Spring 5-2019

Spring 2019 Student Scholar Symposium Abstract Volume

Chapman University Center for Undergraduate Excellence

STUDENT SCHOLAR SYMPOSIUM

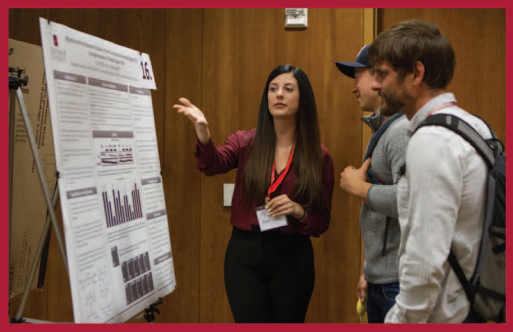
SPRING 2019

WEDNESDAY, MAY 1
AND
THURSDAY, MAY 2

SPRING SESSION

ABSTRACT VOLUME





CHAPMAN UNIVERSITY | **Center for Undergraduate Excellence**

Message from the Director

Greetings and welcome to the Spring 2019 Chapman University Student Scholar Symposium! 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.

Student Scholar Symposium celebrates the remarkable scholarship and creativity conducted by Chapman students. As research and creativity inquiry has grown across the campus, the Spring 2019 Symposium has evolved into two full days. In addition to the poster presentations of previous years, we welcome the addition of oral and visual art presentations, allowing our students multiple ways to showcase their research and creative projects.

Our student presenters reflect the diversity of academic and creative disciplines thriving within the Chapman community. Please take some time to stop by and listen to students discussing their research/creative activity, engage with some visual art in Argyros Forum or wander through the vast array of student poster presentations in Sandhu to discover the kind of work our students are engaged in here at Chapman. Chapman University Student Scholar Symposium is education in action, a true example that Chapman students are pursuing anything imaginable!

This year we owe a special thanks to the CUE Advisory Board and Dr. Micol Hebron for her assistance with the Visual Art Presentations. And thanks to all the student presenters and their faculty mentors!

Dr. Julye Bidmead

Director of the Center for Undergraduate Excellence at Chapman University

Keynote Speaker – Dr. Zeinab Dabbah (JD ’12)

Dr. Zeinab Dabbah was born in Cairo, Egypt and received her MD at Cairo University, where she was a Dean’s Scholar for Academic Excellence and on the Dean’s Honor List for four years. She trained in internal medicine at LAC + USC Medical Center in Los Angeles, and was certified by the American Board of Internal Medicine in 1994. She received the Lanterman Regional Center Award for community leadership in 1995. Dr. Dabbah practiced primary care medicine with HealthCare Partners Medical Group in Pasadena, California for ten years, where she also served as Regional Medical Director for Utilization Management, and received the HealthCare Partners Care Giver Award in 1999 and Team of the Year Award in 2001. She then joined Anthem Blue Cross of California, where she became Chief Medical Officer and received the WellPoint Best of the West Team Award, and was named Exceptional Woman during Blue Cross of California Women’s History month. She was also awarded a scholarship to the American Health Insurance Plan Executive Leadership Program, where she earned her certified Health Insurance Executive designation. She was an Adjunct Associate Professor of Medi-cine at USC Keck Medical School in 2014. Dr. Dabbah attended the Fowler School of Law, where she was awarded Merit Scholarship in 2009 as well as multiple CALI Awards in 2010, 2011 and 2012. She graduated cum laude in 2012 with an Emphasis in Advocacy and Dispute Resolution. She then established her law office in Pasadena in 2012. In 2017, Dr. Dabbah received the Chapman University Distinguished Alumni Award, which honors alumni who achieve remarkable professional success and have made significant contributions benefitting com-munities across the nation and around the globe. Dr. Dabbah was among 30 prominent Egyptian women leaders from around the world selected to receive an award at the 2017 “Egyptian Women Can” Conference, a summit on women’s empowerment in Egypt. Dr. Dabbah and her husband, Dr. Daniel Temianka, are active philanthropists who have been strong supporters of Chapman University and the Fowler School of Law; their contributions include a gift to name the Professor Frank J. Doti Lecture Hall in Kennedy Hall, a multimedia room and Henri Temianka Archives at the Leatherby Library as well as an endowed music professorship and scholarship in memory of Daniel’s father, renowned musician Henri Temianka. They support their community with generous gifts to Classical KUSC, Rose Bowl Aquatic Center and the Harmony Project. Dr. Dabbah and Dr. Temianka established the Henri Temianka Audio Restoration Laboratory at University of California, Santa Barbara. Together, they were recognized as Chapman University 2018 Citizens of the year.

Dr. Dabbah is currently a vice-chair of Chapman University’s board of trustees, and also serves on the Academic Committee, the Long-Range Planning Committee, Fowler’s Law School Board of Advisors and Dean’s Council. She also served as a member of the Crean College Health and Behavioral Science Leadership Council. She has a special interest in residential construction, and is fluent in Arabic. She and her husband Dan have four children and one grandson.

Acknowledgements

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

- Dr. Glenn Pfeiffer, Provost
- Crean College of Health & Behavioral Sciences
- Donna Ford Attallah College of Educational Studies
- Schmid College of Science and Technology
- Wilkinson College of Arts, Humanities, and Social Sciences

Schedule of Events

Wednesday, May 1

Oral Presentations
Session I: 9:30 - 10:30 am
Session II: 11:00 - 12:00 pm
AF 209 ABC

Poster Presentations
Session I: 1:30 - 3:00 pm
Sandhu Conference Center

Visual Art Presentations
Session I: 3:30 - 4:30 pm
Session II: 4:45 - 5:45pm
Session III: 6:00 - 7:00 pm
AF Student Union Stage

Thursday, May 2

Poster Presentations
Session I: 9:30 - 11:00am
Sandhu Conference Center

Oral Presentations
Session I: 1:30 - 2:30 pm
Session II: 3:00 - 4:00 pm
AF 209 ABC

Keynote and Awards Dinner
Keynote: Dr. Zeinab Dabbah (JD ’12)
5:30 – 7:30 pm
Beckman Hall Rm 404
By invitation only

Visual Art Exhibition
Monday, April 29–Friday, May 10
Argyros Forum Student Union Gallery

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Thursday, May 2

Oral Presentations- Session I

Wednesday, May 1 | 9:30AM-10:30AM

Argyros Forum

AF 209 A

Biochemistry and Molecular Biology

Structure-Function Analysis of Metal Clusters in NifA

Presenter(s): Ashna Shah, Hiba Zaidi, Justyn Golobic, Sarah Amaya

Advisor(s): Dr. Cedric Owens

Ammonia is a very important plant nutrient; it is produced biologically in bacteria by the enzyme nitrogenase. Generating ammonia in bacteria requires a large amount of energy in the form of ATP and reducing equivalents. Therefore, the reaction is heavily regulated by transcription factors that only turn on nitrogenase when it is needed. The sigma-54 activator NifA is the main mediator of nitrogenase expression. It turns on transcription when ammonia levels are low and sufficient reducing equivalents are present. Sensing reducing equivalents in NifA depends on several metal clusters that are bound to the protein. The location and redox sensing mechanism of these metal clusters are, however, unknown. The overall goal of this project is to determine the location of the metal clusters in NifA. Specifically, we want to know which cysteine residues coordinate the metal clusters. NifA contains seven cysteines. By conducting site-directed mutagenesis and converting each of the potential metal binding cysteines to non-binding serines, we can find out which cysteines coordinate the cluster. We expect that converting a metal-binding cysteine to a serine will disrupt metal binding. Three of the seven mutations were made successfully, C438S, C426S, and C426S. NifA harboring the mutations were expressed recombinantly in E. coli and purified. The poster will discuss the effect of the mutations on the metal-cluster formation.

Determining the Structure of Ferredoxin 1 in G. diazotrophicus

Presenter(s): Sophia Ellis

Advisor(s): Dr. Cedric Owens, Michael Medina

The goal of this research is to determine the protein structure of Ferredoxin 1 (FdxN) from the nitrogen fixing organism Gluclonacetobacter diazotrophicus. Nitrogen fixation is essential to all life as the conversion of nitrogen gas (N2) into ammonium (NH3) represents a key entry point for nitrogen into the biosphere. This process is carried out by a subset of bacteria called diazotrophs that express the enzyme nitrogenase. Nitrogenase requires large amounts of reducing equivalents (electrons) to operate. In G. diazotrophicus and other diazotrophs, electrons are delivered to nitrogenase, in large part, using Ferredoxin 1. Soluble Ferredoxins have been shown to act as primary electron donors to nitrogenase in a number of diazotrophic bacteria. If Ferredoxin 1 is knocked out, nitrogenase will not receive the sufficient reducing equivalents in order to convert nitrogen gas into ammonium. The structure of Ferredoxin 1 in G. diazotrophicus is not known. But since it is homologous to other Ferredoxins, we hypothesize that it may contain 2 redox active [4Fe:4S] clusters. If this is the case, Ferredoxin 1 may be able to transfer 2 electrons to nitrogenase at a time, making the enzyme twice as efficient as previously thought. To solve the structure of Ferredoxin 1 and learn about its biophysical properties, we are using crystallography and circular dichroism. Ferredoxin was purified from G. diazotrophicus alongside nitrogenase, concentrated through spin columns, and 96-well and 24-well crystal trays were set up. Crystal screening is ongoing, as no diffraction-quality crystals have been obtained so far.

