia to Qin. Excavated burial sites from the Xinglongwa culture depict dragons as early as 6,200-5,400 BC. Dwelling amongst clouds in the sky, they represent qi: one's inner life force, wisdom, and prosperity and preside over water. Chinese dragons exhibit body parts of nine other animals. According to Han dynasty scholar Wang Fu, they possess the antlers of a stag, the head of a camel, the eyes of a demon, the neck of a snake, the belly of a clam, the scales of a carp, the claws of an eagle, the soles of a tiger, and the ears of a cow. Each dragon has the same anatomy with 117 scales each having either a positive yang or negative yin essence. Initially dragons were benevolent, but Buddhist influences added malevolent characteristics as water can bring life, but also destroy in floods or sea storms. Counterparts like the Greek Ladon are beasts who are to be feared, not worshipped. Many Greek beasts, too, were used as explanations for weather phenomena like storms. Beasts' might was also created also to attest for the heroes' strength who had slain them. The two cultures had contrasting views of dragons, one worshipping the creatures and the other fearful of the ravenous beasts; only the strongest can defeat them, but like most other myths and legends they are used to explain or justify the unknown.

#### **21. Benzaiten: The Goddess of Everything That Flows**

**Presenter(s):** Rei Peterson

**Advisor(s):** Dr. Eileen Jankowski

In most mythologies, the gods and goddesses are based on or directly associated with others from the cultures that lived before them. In Japanese mythology, numerous gods and goddesses, or "kami," are represented throughout Japanese culture and values. Benzaiten, or Benten, was adapted in Japan during the 7th-8th century, where she was first considered to be the protector of samurai warriors. As the goddess was further implemented in Japanese culture, she became one of the Shichi-fuku-jin, which are the "Seven Gods of Luck." Along with luck, she now also represents literature, music, wealth, love, and femininity. She became predominantly known through her myth with a five-headed sea dragon. According to the myth, she marries a sea dragon to put an end to his attacks on the island of Enoshima, leaving them in an age of peace. Focusing on the history of the goddess, she stands hand-in-hand with multiple mythological figures including the Indian goddess Sarasvatī and the Greek goddess Aphrodite. When considering the relationship between Benzaiten and the Greek goddess Aphrodite, many similarities become evident. They both represent love and beauty in their respective cultures as well as having relations to the sea and being married to beings that were deemed undesirable (the dragon and Hephaestus). Benzaiten and Aphrodite demonstrate how both Japanese and Greek cultures hold love and beauty on a pedestal and showcase their importance in people's values.

#### **22. Thor Poster**

**Presenter(s):** Benjamin Reade

**Advisor(s):** Dr. Eileen Jankowski

Within my poster, there will be well articulated and researched information on the Norse God Thor that will show the viewer of my poster ancient myths about Thor, a timeline of his life and reign as the most powerful God in Norse history. Thor is a mythological figure that has remained relevant today and shaped the lives of people in past cultures. Through my research, you will see a God who was worshipped by his people for a number of reasons and experience what it might have felt like to be under the reign of the God of Thunder himself. My main focus in this project will be able to deliver a clear understanding of how

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Thor was seen through the eyes of his followers and also the eyes of outsiders. We will wind through the similarities he shared with other ancient Gods in different areas of the world and create a picture of Thor so it clearly depicts his true power and abilities of ancient Norse legends. Finally, I will order my poster to be aesthetically pleasing so the viewer does not only take away information in the reading they do but also in the pictures I specifically chose to convey Thor's raw power and strength.

#### **23. *The Role of Yan Wang in Chinese Mythology***

**Presenter(s):** Pirooz Romouzi

**Advisor(s):** Dr. Eileen Jankowski

The concept of death plays a significant role in many cultures, religions, and ideologies. Yan Wang, a central figure in ancient Chinese mythology, derives his roots from an early form of Buddhism in India. Alongside Buddhism, Hinduism is a major religion in India, and thus strongly influenced Buddhism and Buddhist figures. Originally referred to as the Hindu god, Yamaraja, Yan Wang emerged in Chinese culture as a result of the spread of Buddhism from India to China through trade routes during the Han dynasty in the 1st and 2nd centuries (CE). Yan Wang, known as the ruler of the Underworld and judge of the dead, became one of the most feared gods in ancient Chinese culture. A parallel to the Greek Hades and Tartarus, Chinese Diyu, contains multiple layers which Yan Wang presides over. Understanding Yan Wang's presence and importance in ancient Chinese culture allows us to understand the cultural diffusion between the East and West as well as the evolution of the explanation of the afterlife over time. In studying the Chinese perception of the afterlife and Yan Wang, we may see influences from Greek Mythological stories of the god Hades. Despite their similarities, Chinese and Greek conceptions of afterlife differ in how the Chinese believe that all are sent to Diyu, while the Greeks believe that some are able to go to a heaven-like place, the Elysian Fields.