Oral Presentations- Session I

Wednesday, May 1 | 9:30AM-10:30AM

Argyros Forum

Food Science

Proposed Mechanism by Which Saccharomyces Cerevisiae Induces Inflammation in Inflammatory Bowel Disease and Mitigation of Disease Processes by Dietary Ganglioside

Presenter(s): Jordan Skolnick

Advisor(s): Dr. John Miklavcic

Irritable bowel disease (IBD) is a condition affects 0.5% of the western world is steadily growing. IBD is a condition characterized by chronic inflammation in the gastrointestinal tract with many comorbidities. The current treatments available are expensive and significantly decrease the patient's quality of life. To help combat this, the primary objective of our experiment is to investigate an alternative treatment using dietary gangliosides. Additionally, the secondary objective is to explore the pathology of IBD since it has not yet been established. It has been observed that patients with IBD possess increased levels anti-Saccharomyces Cerevisiae antibody titers. This observation lead us to examine the yeast Saccharomyces Cerevisiae as a potential factor in the development of IBD. Saccharomyces Cerevisiae is commonly found in both baker's and brewer's yeast. This yeast contains mannan in the cell wall that has been shown to have inflammatory effects. In order to test this, a human intestinal cell model consisting of CaCo-2 cells was used. These CaCo-2 cells were exposed to a Saccharomyces Cerevisiae lab and baker's yeast strand lysate for various concentrations and times. The level of inflammation was then assessed by measuring the levels of secreted cytokines IL-1β, IL-6, IL-8, and TNFα. These are inflammatory cytokines that have been shown to be elevated in populations with IBD and are readily secreted by CaCo-2 cells. Following the yeast incubation, dietary gangliosides were then administered and the inflammation was reassessed. We are hoping to observe a significant increase in the secretion of the proinflammatory cytokines following the addition of the yeast strands and a significant decrease in the secretion of the cytokines after gangliosides are administered. This would provide support that indeed Saccharomyces Cerevisiae contributes to the pathogenesis of IBD and that dietary gangliosides are a viable treatment for IBD.

AF 209 C

Biological Sciences

Role of Neuronal Nitric Oxide Synthase (nNOS) in Interferon-Gamma (IFN-gamma)-Induced Melanoma Progression

Presenter(s): Shirley Fong, Bella Sharifi

Advisor(s): Dr. Sun Yang

In recent years, more studies have revealed the pro-tumorigenic activity of interferon (IFN)-gamma in melanoma. Our previous study showed that neuronal nitric oxide synthase (nNOS) plays an important role in melanoma proliferation and metastasis, which is activated by IFN-gamma exposure. The goal of our study is to define the role of nNOS in IFN-gamma-stimulated melanoma progression. Our results show that IFN-gamma markedly induced intracellular nitric oxide levels associated with increased nNOS expression, while such induction was absent with IFN-alpha. Reverse phase protein array analysis demonstrated that IFN-gamma significantly induced PD-L1 expression levels, which was absent post IFN-alpha-treatment. Both STAT1 and STAT3 were activated by IFN-gamma in melanoma cells, which were hindered by the co-treatment of novel nNOS inhibitors. Of note, the induction of PD-L1 by IFN-gamma was also diminished by nNOS inhibitor treatment. Using a xenograft melanoma model, our in vivo studies demonstrated that IFN-gamma-stimulated tumor growth was inhibited by co-administration of nNOS inhibitor MAC-3-190. In addition, nNOS inhibitor HH044 not only effectively inhibited tumor growth but also reduced the expression of PD-L1 in xenograft melanoma tumors. Our study suggests that targeting nNOS-NO pathway using pharmaceutical inhibitors is a novel and effective strategy to improve melanoma treatment.

Development of Novel Apurinic/Apyrimidinic Endonuclease/Redox-Factor 1 Inhibitors for the Treatment of Human Melanoma

Presenter(s): Bella Sharifi, Shirley Fong

Advisor(s): Dr. Sun Yang, Dr. Simin Rahighi, Dr. Miao Zhang

Apurinic/apyrimidinic DNA repair endonuclease-1 (APE-1) is an important DNA excision repair enzyme, also known as Redox Factor-1 (Ref-1). It has been well studied that APE/Ref-1 is involved in the activation of many nuclear transcription factors in a redox-dependent manner. The overexpression of APE/Ref-1 contributes to the development of chemo-resistance and is associated with tumor progression in many human malignancies. Our previous study in melanoma demonstrated that development of novel inhibitors targeting the redox regulation domain of APE/Ref-1 is a promising strategy to improve the treatment of melanoma. The ultimate goal of our study is to develop small molecular inhibitors of APE/Ref-1 utilizing a structure-based approach. First, N-terminally truncated APE/Ref-1 protein lacking the first 40 amino acid residues (Δ40APE1wt) was cloned into the pGEX-6P1 vector to express the GST-tagged fusion protein. After cleavage of GST-tag, the Δ40APE1wt protein was concentrated to 7mM and subjected to protein crystallization. We have successfully diffracted Δ40APE1wt crystals and collected data with resolution up to 1.57Å. The crystal structure was determined by molecular replacement in

Molrep using the already available human APE-1 structure, 5CFG, from the Protein Data Bank (PDB). Currently, soaking of the Δ40APE1wt crystals with potent APE/Ref-1 inhibitors are underway to determine the specific binding characteristics. To the best of our knowledge, very limited successes have been reported in development of potent APE/Ref-1 inhibitors. The structural information collected by our study will be critical to guide further design and synthesis of novel inhibitors targeting APE/Ref-1 to improve cancer treatment.

Sociology

Powerful Women of Rome's Past: Exploring Lesser Known Stories Through The Streets of Rome

Presenter(s): Norma Mendoza
Advisor(s): Dr. Federico Pacchioni

Roman history contains a plethora of powerful and influential female figures, such as Rhea Silvia and the Lupa Romana “she-wolf”, amongst others, that are remembered in art and architecture today. These female figures contributed to Roman history by influencing those in power. These figures, with the exception of a few, were not allowed to hold real positions of authority in Roman society. Therefore, modern Feminist lenses are not fully applicable and a new definition of power has to be adopted in order to investigate the social dynamics that played a role in the influences of these female figures. When the definition of power is modified, the spectrum opens up to important stories of figures such as the Vestal Virgins and the Amazon women. This new definition of power focuses on the everyday lives of these figures and recognizes the impact that lies within their individual actions. These women are constantly portrayed in Roman art and architecture, yet they might not always be considered influential by our standards today. Besides analyzing the portrayal of these women in art, there is also a significant architectural and structural divide that links stories such as that of the Vestal Virgins with the different ways in which men and women were treated in ancient Rome.

Oral Presentations- Session II

Wednesday, May 1 | 11:00AM-12:00PM

Argyros Forum

AF 209 A

Biochemistry and Molecular Biology

Analyzing Nitrogenase's Regulator - NifA's Interaction with DNA

Presenter(s): Heidi Standke

Advisor(s): Dr. Cedric Owens, Michael Medina

The bacterium Gluconacetobacter diazotrophicus contains an enzyme called Nitrogenase which converts dinitrogen gas to ammonia, an essential plant nutrient. The breakdown of dinitrogen has a high energy demand utilizing 16 ATPs and 16 reducing equivalents. For this reason, Nitrogenase is highly regulated (Fisher, 1994). Regulation of Nitrogenase is done by the protein NifA, a sigma-54-activator which binds to DNA through its DNA binding domain (DBD) to activate nitrogen fixation genes (Fisher, 1994). NifA itself has been shown to be responsive to high oxygen and nitrogen levels, however the function of NifA is not fully understood. It is not known if NifA is directly an oxygen sensor or if it senses whether sufficient reducing equivalents are present for nitrogenase to operate. There are two cysteines at the start of NifA's DNA binding domain. Cysteines are redox active and oxidize to form disulfide bonds which are known to affect protein activity. It remains unclear if these cysteines sense oxygen and/or redox conditions and if this potential sensing mechanism effects NifA's DNA binding, since the structure and mechanism of NifA's interaction with DNA is not well understood. The goal of this project was to determine if the two cysteines are redox active and/or O2 sensors and how the redox state of the cysteines influences NifA's interaction with DNA. To test the hypothesis that NifA's DNA binding is affected by oxygen and/or redox levels, two constructs of NifA's DBD were made: one containing neither cysteines (No-Cys) and another containing both cysteines (2-Cys). Both the No-Cys and 2-Cys constructs were cloned into expression plasmids, expressed heterologously in E. coli, purified, and functionally examined through DNA binding assays and biophysical methods. We hypothesize that if NifA is a redox/O2 sensor, it will only be active when both cysteines are reduced. Our results will enable us to understand how NifA regulates Nitrogenase expression in the presence of oxygen and allow us to know under which conditions G. diazotrophicus produces ammonia.

Sociology

Dating Soyboys: Women's View of Veg* Men in Romantic Relationships

Presenter(s): Aidan Jones

Advisor(s): Dr. Ashley Kranjac

As more men attempt vegan or vegetarian (collectively referred to as veg*) lifestyles, the historic link between meat and masculinity has become more pronounced. Women tend to gravitate toward several traits associated with veg* diets (e.g., compassion and health). However, the emasculation associated with these diets may also repel them. This project utilized a mixed-methods analysis. It uses survey data and in-depth, one-on-one interviews with eight women who have dated veg* men. Subjects were recruited using convenience sampling from personal social networks and veg* conferences. The present

study explores how heterosexual and bisexual women come to terms with the positive qualities and emasculation that both accompany men who follow veg* lifestyles. Findings indicate that most women tended to view veg* diets as a masculine strength as well as an indicator of kindness. For example, some women recognize the difficulty of adhering to a veg* lifestyle as a man and see it as a marker of masculine strength. Utilizing aspects of veg* lifestyles might improve the health of all as well as the environment. Therefore, removing the stigma associated with these lifestyles may help improve the lives of all individuals regardless of gender identity.

AF 209 B

Art

Casteism in Contemporary Indian Art

Presenter(s): Prabhnoor Kaur

Advisor(s): Dr. Wendy Salmond

Caste runs like a series of fault lines in Indian society, invisible to those who have the privilege of ignoring it yet rumbling beneath the socio-political sphere that effects everyone. Based on the Hindu texts, caste reflects the concept of Varna, which divides people into four categories based on their professions. These are the Brahmans (priests), Kshatriyas (nobles/warriors), Vaishyas (farmers), and Shudras (slaves). Within each of these categories are castes (further separated into sub-castes), and have their own hierarchal relations. Still today, the lower castes, or Dalits, typically find themselves restricted to more labor-based jobs, such as civil service. My research looks at the work of two contemporary Dalit artists, Vinu VV and Rajyashri Goody, and frames them within the larger conversation around caste. Vinu VV's installations, "Noon Rest" (2014) and "OCHA" (2018), addresses the poetics and revolts of Dalits; Goody centers her installation "What is the Caste of Water?" (2017) and video installation "Namak Halal" (2017) around resistance in Dalit food practices. I approach their works from an intersectional feminist perspective, examining how different systems of privilege bleed into one another and uniquely color the voice of their work, as well as how their works are received and written about within a global context.