#### **24. *The Filipino Aswangs***

**Presenter(s):** Barryne Rosario

**Advisor(s):** Dr. Eileen Jankowski

One of the most well-known and highly feared myths of the Philippines are the creatures known as "aswangs". The "aswang" is more of an overbearing term for any creature that you should fear being that it's translated as a "flesh-eating, shapeshifting monster". The Philippines was colonized by Spain around the 16th century dating these myths way back, it's a part of history. During the day they disguise themselves as regular people and prey on regular people as their feasts when the moon comes up. The aswang powers of strength, intelligent predator strategies, and ability to change their appearance even as a doppelganger weirdly enough, can be passed to another by a chicken egg. These powers can be attained by oneself when following a certain procedure or when an aswang wants to transfer these powers to another. Because of their high interest in a blood-fest, human-flesh diet they are commonly related to what we know as vampires. They are also similar to werewolves because of the way they choose to shapeshift into animals; mostly four-legged when looking for prey. Lastly, it has also been known that some of them tend to have powers in the day (while in human form), using them to heal or for the better of people much like witches. According to my source, there haven't been many individual stories where they would pinpoint a specific character or name which makes the myth (although many swear it's real) even scarier because there are so many more creatures to worry about.

**25. *The Impact of Skin Whitening Culture***

**Presenter(s):** Ryan Chan, Jack Chow, Jasmine Kim, Tina Huynh

**Advisor(s):** Dr. Stephanie Takaragawa

This project is part of FFC: Yellow Peril to Yellow Power, that critically examines Asian American history, culture and identity. This project is a deep analysis of how Asian Americans have been seen as perpetual foreigners in the US. Often described as "aliens" and initially not being involved in politics, Asians have struggled to assimilate into the United States. One coping method we believe to be damaging to the perception of Asian Americans is the use of western beauty products, especially skin lightening products. The desire to lighten one's skin color is a reflection of how people want to be accepted into western society and be apart of the Caucasian community. A prime example of this was the Supreme Court case, United States vs. Thind, where Thind was unable to become a citizen because they ruled that despite his argument about Asian Indians, he wouldn't be seen as Caucasian in the eyes of a common man. Through the analysis of past stories and western beauty trends, we can hopefully grasp a better picture as to why this has become an integral part of Asian American identity.

**26. *Watered Down Culture***

**Presenter(s):** Leena Khan, Michael Pepito, Kelli Chamberlain, Rosie Rady, Michael Liu

**Advisor(s):** Dr. Stephanie Takaragawa

This project is part of FFC: Yellow Peril to Yellow Power, that critically examines Asian American history, culture and identity. This project examines the movie "The Last Airbender", directed by M. Night Shyamalan and it's portrayal of Asian cultures. Movies that portray Asian characters commonly use stereotypes to portray these characters. From the use of black face in early American film to the portrayal of Mr. Yunioshi in 1961's Breakfast at Tiffany's, Hollywood has an inconvenient history racially misportraying non-white characters and culture. Directors constantly misportray Asian cultures and utilize their spiritual elements to create a "mystical" or "foreign" setting. Commonly, non-Asian actors and actresses will be casted for the roles in which the characters are identified as Asian. Our research presentation uncovers the continual mis-appropriation of Asian culture within Hollywood and its socio-political consequences when presented to an American audience. This project looks at the exaggerations of some cultures and lack of representation among other cultures in the movie as well as discussing the mostly white cast that was used to portray Asian and Indigeounous character. We expect to uncover the watering down of Asian cultures that we often see in entertainment media and how this is used to attempt to be more appealing to non-Asian audiences.