Don't Tell Me to Smile

Artist: Nicole Daskas

Advisor(s): Micol Hebron

"Don't Tell Me To Smile" is a video piece in which I perform a visual representation of the feeling of being expected to smile through everything. The video confronts the oppressive nature of the expectation of women to "put on a pretty face", and smile through their pain to keep those around them happy. Women's roles throughout history have been about care taking, and women's worth is often seen in her beauty. A woman who shows her anger is not considered pleasing to look at, and all of these expectations and ways of silencing women are shown through metaphor in the video. The different materials that fill and spill out of my mouth, preventing me from being able to smile or look pretty, serve as a visual representation of how it feels to be silenced. “Don’t Tell Me to Smile” is also a response to catcalling. It

reflects on the feeling of walking down the street when someone calls out, “smile for me!” or “you’d look prettier if you smiled!” Catcalling is a very prevalent issue, yet it is not talked about much because the question of how to stop catcalling is an extremely tricky one. Catcallers, when provoked, can become dangerous. This video piece confronts the issue head-on and asks viewers to think about the burdensome expectations placed on women.

Theatre

Staged Seminar - Luis Valdez's Zoot Suit

Presenter(s): Zacharias Estrada
Advisor(s): Dr. Jocelyn Buckner

Combining the lessons of the v-effekt in Brecht’s Epic Theatre and Boal’s encouragement of the “spect-actor” in Theatre of the Oppressed, the Staged Seminar is a critical, active reading of a dramatic work as it is happening. Stylistically inspired by the “absurd realism” of Taylor Mac’s Hir and what I have coined the “deadpan satire” of Brandon Jacobs-Jenkins’ Appropriate, the format is intended as a way of bridging the gap between admittedly dense academic material with the immediacy and relatability of theatre. Here, the practitioner is challenged to use performance as a vehicle for engagement with a social topic they deem important, while still paying attention to the Aristotlean aspects that define dramatic theory. It is a disagreement with Epic Theatre’s proposition that the audience should feel “alienated” when in performance - such a stance is contradictory to the very dialectical nature of performance. If theatre is a conversation between first the creators and then the audience, then the conversation should at least make use of the rhetorical tools that make theatre engaging. This research project looks to develop the idea of the Staged Seminar by applying it to Luis Valdez’s 1978 Zoot Suit. Using the aforementioned concepts, the Staged Seminar uses the play to engage with the question of toxic masculinity, and more specifically, Machismo/Marionismo culture within the Latinx community. For over 2000 years, drama has been a key democratic device in shaping cultures: a society is both defined by the stories they make and the stories they see. The Staged Seminar then, is a way of including both the makers and the see-ers in the process even more prominently. This research project combines intersectional feminist theory, criticism of Machismo/Marionismo, close readings of four plays within the Latinx theatre canon, and one outside (Hir). This abstract proposes a live excerpt of the Staged Seminar at this year's Student Scholar Symposium.

Oral Presentations- Session II

Wednesday, May 1 | 11:00AM-12:00PM

Argyros Forum

AF 209 C

Art

Who is Responsible for Global Warming?

Artist: Kamy Arakawa

Advisor(s): Micol Hebron

This is a 18 x 24 inch social justice poster, inspired by Barbara Kruger, that focuses on the issue of global warming. The poster contains a black and white photograph with "This is our responsibility" written in white and outlined in red boxes. The background photograph is of a polar bear that is surrounded by melting ice pieces. Barbara Kruger is well known for combining text and image to convey a direct critique of an issue. I was inspired by her aesthetic and wanted to emulate the same strength behind a single statement for my poster. Global warming has been increasing at an alarming rate, yet there are people who still do not believe it is real or that it can be stopped. The message on my poster is directed towards that group. If we do not start taking responsibility of our actions, we will be stuck in a vicious loop of denying and blaming others. I believe that we need to put more effort into cultivating the same perspective and mentality about global warming before we can make any progress in trying to reverse the damage we have caused.

Welcome Graduating Class ;

Artist: Alexis Espinosa

Advisor(s): Micol Hebron

This is a digital design poster, 24 x 36 inches, printed with Digital Ink Jet. The design inspiration come from Victor Moscoso. A Northern California artist who specializes in making psychedelic posters and advertisement during the 60's and 70's. The title of this poster is Welcome Graduating Class ;. It is a social justice poster that addresses the issue of teen suicide. Despite the efforts of preventing teen suicide and trying to notice all the signs in teen, more and more commit suicide through the years. There are many factors that could lead a kid or teen to commit suicide. It is never one key factor that all teens and kids share. It is not just social media, it is not just bullying, it is not just their mental health. It a mass amount of issue that kids and teens shouldn't be carrying on their shoulder in the first place. The poster shows the imagery of a graduating class. The color scheme has been edited to create a more complementary color balance, as well as changing the lighting and contour of the original image. On the students, 10 out of 11 have orange markings crossed out on their faces. Only one student off to the far left has a clear face and a semicolon drawn on his person. Above the students is the text saying "Welcome Graduating Class ;" in the same color as the markings on the student's faces. A key design the the text is the slash going through it. It emphasizes the fact that there is no graduating class so it is implied they didn't make it. The semicolon, however, is not just an aesthetic element for the text. The semicolon is the symbol for suicide prevention in the United States. Symbolizing not the end of a life but a continuation. The student clear of markings on his face and a semicolon on his chest is implied to have been the only one to survive. The background of muted blue with floral and lined pattern was inspired from Victor Moscoso work in creating patterns around the main subject. The pattern helps keep the viewers eyes directed on the semi colon and the students.

Oral Presentations- Session II

Wednesday, May 1 | 11:00AM-12:00PM

Argyros Forum

Sociology

A Message from the President

Artist: Corinne Tam

Advisor(s): CK Magliola

"A Message from the President" is a truth, for the words written on this flag are all words that have come from the President's mouth at some point in time. I arrange individual quotes ranging from years before he took the oath of office to his current presidency together with three goals in mind: to transparently present just a handful of the innumerable ways he has objectified, dehumanized, and belittled women, to communicate the impact he has as today's chief representative of the country, and to convey the blatant bigotry in his character. Inspiration for this piece stemmed from multiple places, primarily the works of an artist named Jenny Holzer, who utilizes words and public spaces in order to communicate ideas. To many of us, the president's comments are completely appalling. To others, it is more difficult to understand the impact of these comments within each situation. By removing what I found to be some of the most glaring comments he has made out of context, and put them all together to create a new context, I hope to interrupt what may be one's acceptance of his words and display them in a new, more revealing space.

Poster Presentations- Session I

Wednesday, May 1 | 1:30PM-3:00PM

Sandhu Conference Center

Art

1. **A Historicized Redesign of a Hypothetical Live-Action Adaptation of Walt Disney's Sleeping Beauty**
   Presenter(s): Kelly Broderick
   Advisor(s): Dr. Wendy Salmond

No film exists in a cultural vacuum. The appearance of a film reflects both the time it is meant to be portraying and the time when it was made. One of the key ways in which this is displayed is through costume design. In Walt Disney Studios' 1959 film Sleeping Beauty, every costume worn by a character was meticulously designed in order to establish a cohesive visual story-world. The film's animators and artists, particularly concept artist Eyvind Earle, crafted a unique medieval aesthetic through the costume design, inspired by medieval art, Pre-Raphaelite medievalist imagery, and popular American 1950's style trends from the time of the film's production. The resulting costumes possess visual elements from a variety of sources and inspirations, and are even occasionally anachronistic for the Western European High Middle Ages. As Disney has recently begun to adapt many of their animated features into live-action films, I propose a live-action version of Sleeping Beauty, with newly-designed historically accurate costumes for the story's main characters. My design process for doing so involves examining the animated film and its screenplay in order to maintain a recognizable aesthetic and translate it into a three-dimensional reality. As the animated film never establishes a geographical or time setting, I have chosen to base the film in late 14th-century England. As this film would be made in the 21st century, it would reflect the current zeitgeist instead of that of the 1950's, and the corresponding American contemporary sociocultural ideas on what is visually beautiful and perceived as "medieval". The culmination of my research will be presented in the format of a Scalar digital presentation and a poster, displaying hand-drawn sketches of my original costume designs, along with written analysis of both the original film's designs and the reasoning behind my own design choices.

Biochemistry and Molecular Biology

2. **Mechanism of Action Studies of a Diarylpentanoid that Down-Regulates the Androgen Receptor in Prostate Cancer Cells**
   Presenter(s): Alejandra Solis
   Advisor(s): Dr. Marco Bisoffi

In this project we are studying the diarylpentanoid ca27, which is a synthetic analog of the natural product curcumin. ca27 has previously been shown to down-regulate the androgen receptor (AR), which is a prominent therapeutic target in the treatment of prostate cancer. However, the mechanism of action of ca27 is not yet understood. The purpose is to investigate whether ca27 works at the translational level to down regulate the activity of the androgen receptor. The use of compounds that inhibit transcription and protein degradation will allow us to determine if ca27 has any effect on translation. We cultured human LNCaP prostate cancer cells and treated them with the following inhibitors: Transcriptional inhibitor Actinomycin D (ActD) and protein degradation inhibitor MG132. To determine the effect of ca27, these

treatments were performed in the absence or presence of the diarylpentanoid. Protein lysates were generated, their concentration were determined, and the proteins were separated by gel electrophoresis. Western blotting analysis with specific antibodies for the AR and β-actin as a housekeeping protein, as well as qRT-PCR using specific primers were used to determine AR expression. Our initial results show that ca27 negatively affects AR translation. Together with other ongoing studies, this result contributes to the elucidation of the mechanism of action of ca27. The latter is important for guiding drug-design efforts based on the structure of ca27.