## **Film**

**27. *How Poorly Made Hollywood Anime Adaptions Hurt Asian Americans.***

**Presenter(s):** Arya Vajpayee, Coco Hollings, Rinny Nguyen, Tristan Thoney

**Advisor(s):** Dr. Stephanie Takaragawa

This project is part of FFC: Yellow Peril to Yellow Power, which critically examines Asian American history, culture, and identity. The purpose of our project is to illustrate how the westernization of Asian media, such as live-action anime adaptions, negatively impacts Asian American representation and identity. Hollywood's obsession with taking anime stories away from the hands of its Asian creators and remaking it in an unoriginal form depicts its lack of respect for the content and furthers the false notion that American made content is superior. This misrepresentation goes beyond whitewashing, as it is Hollywood disregard for the original stories that lead them to make unfaithful adaptions, which hurts the image of

Asian culture in Western media. These adaptations hurt the culture of Asians in general and Asian Americans because they have to experience Hollywood taking stories made about their cultures and misrepresenting them. Using examples of already made live-action adaptations (Ghost in the Shell, Dragon Ball, Death Note) and future ones (One Piece, Cowboy Bebop, Your Name), we hope to prove that Hollywood making these live-action adaptations that poorly represent Asian culture not only hurts them but it also hurts Asian Americans.

## **Health & Strategic Communication**

### ***28. Assessing Communication Strategies for Athletes at Chapman University***

**Presenter(s):** Preetha Raj, Amanda Hamilton, Talia Brennan

**Advisor(s):** Dr. John Miklavcic

Nutrition is a critical component to improve and maintain athletic performance, however, without formal intervention, it is difficult to predict the level of understanding athletes have on sports nutrition principles. The objective of this research study is to test the effectiveness of educational intervention methods on lifestyle and behavior changes related to nutrition. The study compared the effectiveness of two interventions: a virtual seminar and three email newsletters circulated to all athletes. Survey responses will be used as a way to measure information retention and behavioral changes. A survey was constructed on Google Survey to track measurable health behaviors and categorize all athletes based on gender, age, sport, and position. All athletes at Chapman University were given a digital survey prior to any education intervention to assess their existing knowledge of nutrition material and health topics. Additional questions were included to evaluate the effect of COVID-19 on student-athletes diets. Athletes attended a 45-minute virtual seminar on sports nutrition principles at the start of their season and completed a digital survey one week after. Survey questions were evaluated using descriptive analysis by Google Survey metrics. Results from the survey after the live seminar indicated an increase in overall concern for diet by 23.4% by all respondents. Further evaluation is needed to determine if email newsletters are effective at communicating nutrition information to student-athletes.

## **Health Sciences and Kinesiology**

### ***29. Movement Variability During ADL among Neurological Disorder Populations Using Inertial Sensors***

**Presenter(s):** Johanna Daerendinger, Bridgette Kohl

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

Millions of individuals worldwide suffer from Parkinson's disease and stroke. Medical expenses are on the rise, which negatively contributes to the difficult conditions these patients are already experiencing. In addition, it has been known that activities of daily living (ADL) are limited in older adults compared to younger counterparts. The neurological disorder populations being investigated in this project are Parkinson's disease patients and stroke patients and they are being compared to the healthy control group consisting of healthy older and younger individuals. In this study, the McRoberts sensor, that is used to measure acceleration and gyroscopic data, is worn by the participant on their lower back for three days. The sensor data collected has allowed us to explore the movement variability during ADL of these populations. ADL is the activities of daily living; this is measured by monitoring the basic activities that are completed by individuals without assistance as the individual accomplishes their daily routine. In these three days, the only time the sensor is allowed to be taken off is when the participant showers or

anticipates entering water at any given point in time. We expect to find a significant difference in variability during ADL amongst the different populations. Sleep patterns and sleep activity will be compared to the healthy pool of individuals who do not have these illnesses. In the future, this informative metric could be helpful in predicting severity of disease or progress of rehabilitation. Thus, our study will provide a new metric to objectively quantify an individual's health status.

## **Music**

### ***30. Breaking Down Tradition: Restructuring Orchestras for the Well-Being of Musicians***

**Presenter(s):** Renee Grace Acupan

**Advisor(s):** Dr. Jessica Sternfeld

Classical orchestras and ensembles have been around for centuries. Over the years, many people have noticed the lack of satisfaction amongst orchestral musicians, paving way to the recent research analyzing stress and the organizational structure of classical orchestras. Orchestras are unique in that a group of 200 or so people come together and play synchronously under the direction of one person guiding them with a stick. At times, many find themselves with reduced autonomy or artistic creativity in the work environment after being trained to musically express themselves through years of schooling. With the importance of mental health arising, psychologists are now taking into account the effects of stress and the environment, especially within orchestras. This essay highlights the effects of the traditional orchestral organization, and how it damages the psychological well-being of its musicians due to the poor use of the psychological needs - autonomy, competence, and relatedness. A democratic approach ensures the musical artistry does not reside solely in the conductor, but also in the musicians. By investigating ensembles both with and without a conductor, and examining articles and studies, I argue that greater well-being can be achieved when these psychological needs are met.

### ***31. Polarity Theory: How the Undertone Series Tells a Different Story About Harmony***

**Presenter(s):** Ian Policarpio

**Advisor(s):** Dr. Jessica Sternfeld

When we listen to music, people generally know what sounds "right" and what doesn't. Even the average layman can identify consonance from dissonance. But what is it about music that tells us whether or not it sounds "right?" There is a psycho-physical element in harmony, as it is rooted in acoustics and our perception of the harmonic series. The way we perceive harmony is via a base pitch, which is used as a "generator" for the harmonics that accompany it. Our fundamental ideas of consonance, dissonance, chords, and how to construct them—they are all built on the overtone series. Our ears, however, tell us a different story. According to the overtone series, a minor triad would be considered dissonant, in contrast to the consonant major triad. But when we hear a minor triad, we hear consonance. How can this conflict be justified? Using the ideas of music theorists such as Levarie, Levy, Rameau, and Rings, this essay will demonstrate the use of a theoretical "undertone series," which is simply the overtone series mirrored across the generator pitch, and how we perceive harmony as a gravitational pull on that generator, extending in both directions rather than purely upwards as it occurs as a natural phenomenon. This will be demonstrated through exercises in music theory and composition, as well as various excerpts from pieces such as "Morgen!" Op. 27 no. 4 by Strauss and *Das Fischermädchen* by Schubert.

## **Pharmacy**

### **32. *siRNA Therapeutics: Recent Advancements, Carrier Design and Future Perspectives***

**Presenter(s):** Shun Kato

**Advisor(s):** Dr. Rakesh Tiwari

RNAi or RNA interference is a well-known natural phenomenon that has lots of potential for therapeutic applications in regard to the post-transcriptional regulation of genes. More specifically, the introduction of a natural or synthetic complementary siRNA of the gene of interest into a diseased cell has the potential to silence the target gene that may be harmful to the cell. Once inside the cell, the siRNA takes advantage of the naturally occurring RNA interference pathway through its incorporation with the RNA-induced silencing complex (RISC) to degrade mRNA. Although the process seems rather simple, siRNA therapeutics face many obstacles on the way to its targeted cell. The most complex among them are, degradation by nucleolytic enzymes, uptake by cells of the immune system, and inefficient tissue penetration. More specifically, enzymes such as endonucleases and RNases can degrade siRNA in the blood circulation and excrete it through the kidneys. Additionally, the mononuclear phagocytic system, particularly macrophages in organs such as the liver, lungs and spleen can phagocytose or ingest the siRNA which it recognizes as foreign material and remove it from circulation. In order to combat this, the use of nanoparticle carriers have grown in interest over the last decade. Among them, lipid-based lipoplexes, polyplexes, and protein-based carriers have shown much promise in overcoming the initial barriers. This review aims to discuss the recent advancements being made in the carrier design and clinical setting, as well as future perspectives regarding its potential to combat diseases such as SARS-COV2, cancer, and neurodegenerative diseases.

## **Political Science**

### **33. *One of the Fastest Rising Fears in America***

**Presenter(s):** Giovanna Potestio

**Advisor(s):** Dr. Ann Gordon

On average, there is a mass shooting every 12.5 days in the United States of America. The frequency of this event has caused panic amongst the population, with many fearing they will personally become victimized. According to The Fear Survey by Chapman University, which has been conducted for the past six years, becoming someone's random shooting target in a public setting is one of the fastest rising fears in our country. This paper examines how the consumption of certain media platforms such as Fox News, CNN, local television stations, social media apps, and more heighten a person's internal worry regarding the event of a random shooting. Social media is the most influential upon a person's fear because information is exaggerated and broadcasted repeatedly on a daily basis. In addition, gender is weighed in terms of seeing which sex retains a greater amount of apprehension when it comes to protecting themselves in such an event. Women are more likely to express more fear than men because they report feeling more vulnerable to acts of violence. Then, the likelihood that an individual will purchase a gun after a mass shooting has occurred will be assessed based on a person's self-evaluated fear level. In addition, someone's fear of a random mass shooting will be compared to their party identity: Republican, Independent, or Democrat. And to finish, the area of one's permanent residence: rural, city, or suburban, will be looked at to see its influence on one's internal worry. In theory, there will be a conclusion as to what components contribute to one of the most rapidly growing fears in America.