3. **Exploring the Physical Interaction Between Curcumin Analog CA27 and the Androgen Receptor**

   Presenter(s): Emma Whiteley

   Advisor(s): Dr. Marco Bisoffi

A key player in prostate cancer development and progression is the androgen receptor (AR). AR overexpression at both the protein and mRNA levels are seen in the majority of castration-resistant prostate cancers. The AR is activated by the binding of androgenic hormones like testosterone and dihydrotestosterone (DHT) to its ligand-binding domain (LBD). Inhibition of AR protein function is a potential therapeutic target for prostate cancer. This research project focuses on a specific ligand: curcumin analog 27 (ca27), which has been shown in previous studies to downregulate AR protein expression and function. This research project focuses on the mechanism of action of ca27. Specifically, we are investigating the physical interaction between ca27 and the AR-LBD in vitro using two methods. A competitor fluorescence polarization (FP) assay was used to quantify the physical interaction between ca27 and its analogs with the AR. In this assay, effective competitors, such as the androgens DHT and R1881, bind the AR-LBD and displace the pre-bound fluorophore fluoromone. The FP show ca27 does not displace fluoromone and it appears that ca27 does not physically interact with the AR at the LBD. To further investigate this finding, we employed the drug affinity response target stability (DARTS) assay. LNCaP cells were treated with DHT, pyrvinium pamoate (a known noncompetitive AR inhibitor), or ca27 to see whether there is physical interaction at the AR DNA-binding domain (DBD) or LBD. These experimental results will also be complemented by computational modeling of ca27 and the AR.

4. **Molecular Docking Model of the Inhibition of Cancer Growth in Human AR using CA27**

   Presenter(s): Jarett Guillow

   Advisor(s): Dr. Marco Bisoffi

The concept being applied is based off of Dr. Bisoffi's research on CA27 and it's binding to the Androgen Receptor (AR) to inhibit cancer growth. The AR in humans is often found bound to its natural ligand, dihydrotestosterone (DHT). However, it is known that when the AR receptor instead is bound to CA27, the cancer growth is inhibited. The purpose of my research was to discover the statistical likelihood of CA27 binding to the AR instead of DHT and to visualize this using MolSoft with other analogs and derivatives. The results of this study will hopefully help to understand the chemical processes involved during these reactions and determine the scenarios that will best lead to inhibition of cancer growth. Using MolSoft, CA27 along with a list of its analogs were inputted into both the ligand binding domain (LBD) and the DNA binding domain (DBD) to see which would be more preferable. In the ligand binding

domain, CA27 did bind relatively strongly to the AR however, multiple of its analogs (in particular c58, which has meta-positioned –OH groups) bound stronger, leading to questions that need to be asked about their chemical properties. In the DNA binding domain, the same scenario arouse however, the difference between CA27 and its analogs was not near as drastic and there was no particular analog which stood out. Comparing the LBD and the DBD, the differences were not too dramatic however; there was indeed stronger binding to the DBD, possibly indicating the final location of the binding to inhibit cancer growth. Further research and analysis will need to be done to determine why certain analogs bound more tightly than CA27 and what chemical effects these different scenarios will bring with it.

5. **Mechanism of Action Studies of the Diarylpentanoid Ca27 that Downregulates The Androgen Receptor In Prostate Cancer Cells**

   Presenter(s): Samantha Dyer

   Advisor(s): Dr. Marco Bisoffi

Prostate cancer is one of leading causes of cancer related deaths for men with a lifetime risk of one in nine. Current treatment methods involve prostatectomy, aka removing the prostate which can cause serious side effects such as impotence and incontinence, or chemical androgen receptor (AR) block, the protein that promotes prostate cancer. We are investigating curcumin analog 27 (ca27), a synthetic analog of the natural product curcumin. Previously, ca27 has been shown to downregulate the AR which is a therapeutic target in the treatment of prostate cancer. However, little is known about the mechanism of action by which ca27 downregulates the AR. Our work investigates whether ca27 works at the transcriptional level to downregulate the activity of the AR. Human prostate cancer cells were cultured and treated with ca27, cycloheximide, and MG132. Cycloheximide is used to inhibit transcription by binding to ribosomes , while MG132 is used to inhibit protein degradation by inhibiting the proteasome. By inhibiting transcription and degradation, mRNA coding for the AR protein is still transcribed, but not translated. Furthermore, AR protein that is already present in the cells is not being degraded. This allows for the study of the effects of ca27 at the transcriptional level through Western blot analysis and qRT-PCR. Our initial results show that ca27 affects the transcription of AR mRNA.

6. **Synthesis of Breast Cancer Targeting Peptide Analog "GE11"**

   Presenter(s): Andrew Pham

   Advisor(s): Dr. Kamaljit Kaur

Chemotherapy is a potent, yet indiscriminate method of treatment. Patients undergoing chemotherapy will often experience large periods of recovery time as a direct result of the drugs affecting diseased and healthy tissue. The goal of this project is to synthesize peptide-drug conjugates that will increase the therapeutic efficacy of current chemotherapeutic drugs, like Doxorubicin, by delivering the drug specifically to cancer sites while sparing healthy cells. Over the course of this project, two modes of synthesis were explored to synthesize the breast cancer targeting peptide, namely, manual and automatic. A cyclic peptide “GE11” analog was designed, synthesized and characterized. In addition to testing the effectiveness of the peptide, it was found that automatic synthesis using the Tribute Synthesizer yielded the best results in terms of time efficiency and peptide accuracy.

7. Structure-Function Analysis of Metal Clusters in NifA

Presenter(s): Ashna Shah, Sarah Amaya, Justyn Golobic, Hiba Zaidi

Advisor(s): Dr. Cedric Owens

Ammonia is a very important plant nutrient; it is produced biologically in bacteria by the enzyme nitrogenase. Generating ammonia in bacteria requires a large amount of energy in the form of ATP and reducing equivalents. Therefore, the reaction is heavily regulated by transcription factors that only turn on nitrogenase when it is needed. The sigma-54 activator NifA is the main mediator of nitrogenase expression. It turns on transcription when ammonia levels are low and sufficient reducing equivalents are present. Sensing reducing equivalents in NifA depends on several metal clusters that are bound to the protein. The location and redox sensing mechanism of these metal clusters are, however, unknown. The overall goal of this project is to determine the location of the metal clusters in NifA. Specifically, we want to know which cysteine residues coordinate the metal clusters. NifA contains seven cysteines. By conducting site-directed mutagenesis and converting each of the potential metal binding cysteines to non-binding serines, we can find out which cysteines coordinate the cluster. We expect that converting a metal-binding cysteine to a serine will disrupt metal binding. Three of the seven mutations were made successfully, C438S, C426S, and C426S. NifA harboring the mutations were expressed recombinantly in E. coli and purified. The poster will discuss the effect of the mutations on the metal-cluster formation.

8. Identification and Classification of Redox Sensing Mechanisms in Nifa

Presenter(s): Hiba Zaidi, Justyn Golobic, Sarah Amaya, Ashna Shah

Advisor(s): Dr. Cedric Owens

The enzyme nitrogenase converts dinitrogen gas to ammonia in a process called nitrogen fixation. This process in important because ammonia is a biosynthetic precursor for molecules such as DNA and amino acids. Ammonia is major source of nitrogen in plants. Even though nitrogen fixation is such an important process, many aspects of its regulation are not known. Nitrogenase is transcribed when nitrogen levels in the cell are low and there are sufficient reducing equivalents present. NifA senses nitrogen and redox levels, however, the mechanism of redox sensing isn't understood. It is hypothesized that NifA binds a metal cluster via its cysteine residues, and that the metal cluster is involved in redox sensing. NifA has are seven potential metal binding cysteines that may be redox active themselves or bind a redox active metal cluster such as an iron-sulfur cluster. In order to better understand how this process occurs and which cysteines have an active role in it, cysteine point mutations were made using PCR. These point mutations convert cysteine to serine, which are not metal binding. Therefore, mutating a metal binding cysteine to a serine would likely abolish metal cluster formation. We have made two cysteines to serine mutations (C438S and C426S) in full length NifA while one was made in a truncated NifA construct, which lacked the N-terminal(C463S). All NifA variants were expressed recombinantly in E. coli and could be purified. If these cysteines are removed, then the E. coli will no longer be able to produce a metal cluster which could then be related to the redox sensing properties of NifA. Analysis of the metal cluster binding ability of the mutants is ongoing and will be discussed in the poster.

9. The Functionality of Metal Binding Sulfur Clusters in NifA Analysis

Presenter(s): Sarah Amaya, Ashna Shah, Justyn Golobic, Hiba Zaidi

Advisor(s): Dr. Cedric Owens

Ammonia is a very important plant nutrient. Ammonia is produced biologically in bacteria by the enzyme nitrogenase. Generating ammonia in bacteria requires large amounts of energy, and therefore the reaction is highly regulated. The principal regulator of nitrogenase is the protein NifA. NifA-mediated regulation is hypothesized to depend on several metal clusters that are bound to the protein and sense if sufficient reducing equivalents are present for nitrogenase to operate. The location and role of the metal clusters, however, is unknown. There are 7 total cysteines in NifA, however, which one or ones are functionally important for cluster binding is unknown. The goal of this project is to determine which cysteines are required for iron sulfur clusters binding. In order to determine which of cysteines are essential for the formation of the iron-sulfur clusters, the seven cysteines will be changed to non-coordinating serines, thereby abolishing metal cluster binding if the mutated cysteine is indeed involved in cluster binding. As of now, 3 mutations were successfully made: C438S and C426S in full-length NifA and 1 C426S in an N-terminally truncated version of NifA. These mutants were heterologously expressed in E. coli and purified. We are now testing the effects of the Cysteine mutations on NifA's structure and ability to bind a metal cluster, and the results will be discussed.