**34. *Crime and Political Behavior***

**Presenter(s):** Cassidy Tran

**Advisor(s):** Dr. Ann Gordon

When studying the factors that contribute to an individual's political behavior, seldom considered is the individual's personal experiences with crime. This paper examines the extent to which individual crime victimization and crime rates influence citizens' political behavior, reflected through their voting choices, public policy preferences, and political ideology. Experiences with crime and crime victimization can shape or warp a person's perspective of life, carried over in their political preferences and acts in the political world. Using the nationwide 2014 Chapman University Survey on American Fears (CSAF) and drawing from official crime statistics such as the Federal Bureau of Investigation's Uniform Crime Report (UCR), this paper empirically analyzes how citizens' political behavior is swayed by crime. It will look at crime rates on a local, state, and national level and analyze the extent to which an individual's political actions are swayed by them.

**35. *The Issues that Americans Care About: Analysis of Why Americans Voted for a Presidential Candidate***

**Presenter(s):** Dylan Derakhshanian

**Advisor(s):** Dr. Ann Gordon

With the 2020 United States presidential election fast approaching, discussions and arguments about who is the best choice to run our country are constant and frequent. Time periods around these elections put politics and different types of issues affecting Americans in the forefront of our minds. This study aims to identify the main issues that different Americans hold most important while voting for the President and how these main concerns have changed over time. Using data from the 2000 and 2016 Presidential election, the top 3 concerns of voters from the 2 main political affiliations, Democrat and Republican, are contrasted with who voted for which candidate and why. Within the span of 16 years, global events, shifts in political ideology, and changes in demographics have drastically affected who is elected President and why voters resonated with their platform. Results showed that while both Democrats and Republicans held the economy as the most important issue while voting for a candidate in both 2000 and 2016, the fear of being a victim of a terrorist attack and a hate crime have drastically increased between these two elections. Our analysis shows that while issue voting was an important determining factor during the 2000 election, party affiliation has become a more reliable method to determine who an individual is voting for.

## **Psychology**

**36. *Pupillometric Investigation of Spontaneous Action and Intention Awareness***

**Presenter(s):** Kate Harder, Ruby Moss, Jake Gavenas

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

The neuroscience of volition, to a large extent, investigates the neural precursors of conscious decision-making and action. Pupillometry is a powerful tool for investigating conscious and attentional processing, partly because of its connection to the locus coeruleus (Josh et al., 2016). For instance, in an attentional blink paradigm, differences in pupil dilations were associated with conscious versus nonconscious stimuli (Wierda et al., 2012). Nevertheless, this technique received little attention in the study of volition. We collected pupil data during a spontaneous action paradigm, where subjects freely pressed a button at a time of their choosing, sometimes reporting their onset of movement or of intention using a clock (Libet



et al., 1983). Preliminary analysis (N=12) demonstrated significant differences in baseline pupil size between conditions, potentially indicating cognitive load differences. Furthermore, replicating Richer and Beatty (1985), we found significant dilations before spontaneous movements. There were also indications that larger, pre-movement pupil dilations occur before reporting movement compared to before intention timing. These results support arguments that task demands, such as monitoring awareness, may affect the underlying neural activity leading to action and impact recorded signals—e.g., the readiness potential (Trevana and Miller, 2011). Moreover, these results offer a starting point for the use of pupillometry in studying conscious action production.

**37. *Pediatric Asthma and Psychological Resilience: Examining Whether Family Functioning and Social Support Relate to Asthma Symptoms and Lung Function***

**Presenter(s):** Dalia Jaafar

**Advisor(s):** Dr. Brooke Jenkins, Dr. Eric Sternlicht

Upwards of 6 million children in the United States are afflicted with pediatric asthma. While previous research has linked asthma to multiple contributing biological and environmental factors, recent research suggests that psychological and social factors may have an impact on physiological outcomes of asthma like lung function and lung inflammation. Therefore, we suggest the need to study the impact of positive psychological factors such as a well-functioning family environment and beneficial social support on symptoms and lung function of children diagnosed with asthma. In the present pilot study, we recruited a total of 15 children with a confirmed asthma diagnosis and their parents from the Division of Pulmonology at the Children's Hospital of Orange County. Participants were asked to complete an initial baseline assessment and ecological momentary assessments four times a day for seven days followed by a final follow up survey. Asthma symptoms and pulmonary function were measured using a 7-item Asthma Control Diary, and peak expiratory flow (PEF) values were gathered using data from self-administered spirometer recordings. This pilot study demonstrates the feasibility in collecting ecological momentary assessments surrounding positive psychological factors. In testing the associations between family functioning and social support on children's asthma symptoms and lung function, children who received more support from teachers ( $b = 0.03$ ,  $t = 2.34$ ,  $p = 0.048$ ) and close friends ( $b = 0.04$ ,  $t = 3.88$ ,  $p = 0.006$ ) had worse symptoms and lung function. Family functioning was not significantly associated with asthma symptoms and lung function ( $b = -0.00$ ,  $t = -0.03$ ,  $p = 0.975$ ). Based on the results obtained, significant associations were only found in some aspects of social support. Children with more social support had worse asthma symptoms and lung function. This negative association might be an issue of reverse causality in which children who need more assistance receive more support. Next steps in this work include testing these associations in a larger-scale study.

**38. *Loneliness as a Predictor of Physical and Mental Health Problems in University Students***

**Presenter(s):** Jolie Binstock

**Advisor(s):** Dr. Julia Boehm

The COVID-19 pandemic has created unprecedented living conditions marked by less socialization, specifically for university students used to dorm-living, study groups, and university-hosted social events. A national emergency was declared, and social lives ceased as much of the United States was placed under quarantine, creating an environment of isolation. Previous research focusing on the elderly shows a relationship between loneliness and increased mental health problems such as depression and anxiety, but research examining the association between loneliness and mental and physical health in university students is scarce. It is crucial to study the relationship between loneliness and poor health in university

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students as current dorm occupancy limits and online learning have further exacerbated isolation beyond the initial quarantine. We hypothesized that higher levels of self-reported loneliness would correlate with worse mental health symptoms and physical health symptoms. An online survey was completed by 292 undergraduate and graduate students at Chapman University from May 15th, 2020 to the end of May during the pandemic. Student were asked to self-report information regarding health, psychosocial factors, academic experiences, housing situations, and financial situations. This study utilized the Three-Item Loneliness Scale, Generalized Anxiety Disorder 7-item scale (GAD-7), the Center for Epidemiologic Studies Depression Scale (CES-D), and the Cohen-Hoberman Inventory of Physical Symptoms (CHIPS) to assess the effect of loneliness on physical and mental health using linear regression analyses. Results indicated that higher levels of loneliness were associated with worse mental health symptoms (p-values < 0.001), as well as worse overall physical health and more physical symptoms (p-values < 0.01). In sum, loneliness was detrimental to the health of students. Possible confounding variables are factors such as financial instability or the impact of having the COVID-19 virus.

#### **39. *Perturbing the Sense of Agency***

**Presenter(s):** Maiia Tolia-Shah, Brenda Gutierrez, Alice Wong

**Advisor(s):** Dr. Uri Maoz

The goal of this experiment is to test a model of the sense of agency, intention, volition, and causality in order to examine the time course of the sense of agency associated with voluntary and involuntary movements. We examine the roles of context, expectation and sensory feedback in the feeling of agency as well as examining the aspects of volition in different kinds of decisions. This experiment is thought to be very novel as it stimulates an internal signal for movement from an external source which is why the participant can find it hard to decipher if they are fully in control of their actions or not. The project explores the participants' self-reported level of agency, to see the range and types of precept that emerge among the individuals. It will examine the role of context and expectation and compare different forms of volition and decision. The non-invasive, transcranial magnetic stimulation (TMS) stimulates the motor cortex, intermixing the resultant motor movements with motor movement of the participants own volition. TMS is a method of brain stimulation that relies on electromagnetic induction using an insulated coil placed on the scalp, to elevate brain function. The TMS coil will be placed above the scalp in a position that triggers a slight hand movement, the subject will then be instructed to make the same movement at will. It is expected that the participant will report ambiguity when asked whether the movement was due to them or the TMS. There should be an affect on the sense of agency by the TMS especially when it is close to the voluntary movement.