10. Expression and Purification of Nitrogenase from Gluconacetobacter Diazotrophicus

Presenter(s): Chloe Nicole Garcia, Kiersten Chong, Terrence Lee

Advisor(s): Dr. Cedric Owens

Nitrogen fixation is one of the most important processes within nature and is essential for all living organisms since nitrogen is a building block for amino acids and DNA. As atmospheric nitrogen (N2) is absorbed into the soil, bacteria known as diazotrophs have the ability to convert N2 into ammonia (NH3), a biosynthetic precursor, via the enzyme nitrogenase. In addition to reducing N2 to NH3, nitrogenase has the ability to reduce carbon monoxide (CO) to hydrocarbons. In order to study the complex chemistry of nitrogenase, the enzyme is grown in our model organism, Gluconacetobacter diazotrophicus. Cells are then lysed via microfluidization using lysis buffers. The cell-free extract is then spun down in a centrifuge and the supernatant is collected anaerobically. From this point onwards, all steps must be done anaerobically to prevent oxygen damage to the protein's metal structures. For protein purification, buffers are first degassed and placed under anaerobic conditions, and a reducing agent is added. The nitrogenase containing supernatant is then purified using ion exchange and gel filtration column with the degassed buffers, to purify nitrogenase by charge and size, respectively. The purity of the protein is then assessed using gel electrophoresis which can identify the nitrogenase and any impurities within the fraction. Purified nitrogenase will be used for interaction studies with CowN to determine how CowN influences nitrogenase's reactivity with CO.

11. Preventing CO Inhibition of Nitrogen Fixation with CowN

Presenter(s): Kiersten Chong

Advisor(s): Dr. Cedric Owens

Nitrogen fixation, the reduction of atmospheric nitrogen to ammonia, occurs naturally in certain bacteria, such as Gluconacetobacter diazotrophicus, via nitrogenase, a multisubunit enzyme with an iron-protein unit (FeP) and a molybdenum-iron-protein unit (MoFeP). Nitrogenase is inhibited by carbon monoxide (CO). CO levels in the soil are sufficient to inhibit nitrogenase and prevent nitrogen fixation. However, G. diazotrophicus also produces a protein, CowN, that may prevent CO inhibition of nitrogenase. This research attempts to understand how CowN prevents CO inhibition. We hypothesize that CowN and nitrogenase interact, thereby preventing CO binding to nitrogenase or enabling nitrogenase to catalytically remove CO. Anaerobic purification of nitrogenase via anion exchange followed by gel filtration was successful in obtaining MoFeP but not FeP. MoFeP was used in an EDC cross-linking study with CowN to test if nitrogenase and CowN interact. No evidence of cross-linking was observed; however, this may be due to absence of FeP, insufficient concentrations of MoFeP and CowN, an inappropriate cross-linker, or a combination of these factors. In vivo studies with G. diazotrophicus measuring nitrogenase activity via the reduction of acetylene to ethylene in the presence and absence of CO showed that CO does, in fact, inhibit nitrogenase activity. However, inhibition occurred at CO concentrations higher than those for purified nitrogenase protein, suggesting that G. diazotrophicus can protect itself from CO. Additional assays tested if nitrogenase reduces CO to hydrocarbons to test the hypothesis that CowN enables catalytic removal of CO. While no hydrocarbon formation was observed, further studies are required. This research has long-range importance. G. diazotrophicus, which is found naturally among crops such as sugarcane, could be engineered to have greater CO tolerance and create more ammonia than a wild type cell for plant fertilization. Evidence of CO reduction to hydrocarbons by nitrogenase could also lead to the use of nitrogen-fixing bacteria as air scrubbers.

12. Characterizing How G. Diazotrophicus Nitrogenase Protects Itself from Inhibition by Carbon Monoxide

Presenter(s): Terrence Lee

Advisor(s): Dr. Cedric Owens

Nitrogen fixation is the process of converting atmospheric nitrogen gas into biologically usable nitrogen compounds, such as ammonia. The industrial route to ammonia production, known as the Haber-Bosch process, requires high temperatures and high pressures. Thus, there is a great interest in studying biological metabolic pathways that make ammonia as a more sustainable source for this important plant nutrient. The key enzyme responsible for biological nitrogen fixation is nitrogenase. One of the most common forms of the enzyme, Molybdenum nitrogenase (Mo-nitrogenase), is inhibited by carbon monoxide gas, which can be found in high concentrations in the soil. However, certain versions of this enzyme that contain vanadium (V-nitrogenase) instead of molybdenum are capable of converting carbon monoxide into hydrocarbon products. The fact that V-nitrogenase can use carbon monoxide as a substrate while Mo-nitrogenase cannot raises the question of how bacteria that rely solely on Mo nitrogenase, such as Gluconacetobacter diazotrophicus, survive in presence of carbon monoxide. In these Mo-nitrogenase-only organisms, a protein known as CowN is thought to protect the enzyme. This is revealed by the deletion of its respective gene cowN, which resulted in significantly impaired nitrogenase-dependent growth under CO gas in these Mo-nitrogenase-only organisms. While this indicates that CowN aids in

protecting Mo-nitrogenase, the details of CowN's mechanism have yet to be uncovered. We hypothesize that CowN enables Mo-nitrogenase to assume properties akin to V-nitrogenase and escape inhibition from carbon monoxide by reducing it to hydrocarbons for a different pathway. Here, we characterize how CowN influences nitrogenase activity in presence of carbon monoxide in Gluconacetobacter diazotrophicus. We have purified CowN to homogeneity and shown that it is folded, and have also purified the MoFe protein component of nitrogenase. We will also discuss potential interaction between CowN and Mo-nitrogenase and whether CowN enables carbon monoxide reduction by Mo-nitrogenase.

13. **Analyzing Nitrogenase's Regulator - NifA's Interaction with DNA**

Presenter(s): Heidi Standke
Advisor(s): Dr. Cedric Owens, Michael Medina

The bacterium Gluconacetobacter diazotrophicus contains an enzyme called Nitrogenase which converts dinitrogen gas to ammonia, an essential plant nutrient. The breakdown of dinitrogen has a high energy demand, utilizing 16 ATPs and 16 reducing equivalents. For this reason, Nitrogenase is highly regulated (Fisher, 1994). Regulation of Nitrogenase is done by the protein NifA, a sigma-54-activator which binds to DNA through its DNA binding domain (DBD) to activate nitrogen fixation genes (Fisher, 1994). NifA itself has been shown to be responsive to high oxygen and nitrogen levels, however the function of NifA is not fully understood. It is not known if NifA is directly an oxygen sensor or if it senses whether sufficient reducing equivalents are present for nitrogenase to operate. There are two cysteines at the start of NifA's DNA binding domain. Cysteines are redox active and oxidize to form disulfide bonds which are known to affect protein activity. It remains unclear if these cysteines sense oxygen and/or redox conditions and if this potential sensing mechanism effects NifA's DNA binding, since the structure and mechanism of NifA's interaction with DNA is not well understood. The goal of this project was to determine if the two cysteines are redox active and/or O2 sensors and how the redox state of the cysteines influences NifA's interaction with DNA. To test the hypothesis that NifA's DNA binding is affected by oxygen and/or redox levels, two constructs of NifA's DBD were made: one containing neither cysteines (No-Cys) and another containing both cysteines (2-Cys). Both the No-Cys and 2-Cys constructs were cloned into expression plasmids, expressed heterologously in E. coli, purified, and functionally examined through DNA binding assays and biophysical methods. We hypothesize that if NifA is a redox/O2 sensor, it will only be active when both cysteines are reduced. Our results will enable us to understand how NifA regulates Nitrogenase expression in the presence of oxygen and allow us to know under which conditions G. diazotrophicus produces ammonia.

14. **Protein Interactions Between Calmodulin and Alpha-Synuclein**

Presenter(s): Justin Nako
Advisor(s): Dr. Jerry LaRue, Dr. Cedric Owens

With over 10 million cases worldwide, Parkinson's disease (PD) is the second most common neurodegenerative disease in the world. Alpha-synuclein (α-syn) is a protein that has been associated with neurotransmitter signaling in the brain. Although the exact function of alpha-synuclein is still unknown, it is known to be found on the ends on neurons in healthy patients. α-syn can aggregate which forms the main structure for a Lewy bodies, which are found in the cranial nerve cells of PD patients. Lewy bodies

gather at the pre-synaptic terminal of motor neurons and have been associated with the physical disabilities PD patients display. α-synuclein is known to interact with calmodulin (CaM), a calcium binding messenger protein. CaM is a protein with two binding domains that separately bind to other molecules depending on the environment. The interaction between these two proteins has recently been shown to result in α-syn aggregation, especially in the presence of calcium (Ca2+). Ca2+ causes CaM to go under a conformational change which makes it more capable of binding with α-synuclein at both of its binding domains. Recent studies show CaM binds to α-syn, which causes α-syn to have a conformational change causing the aggregation of protein forming Lewy bodies. However, the exact mechanisms and functions of α-synuclein, CaM, and Lewy bodies are still being researched. To study this protein interaction, fluorescence spectroscopy, anisotropic fluorescence spectroscopy, and circular dichroism spectroscopy will be used to learn more about how calcium affects the proteins' binding and how the binding domains of the proteins interact. The end goal is to understand how the presence of Ca2+ affects binding between both domains of CaM and α-syn. This may lead to further work looking into the treatment of PD through the inhibition of Lewy body formation.

15. **Effects of Tyrosine on the Productivity of PC12 Cells by Measuring ATP Release**
    Presenter(s): Mary Rapmund, Sabrina Burkholder, David Fogel, Jon Flees
    Advisor(s): Dr. Rennolds Ostrom, Dr. Shana Welles

The amino acid tyrosine was seen to increase and neutralize catecholamine levels (i.e. dopamine, epinephrine, and norepinephrine) in the brain, which are produced when the body is under stress, allowing it to prepare for a flight or flight reaction. They are also tied to the ability to focus and perform. Furthermore, tyrosine is the precursor for L-Dopamine, so adding more of this compound to a person's diet would allow natural bodily mechanisms to increase the catecholamines and, therefore, neurotransmitter levels, leading to an overall increase in focus as well as mental ability and performance. Using ATP production as a measurement of cellular performance in PC12 cells (from the adrenal gland tumor of a rat), an ATP assay experiment using bioluminescence allowed quantitative productivity data to be collected in cells treated with tyrosine and untreated cells. The relative light units (RLU) produced when fluorescence resonance energy transfer (FRET)-based ATP indicators illuminates the ATP within the cell, allowing visualization of its level of production within cellular processes. The cell's relative level of productivity is measured using a luminometer, and potassium chloride (KCl) is added for a stimulant for cellular ATP production. The results showed a higher ATP release in the cells treated with tyrosine after the KCl of the assay kit is added to the wells.

16. **The Effects of Ashtanga Yoga on Obesogenic Biomarkers**
    Presenter(s): Nathalie Schweiger
    Advisor(s): Dr. Marcia Abbott

Obesity is a growing health issue in the United States that is associated with adverse health conditions. Common treatments for obesity, physical exercise and calorie restriction, require lifestyle alterations that are difficult to maintain. Yoga is a form of physical exercise that yields lower attrition rates than more "traditional" modalities of exercise. Therefore, yoga may be a sustainable prevention and/or treatment for obesity. Adipokines, cytokines secreted from adipose tissue, are induced with exercise and act to

increase metabolism. The objective of the current study was to assess alterations in circulating adipokines, adiponectin and leptin, following a single session of Ashtanga yoga. We hypothesized that both adiponectin and leptin would increase in circulation following a yoga session. Participants (n=9) were recruited to perform a single bout of Ashtanga yoga (1.5 hours) and a control session. Blood and saliva samples were collected before and after the yoga session. The order of the control (C) and yoga (Y) sessions were randomized. Adiponectin levels were measured in the saliva, via ELISA, in the pre-C, post-C, pre-Y, and post-Y sessions. The blood samples were analyzed for total cholesterol (TC), HDL, triglycerides (TG) and glucose. A student's paired t-test ($P<0.05$) was utilized to determine any significant differences in the sessions Y and C sessions. Yoga had no effect ($P>0.05$) on any of the circulating lipids and blood glucose (pre-C vs post-C; pre-Y vs post-Y). Additionally, the C session had no effects ($P>0.05$) on circulating adiponectin levels and samples collected from the Y session will be assessed. Identifying successful treatments for obesity is required in order to prevent its associated metabolic disorders. Here we show that Ashtanga yoga may act as an alternative to other exercise modalities. However, it has yet to be established if Ashtanga yoga yields the same long-term effects as other methods of exercise.

17. **Determining the Structure of Ferredoxin 1 in G. diazotrophicus**

Presenter(s): Sophia Ellis
Advisor(s): Dr. Cedric Owens, Michael Medina

The goal of this research is to determine the protein structure of Ferredoxin 1 (FdxN) from the nitrogen fixing organism Gluclonacetobacter diazotrophicus. Nitrogen fixation is essential to all life as the conversion of nitrogen gas (N2) into ammonium (NH3) represents a key entry point for nitrogen into the biosphere. This process is carried out by a subset of bacteria called diazotrophs that express the enzyme nitrogenase. Nitrogenase requires large amounts of reducing equivalents (electrons) to operate. In G. diazotrophicus and other diazotrophs, electrons are delivered to nitrogenase, in large part, using Ferredoxin 1. Soluble Ferredoxins have been shown to act as primary electron donors to nitrogenase in a number of diazotrophic bacteria. If Ferredoxin 1 is knocked out, nitrogenase will not receive the sufficient reducing equivalents in order to convert nitrogen gas into ammonium. The structure of Ferredoxin 1 in G. diazotrophicus is not known. But since it is homologous to other Ferredoxins, we hypothesize that it may contain 2 redox active [4Fe:4S] clusters. If this is the case, Ferredoxin 1 may be able to transfer 2 electrons to nitrogenase at a time, making the enzyme twice as efficient as previously thought. To solve the structure of Ferredoxin 1 and learn about its biophysical properties, we are using crystallography and circular dichroism. Ferredoxin was purified from G. diazotrophicus alongside nitrogenase, concentrated through spin columns, and 96-well and 24-well crystal trays were set up. Crystal screening is ongoing, as no diffraction-quality crystals have been obtained so far.

18. **Pilot Study of DNA Methylation-Derived Neutrophil-To-Lymphocyte Ratio and Survival in Pediatric Medulloblastoma**

Presenter(s): Vidal Arroyo

Advisor(s): Dr. Austin Brown, Dr. Philip Lupo, Dr. Surya Rednam, Dr. Jeffrey Murray, Dr. Mehmet Okcu, Dr. Murali Chintagumpala

Introduction: Methylation-derived neutrophil-to-lymphocyte ratio (mdNLR) has been identified as a potential prognostic biomarker of outcomes in various cancers. We evaluated the prognostic value of blood-derived mdNLR within a retrospective cohort of pediatric medulloblastoma patients. Materials and methods: DNA methylation was measured in archival peripheral blood samples collected on 56 pediatric medulloblastoma patients. Hazard ratios (HR) and 95% confidence intervals (CI) for the association between mdNLR and survival were evaluated using Cox proportional hazard models. Results: Compared to patients who were alive at last follow-up (n=43), the mean mdNLR value was slightly higher in deceased patients (n=13) (12.3 vs. 5.2,P=0.163). Elevated log-transformed mdNLR was suggestively associated with an increased likelihood of death in unadjusted models (HR=1.43, 95%CI: 0.92–2.22) and significantly associated with mortality in adjusted models (HR=1.61, 95%CI: 1.01–2.58). Discussion: Future work is warranted to investigate the relationship between mdNLR outcomes in specific pediatric medulloblastoma molecular subgroups.

Biological Sciences

19. **Characterization of Macrophomina Phaseolina Infecting Chia Plants**

Presenter(s): Cailyn Sakurai

Advisor(s): Dr. Hagop Atamian

Microbial organisms cause detrimental effects to agricultural plants by significantly decreasing their plant growth, yield and nutritional qualities, leading to high levels of economic losses in society. Salvia Hispanica L., commonly known as chia, is becoming a rising agricultural crop because of its favorable nutritional qualities. Chia seeds have a high concentration of α-linolenic acid, commonly known as omega-3 fatty acids, which provide several health benefits, in addition to being a rich source of protein and fiber. Chia field trial conducted by the Atamian lab during summer 2018 experienced high levels of disease incidence characterized by root rot, plant wilting, and eventual death of three-month old chia plants. The fugus was isolated and identified as Macrophomina phaseolina based on its morphological analysis on potato dextrose agar plates. M. phaseolina is a widespread fungus that causes a high mortality rate in nursery plants as well as in agricultural crops such as soybean, maize, sorghum, and cotton. The fungus damages the root system of the plant host, resulting in the inability of the root to obtain the required nutrients and water for proper growth of the plant. The objective of this project was to use molecular techniques to confirm the accuracy of the morphological analysis and further characterize the fungus at the molecular level. The DNA of M. phaseolina was isolated and specific DNA fragments corresponding to the internal transcribed spacer (ITS) and the small subunit of ribosomal RNA (SSU rRNA) were amplified using PCR. The fragments were cloned in plasmid and sequenced. The generated fungus sequences were then compared to sequences in the NCBI database, and the identity of the fungus infecting the chia plants was determined to be M. phaseolina. Further analysis was done to assess the presence of genetic variability between our strain and those reported to infect other plant species.

20. Ecological Suppression of Learning in a Model Species

Presenter(s): Caitlin Molina, Caitlin Molina, Catherine Domingo

Advisor(s): Dr. William Wright

There is a large body of literature on how cellular changes during learning result in memory. The well-researched model of sensitization in Aplysia californica documents the cellular and subcellular mechanisms that produce this simple form of learning. Missing from this literature, and, indeed, very rare in the overall literature on learning, are processes that suppress memory in living nervous systems. This research seeks to understand age- dependent learning deficits in Aplysia. We hypothesize that adaptive changes to the nervous system in aging animals were occluded by age- related neuropathologies in animals with different levels of senescence. We employed an experimental approach that accelerates reproduction and other age- related behaviors in an effort to induce "early senescence" in a sub- group of animals, while maintaining normal phenotypes in a different sub- group. The most notable expected result from this study is that the experimental group will more reliably shut- down sensitization mechanisms, thereby allowing us to study those mechanisms. This study attempts to experimentally induce early egg- laying in sea hares, and correlate that early egg- laying with a possible reduction in the capacity to show learning.

21. Light Sensitivity in Hagfish - How Photosensitive are Hagfish?

Presenter(s): Dahlya Habashi

Advisor(s): Dr. Douglas Fudge, Dr. Charlene McCord

Hagfishes are marine craniates that burrow into the ocean floor. Hagfish do not have functional eyes and, as such, perceive light through a dermal light sense, photoreceptors under the skin. Though effectively blind, Pacific hagfish (Eptatretus stoutii) react to light by attempting to find dark shelter or swim away, which lead us to hypothesize that they are photosensitive. Therefore, we predicted that hagfish would spent more time inside of darker tubes than lighter ones. We investigated how sensitive Pacific hagfish are to light by covering clear acrylic tubes with tinted films that allow different percentages of light to enter the tubes. An LED light fixed to the top of the tank illuminated the tanks during the trials and a digital video camera allowed us to monitor Pacific hagfish movement and the time spent in each tube over time. The amount of light that passed through each tinted tube was determined using a Hobo light sensor. Our results suggest hagfish are, indeed, photosensitive. In response to bright light, hagfish swam around and entered tinted tubes; when they entered a more transparent tube, they swam through or quickly exited, whereas they were more likely to spend longer amounts of time inside darker tubes. Our results raise interesting questions about the role of photosensitivity in deep sea animals and the biodiversity of photosensitivity within the hagfish lineage.