## **Theatre**

#### **40. *Invisible Performances: The Significance of Voice Acting and Its Conversation About Representation in the 21st Century***

**Presenter(s):** Melissa Cho

**Advisor(s):** Dr. Jocelyn Buckner

Since the rise of radio drama in the 1920s, receiving performances by auditory mediums have infiltrated our lifestyles in the modern day. The term radio drama most likely conjures up images of World War II radio plays filled with over the top dialogue and slightly kitschy sound effects. However, in addition to this 20th-century trend which helped spur the start of aural performances, your favorite podcasts, your newest Audible selection, animation, live Zoom readings, film and documentary narration, and even audio

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descriptions for the visually impaired community, have blossomed into widespread usages of 21st-century voice entertainment. These invisible actors bring life into the characters they embody and the thematic messages they help convey. Especially now, the pandemic has fueled a boom in voice acting projects. While the comeback of voice acting provides new forms of amusement to audience members, the anonymity of these actors raises questions of representation beyond the screen. In June of this year, Jenny Slate decided to step down from her animated role in *Big Mouth*, in which she explained that “Black characters on an animated show should be played by Black people....I was engaging in an act of erasure.” In this thesis, I will explore the ways in which voice acting permeates our lives and its significance through certain practices, specifically live readings, audio book narration, and animation voice acting. I will also bring up questions regarding voice actor representation—is casting someone of a different race for an ethnically different character justified? Should a creative team strive to be color-blind or color-conscious when casting? Through compiling research and contemporary examples of shows and programs, I plan to argue the significance of voice acting and the need for proper representation, even when it may not seem to make a difference through purely acoustic performances.

#### ***41. American Theatre Education: Developing the Systemic Racism Needed for the Discriminatory Entertainment Industry to Thrive***

**Presenter(s):** Madison Demaris

**Advisor(s):** Dr. Jocelyn Buckner

A University of Arkansas 2014 study “The Educational Value of Field Trips” provided unintended evidence that students who had seen live productions of literary works had much higher tolerance levels, academic knowledge, and empathy for the characters than the students who had only read the text. It is widely known within the theatre and education community that having access to an arts education in k-12 schools leads to more emotionally intelligent students that are incredibly empathetic. In many schools, the theatre is sometimes one of the only places that minority students can feel safe and supported due to the high empathy levels seen in these groups. However, what happens when these safe spaces are still perpetuating the racial disparities that are harming those same students in the first place? One of the most significant issues facing our current domestic policy in the United States is the treatment of people of color, specifically black Americans. Thus, it is imperative that we examine and investigate current foundational systems including but not limited to the curriculum taught, after school programs, and competition programs to ensure the fair treatment of not only all of our students, but everyone. I argue that there is a massive disconnect between what theatre educators teach in their classrooms and what they are putting into practice in their theatres, after school programs, educational competitions, and conferences. Through a series of interviews, literature review, and statistical analysis, I will define current harmful practices and cultures in educational theatre and propose a series of tangible improvements to be made to develop a diverse, accepting, and tolerant educational theatre framework.

#### ***42. I'm Not Like Other Girls***

**Presenter(s):** Lily Ruffner

**Advisor(s):** Dr. Jocelyn Buckner

Internalized misogyny is when women subconsciously project sexist ideologies onto themselves as well as others. “I’m not like other girls” is a statement coined by the media to say that in order to be the ideal girl, one must separate themselves from anything that seems stereotypically feminine or defined as “girly”. For example, this type of female is often painted in the media as the type to never wear makeup, be “one of the boys”, not be friends with other women because they create too much drama, believe

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female comedians are never as funny as male comedians, and would never dress for fashion. Claiming to be “not like other girls” implies that all of the “other girls” are inferior in their behavior. Many female-identifying individuals are often raised to believe it is a compliment when people say “you don’t throw like a girl, you’re cool” or “I like that you don’t wear high heels or makeup and listen to non-mainstream music, you’re unique”. Compliments, similar to the stated examples, are essentially saying that “you being different from the rest makes you one of the good”. For my thesis, I aim to explore normalized internalized misogyny in the media and the psychological effects that the concept has on people as they grow up and figure out who they are as individuals. I will be analyzing social media, film, podcasts, and literature in order to gain a better grasp on how this concept has become so saturated in mainstream media. In addition to research into the psychology of internalized misogyny, I will be conducting anonymous interviews with women to gain further insight. I ultimately aim to uncover what exactly internalized misogyny is and how it has become subconsciously manifested in the female psyche.