22. Locomotion of Atlantic Hagfish: Burrowing in Sand

Presenter(s): Luke Arnold

Advisor(s): Dr. Douglas Fudge, Dr. Charlene McCord

Hagfishes are marine organisms known for being the only craniate that lacks a vertebral column. It has been discussed whether the absence of a spine is an evolutionary adaptation or if hagfish diverged prior to the evolution of the spine. Several hagfish species have been observed burrowing in a variety of substrates, including sand, mud, and animal carcasses. The detailed mechanisms of hagfish burrowing have not been widely researched. In this project, we study the behaviors of the Atlantic hagfish (Myxine

glutinosa) burrowing in sand. This was accomplished by placing an Atlantic hagfish in a tank partially filled with sand and artificial sea water (ASW) and filming the tank with a GoPro camera. Videos were used for kinematic analysis to determine the sand burrowing strategies used. It was determined that Atlantic hagfish sand burrowing occurs in two sequential phases: the first phase began with the hagfish entering perpendicular to the substrate, followed by lateral tail beating that decreased in frequency and amplitude 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 small portions at a time over a longer amount 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 elongate body form of hagfishes does not impede, and may even functionally enhance, the burrowing lifestyle of myxinids.

23. Characterizing the Nitrogenase Regulator Nifa by Site-Directed Mutagenesis

Presenter(s): Justyn Golobic, Hiba Zaidi, Sarah Amaya, Ashna Shah,

Advisor(s): Dr. Cedric Owens

Nitrogenase is an enzyme that converts atmospheric nitrogen gas into fixed nitrogen. It requires a great deal of ATP and reducing equivalents. Due to this requirement, the enzyme is highly regulated. NifA is a transcriptional activator protein that contains a DNA binding, AAA+ RNA polymerase binding, and a regulatory domain, which senses ammonia. It also possesses seven cysteines, primarily in the AAA+ and linker between AAA+ and DNA binding domains. These cysteine residues are hypothesized to be responsible for binding an iron sulfur cluster, which is potentially involved in redox sensing by NifA when levels are reducing. The goal of this proposal is to determine which cysteines are required to form the metal cluster. By mutating each of the seven cysteines and changing them to a non-binding alanine or serine, we expect to see decreased binding of the iron sulfur cluster. By using site-directed mutagenesis, 3 mutants were successful created These mutants are C438S, and C426S in the full length NifA. We also made C463S, in a truncated NifA construct where nitrogen sensing N-terminal domain was removed. We plan to express these constructs in E. coli and supplement the cultures with iron. This experiment will determine how much iron sulfur cluster is present in wild-type NifA compared to the variants with a mutated cysteine. In samples containing the cluster, a brown color will be observed and the purified protein will have spectroscopic characteristics of an iron-sulfur protein, whereas a clear solution is indicative of less or no iron. Such a result would indicate that the mutated cysteine is responsible for cluster binding.

24. Developing a Disease Assay Protocol for Identifying Chia Varieties Resistant to Macrophomina Phaseolina

Presenter(s): Reis Misaka, Julien Besnard

Advisor(s): Dr. Hagop Atamian

Chia (Salvia Hispanica) cross breeds were planted in the summer of 2018 at the Irvine Ranch Conservatory with the intent of selective breeding for agriculturally beneficial traits. Preexisting pathogens in the soil caused 40-50% fatality of adult plants. The primary pathogen responsible was identified as Macrophomina

phaseolina (commonly known as charcoal rot); a widespread soilborne pathogen which infects large number of plant species including economically important plants like soybean, corn, sorghum, alfalfa and sunflower. The fungus infects plant roots early in the spring when soil moisture is high. The infection slowly progresses resulting in reduced root mass which decreases the plant's drought tolerance. As a result, due to drought conditions at the end of summer, adult plants wilt and die prematurely. In this project we developed a disease assay protocol to study the disease progression and the mechanisms by which this fungus infects chia variety Pinta. M. phaesolina on wheat seed vector where used as source of inoculum to evaluate disease progression and symptoms in chia seedlings. Sampling root and stem fractions identified the progression of the fungus from root to stem. In an attempt to identify sources of resistance genes to this devastating plant pathogen, disease severity was assayed in another chia variety called Tropical, which is adapted to grow in humid conditions. Identifying disease resistance genes in plants allows for breeding of resistant cultivars, improving the marketability of chia.

Chemistry

25. Ruthenium-Gold Bimetallic Nanoparticles: Synthesis and use in Catalysis

Presenter(s): Bryn Merrill, Amy Lam
Advisor(s): Dr. Jerry LaRue

Catalysis provides pathways for efficient and selective chemical reactions through the lowering of energy barriers for desired products. Gold nanoparticles (AuNP) show excellent promise as plasmonic catalysts. Plasmon resonances are oscillations of the nanoparticle electrons that generate energetically intense electric fields and rapidly decay into energetically excited electrons. The excited electrons have the potential to destabilize strongly bound oxygen atoms through the occupation of accessible anti-bonding orbitals. Tuning the anti-bonding orbitals to make them accessible for occupancy will be achieved by coating the AuNP in a thin layer of another transition metal, such as ruthenium, silver, or platinum, creating a bimetallic nanoparticle. The excited electrons from the AuNPs can transfer to the oxygen-ruthenium anti-bonding orbital. Electrons occupying the anti-bonding orbital, weakening the bond between the atomic oxygen and the bimetallic nanoparticle and making the atomic oxygen much more reactive. We will be studying the efficiency of bimetallic nanoparticle catalysis on chemical reactions where strongly bound atomic oxygen species limit reactivity, such as carbon monoxide (CO) oxidation, and optimizing the AuNP to perform faster reactions.

26. Photochemical Production of Hydrogen Peroxide in Seawater

Presenter(s): Evan Sue, Daniel Chang
Advisor(s): Dr. Warren De Bruyn

Hydrogen peroxide (H2O2) is an important intermediate in aquatic redox processes that affect water quality. H2O2 has been shown to reduce fecal indicator bacteria (FIB) levels in wastewater treatment and might be the source of observed diel variability in FIB levels in marine bathing waters. The primary source of H2O2 in seawater is the photochemical production of H2O2 from chromophoric dissolved organic material (CDOM), however, diel cycles in H2O2 concentrations measured in the surf zone at Crystal Cove State Beach show there might be a non-CDOM pathway to peroxide production. The goal of this project

is to determine if photochemical production from iron in beach sand could be a source of peroxide in surf zone waters. Seawater samples with and without sand were irradiated using a 300 watt Xenon lamp. Concentrations of H2O2 in the sample were measured by fluorescence as a function of time to determine the possible influence of iron in the sand.

27. **Python Implementation of the Hartree-Fock Method for Pedagogical & Research Purposes**

Presenter(s): Gary Zeri
Advisor(s): Dr. Jerry LaRue

Often during the process of innovation and scientific advancement, experimentation is the key to increasing the current knowledge of body. Unfortunately, experimentation can often require extended periods of time as well as monetary resources to perform. The use of computational chemistry can increase the rate of scientific advancement by simulating experimental results, allowing researchers to focus on experiments whose computational counterparts have shown the greatest promise. Students new to the sciences are often not exposed to these methods due to their complexities. The purpose of this project is to implement the Hartree-Fock method, one type of computational chemistry method, whose programming design will serve to act as a pedagogical tool as well as being used for research purposes. The Hartree-Fock method was implemented within the Python computer language, using the Jupyter Notebook framework. Python is often used in for scientific computing purposes as well as being much simpler to understand in comparison to Java and C++, making it ideal for pedagogical purposes. The use of Jupyter Notebook allows the code to be broken up into separate sections with text headings that provide a description of the theory behind the implementation, as well as referencing material in "Introduction to Advanced Electronic Structure Theory," by Attila Szabo and Neil S. Ostlund, if students wish to pursue an in-depth discussion of the code's theory. The project will be expanded in the future to include Density Functional Theory(DFT), a method that uses Hartree-Fock as a foundation and provides more accurate and powerful simulation capabilities designed for research driven applications as opposed to pedagogical use.

28. **Molecular Machines: Synthesis, Modeling, and Applications**

Presenter(s): Syd Kotar
Advisor(s): Dr. Jerry LaRue

While some of the smallest, most useful machines known to science are the biological molecules that keep living organisms alive, there is a growing advancement of the creation of artificial molecules that have the same function and are more efficient. Molecular machines were invented in 1983 when scientists in France created a machine formed of two interlinked molecular rings. In 2016, the Nobel prize in chemistry was awarded to Feringa, Stoddart, and Sauvage who finally documented molecular machines and put them into energy-filled states in which their movements could be controlled. From this, molecular machines became known as a group of molecular components that produce quasi-mechanical movements when exposed to specific stimuli. Thus, from this invention came progress through which more advanced molecular machines were created such as those with the ability to act as a motor, propeller, or switch. The implication of these discoveries sets the stage for applications in both microchips and the human

body. Molecular machines have various general applications in chemistry, and more specifically, applications such as the realization of directed motions, which can be applied within the protein kinesin, synthetic polyelectrolytes by utilization of rotaxane, and catalysts.

29. **Preparation and Characterization of Ruthenium-Gold Raman-Active Catalytic Surfaces**
    Presenter(s): Thang Nguyen
    Advisor(s): Dr. Jerry LaRue, Molla Islam

Heterogeneous reactions at the gas-solid interface play a major role in many important industrial and environmental processes. These reactions typically rely on metal surfaces, to act as a catalyst between gas phase reactants and products. The catalysts lower the transition state barrier in the formation of the products. The mechanisms of reactions on catalysts is often not fully known due to the difficulty of observing the bond breakage and formation between gaseous molecules at the interface. One method in which the catalytic mechanism can be studied is by using Raman Spectroscopy. However, one drawback of this method is the fact that Raman Spectroscopy relies on Raman scattering effect, which needs to be enhanced using a specialized surface called Raman-active surface. This study aims to address those challenges by creating surfaces that are both catalytically active and Raman enhancing, specifically from raw polycrystalline gold foil and ruthenium. The gold sample will undergo three main preparation steps: 1) smoothening for uniformity, 2) microscopic roughening for Raman enhancing structure, and 3) deposition of ruthenium for catalytic activity. The roughness of the surface are visualized using Atomic Force Microscopy (AFM) and Scanning Electron Microscopy (SEM), and electrochemically analyzed throughout each step utilizing the electrochemical cells. Ultimately, the sample is investigated using Raman Spectroscopy in oxidation reaction of CO. This study hopes to comprise a comprehensive and efficient procedure for creating more Raman-active surfaces from widely available raw materials.