#### **43. *The Fifth and the Sixth: Music in Theatrical Sound Design***

**Presenter(s):** Ethan Shanklin

**Advisor(s):** Dr. Jocelyn Buckner

Aristotle wrote about the importance of music and spectacle in theatre in his *Poetics*. Music has been an integral part of theatre for centuries, dating back to the days of the Ancient Greeks who used music extensively in their works, making full use of a chorus for dramatic effect on their audiences. Opera and musical theatre have forever intertwined music and stage, combining the human, emotional elements of theatre and the moving power of music. Improvements in entertainment technology give theatremakers the power to create ever-more personal and impactful stories. With the capabilities of modern audio systems and music technology, musical expression can further enhance a theatrical performance through a full and immersive aural experience, from filling a room full of the sounds of the setting to giving audiences a chance to actively participate in the making of their performance (Petit). Audio has never been easier to manipulate, giving sound designers the power to craft just the right sounds to fit whatever medium they may be designing for. Designers can record the most mundane of things, from a phone ringing to the ambient sounds of a passing day in a city, and create such stunning soundscapes in which theatre can play. Music technology, however, can on top of existing techniques, bring an altogether different feel to the existing repertoire of sound design in the field, combining the performative aspects of theatre with its technical design. Through modern playback software such as digital audio workstations and the use of modern, musical interfaces, the making of theatre can enter exciting and collaborative soundscapes. I plan to demonstrate the efficacy of music technology in theatrical sound design by utilizing techniques from music technology, such as synthesization, physical computing, and the use of music theory to create a soundscape for the experimental work *Terminal* by Susan Yankowitz.

#### **44. *Makeup Through the Decades: 1920-2020***

**Presenter(s):** Hannah Andersen

**Advisor(s):** Dr. Jocelyn Buckner, Joyce Cantrell

In this research project I explore the ways that makeup products, trends, and applications have changed over the years beginning in the 1920s, up until now. Through the many historical high and low points over the last century, one thing that has remained constant is the desire look and feel beautiful. In today’s world, beauty can really be anything that makes an individual feel comfortable and confident in one’s own skin, and sometimes that happens to be nothing at all. The aim of this project is not to argue that people have needed or currently need cosmetics to look and feel beautiful. Rather, I aim to find what the

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overarching popular standard of beauty was for each decade and why. I look to popular media, ad campaigns, magazine articles, films, and celebrities from each decade to distinguish the popular makeup trends and styles. I then consult academic sources on the history of makeup in order to delve further into why makeup trends were what they were, and how they rose to popularity. Additionally, I will use my findings to design and execute two makeup looks for each decade- one will be rooted in historical accuracy, and one will be my artistic interpretation of the decade's makeup as if I were designing for a theatrical performance or film. In doing so, I gain a deeper understanding of makeup techniques and styles throughout history, as well as improve my own skills as a makeup artist, entertainer, and scholar.

#### ***45. We See You White Shakespeare: The Rebirth of Post Pandemic Theatre and Transformation of Colonized Theatre***

**Presenter(s):** Meghan Pender

**Advisor(s):** Dr. Jocelyn Buckner

Theatre is an ever changing art form, constantly adapting itself to modern day issues and relevance. In light of recent events, theatre is going under the microscope and being reinvented. Most theatre and any live performance for that matter has been shut down in the middle of the COVID-19 Pandemic. In the wake of George Floyd's and Breonna Taylor's murder the Black Lives Matter movement has gained increasing popularity. In response to BLM, the manifesto "We See You White American Theatre" has become a movement of its own. As a director, I must learn to adapt with my craft and ask myself how my art can adjust to the current times while still remaining impactful. Adapted repeatedly for over 400 years, Shakespeare is a global playwright whose works grapple with modern questions and adapt through different cultural lenses. I am going to use his plays and the shakespearean system as a platform to connect to today's issues in the United States theatre system such as: lack of representation and diversity, educational arts funding, and live theatre in a pandemic. I will also be researching how Shakespeare remains relevant today and why it has survived and adapted for so many years through interviews with Shakespeare scholars. I will analyze the positive effects, like Shakespeare Behind Bars, and negative effects, like "Bardolatry" and colonialism. By directing various Shakespeare monologues, I will use my skills as a director and knowledge from the research in this thesis to explore the universality of Shakespeare with BIPOC actors. In each of these categories I use the BIPOC Demands of White American Theatre as my guide of where the Shakespeare System is getting it right and where there is work to be done. In their demands they say, "We demand a transformation of our theatrical ecosystem. We demand your commitment to radical change now, and we will hold you to it." I am holding the Shakespeare system to it and in the end, I will conclude how successful the Shakespeare system is or can be in our modern world in its inclusivity, equity and relevance to today's issues.

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