Communication Studies

30. **The 7 Best Social and Organizational Practices of Successful Science Gateways and Cyberinfrastructure Projects**
    Presenter(s): Bethanie Le, Faith Escalera
    Advisor(s): Dr. Kerk Kee

Cyberinfrastructure (CI), also referred to as e-science, is a dynamic system that consists of advanced computing systems, data storage systems, software, and most importantly, people (Stewart, 2008). Among these interdependent technologies are unique computational tools that are designed and developed to harness big datasets for insights. This includes science gateways that reduce the need for highly specialized skills and programming knowledge in the CI community. In order for science gateways and CI projects to have the greatest impact on grand challenges, they need to be widely adopted and diffused by the global scientific community. However, creating and maintaining these platforms require effective organizations that increase their teams' abilities to optimize their potential to produce innovative work. The majority of diffusion research focuses on the innovation, but not on the operations of the organizations behind it. This poster reports on the 7 best social and organizational practices of successful science gateways and CI projects. The findings emerged from qualitative research of 20

interviews with administrators, technologists, scientists, developers, users, facilitators, liaisons, and educators across the United States. The social and organizational practices that resulted include: raising awareness, establishing trust among teams and with potential adopters, networking with the CI community, keeping a track record of reliability, having the freedom to explore, staying on top of the trends, and encouraging diversity in team composition. We discuss that these findings can serve as a guideline for CI teams to organize their projects and to generate strategies that will increase the likelihood of the adoption and diffusion of their e-science projects.

31. **Learning, Cultural Intelligence and Intercultural Competence**

Presenter(s): Christian Abrahamson, Ayse Nazli Donmez, Josanni Martinez
Advisor(s): Dr. Austin Lee

How does exposure to different cultures affect one's cultural intelligence and intercultural competence? Perhaps the first step into understanding this question is to first look at the importance that these two terms play in our rapidly growing and global interconnected world. According to Held and McGrew, In order to restrain destructive agendas fueled by geopolitics, violence and imperialism and to manage and eliminate the culture of fear incited and exaggerated by such motives, the enhancement of cultural intelligence and intercultural competence is crucial both on an individual and collective level (Held & McGrew, 2002; Massey, 2008). This current study examines the effects that exposure to different cultures has on cultural intelligence and intercultural competence; with an emphasis on the effect that different types of learning (direct vs. indirect) has on the level of one's cultural intelligence and intercultural competence. An individual's ability to navigate in a multicultural setting and his/her willingness to be a part of this setting is correlated with previous exposure to diversified cultural products and settings. One's cultural intelligence and intercultural competence are critical factors that play a pivotal role in the understanding of one's place and relationships in the multicultural environment in this age of global interconnectedness. Based on the literature, it is hypothesized that both direct (ex: study abroad, travel) and indirect (in-class learning) exposure to different cultures will enhance one's capability to (a) relate and work effectively in culturally diverse situations, (b) develop tailored cognition, skills, and attitudes that promote verbal and nonverbal communication that is efficient and suitable in intercultural interactions and (c) increase one's ethnocultural empathy through reducing anxiety around fear-based social issues such as racism, discrimination and xenophobia fueled by the negative effects of globalization and promoting more informed, rational and empathetic methods of sensemaking. Williams, T. R. (2005).

32. **People, Politics, and Parasocial Relationships**

Presenter(s): Natalie Benson, Bryan Macias, Jon Small, David Wyman
Advisor(s): Dr. Riva Tukachinsky

This study examines the effects of political statements made by celebrities through social media on media consumers. We hypothesized that consumers will improve their relationship with the celebrity and support the celebrity in upcoming projects if the tweets are consistent with their beliefs. However, if the tweets are inconsistent with their beliefs, media users will preserve their relationship with the celebrity by attributing lesser importance to the political tweet. Participants were recruited from the School of Communication subject pool to test the hypotheses. By creating fabricated tweets, ostensibly made by

actor Matt Leblanc, participants read, at random, left-leaning or right-leaning tweets. A control group was shown Leblanc's home page and did not read any tweets. The three tweets made political statements about immigration at the U.S. Southern Border.

33. The Effects of the Source of Celebrity Information on Parasocial Relationships

Presenter(s): Noelle Roys, Monique Newman, Marek Spooner-LeDuff

Advisor(s): Dr. Riva Tukachinsky

The purpose of the study is to examine how the source of information about celebrities affects media users' feelings toward them. Specifically, we will focus on two ways in which people relate to media figures. Parasocial relationships (PSR) are one-sided relationships that people form with media figures. The concept of parasocial interaction (PSI) is closely related in that it entails one-sided involvement with a media figure, but the experience is restricted to the duration a person is viewing the figure. Due to the nature of social media and to celebrities' increasing use of social media platforms, existing research implies that social media is an ideal medium to create and foster both PSRs and PSIs. We hypothesize that viewing content posted by celebrities on their personal social media accounts will create stronger PSRs and PSIs than when viewing content about celebrities on the social media accounts of tabloid publications. Participants will be exposed to stimuli (e.g. a tabloid celebrity Instagram account versus a celebrity's personal verified Instagram account) and an online questionnaire to measure the strength of viewers' PSRs and PSIs.

34. Character- Actor Consistency

Presenter(s): Shelby Brown, Galen Patterson, Lisa Salvatore, Rivka Saydman

Advisor(s): Dr. Riva Tukachinsky

The present study examines viewers who are exposed to an actor that is playing a character that is consistent with his previous roles and an actor that is playing a character that is inconsistent with his previous roles. We will then determine whether they experience a higher expected enjoyment and a higher parasocial relationship when exposing them to two different magazine ads for the two different movies with the same actor. The participants were split into two groups and were exposed to the same celebrity. The first group was exposed to the actor playing in a role that is consistent with his previous roles and the second group was exposed to the same actor playing in an inconsistent role. The study was conducted to determine how parasocial relationships will play a role in the expected enjoyment of a film depending on role consistency or inconsistency. We expect that exposure to an actor playing a role consistent to his previous roles will lead to a higher enjoyment level and higher parasocial relationship opposed to an actor playing a role that is inconsistent with his previous roles.

35. Characteristics and Concerns of Parents' Perceived Effects of Media

Presenter(s): Rochelle Salvador, Ryan Johnson, Andrea Chirino, Amanda Olsen, Megan Norris, Josanni Martinez, Jon Small

Advisor(s): Dr. Riva Tukachinsky

Media use is pervasive in modern life and has distinctive effects on children. Children are considered a vulnerable population because they are still in early stages of cognitive development, and have limited

comprehension of media effects. Media researchers have discovered specific risks and consequences of media exposure, but it is unclear how aware parents are of these effects and what strategies they can employ to mitigate the negative effects. This research study will explore parental concerns about their children's media consumption, their knowledge of media effects, and their levels of media literacy. Participants will be recruited using snowball sampling Amazon Mechanical Turk. It is predicted that correlations between perceived media effects, literacy, and parental concern will be tested. The study will also investigates which characteristics will contribute to differences in monitoring behaviors based on demographic characteristics will be analyzed. The results from these research questions and hypotheses will inform the development of media literacy presentations and resource materials for parents.

Computational Science

36. Deep Learning in Predicting Impending Movement

Presenter(s): Andy Liang, Elnaz Lashgari
Advisor(s): Dr. Uri Maoz

This study is an investigation of deep learning (DL) methods in predicting self-initiated movements using the time course of neural activity. Previous research looked at only the neural activity toward upcoming movement. In contrast, Basbug et al. (under review) designed a new experimental paradigm, where data was collected in a controlled setting, with each trail terminated by either a self-initiated movement or a randomized timing devoid of movement. Magneto- and electro-encephalography (MEG and EEG, respectively) data was collected from human subjects and organized into movement and non-movement epochs. An AdaBoost model was trained to classify M/EEG data into movement and non-movement trials with a sliding window. The AdaBoost model showed that the classification accuracy increases as the sliding window getting close to the movement onset time. However, the study did not expand its effort to comparing different classification methods, which might yield a different result. DL has proven powerful in many classification tasks. Different DL architectures—from convolutional neural network (CNN) to recurrent neural network (RNN)—will be tested and compared while having the AdaBoost model as a benchmark. DL methods are well-known to require a lot of data. Various data augmentation techniques for M/EEG data will therefore also be investigated to increase the size of the available data. We expect to find improvement in prediction accuracy and design a standard framework for M/EEG data augmentation in DL tasks.

37. Communication Platform for the Deafblind

Presenter(s): Abigail Tan, Grayson Berman, Antoine Canaan, Kolby Ramirez, Carlos Amezquita
Advisor(s): Dr. LouAnne Boyd

The focus of this research is to define and expand on Computer Supported Cooperative Work (CSCW). CSCW examines how computers affect cooperative work. CSCW focuses on ten dimensions that describe group work including time, space, group size, interaction style, context, infrastructure, collaborative mobility, privacy, participation, and extensibility. These dimensions are useful for understanding group work mechanics. When designing technology to support cooperative work, there are five elements the CSCW field focuses on: communication, configuration, coordination, information access, and interaction.

Our research revolved around a contextual inquiry. We went into the Information Systems and Technology (IS&T) office on campus and observed their work, taking notes through the lens of the ten CSCW dimensions. Our goal was to design an accessible communication platform to allow for a more welcoming work environment for their deafblind programmer analyst. We created a prototype based on some of the ten dimensions that their workspace has room to improve on: interaction style and collaborative mobility. Our prototype is an office wide chat messaging system that can read the chat transcript to a braille keyboard. We anticipate positive feedback for both disabled and non-disabled employees.

38. Assistive Technology for the Blind and Deaf

Presenter(s): John Hunter, Donner Hanson, David Hernandez, Austin Hong, Marek Spooner-LeDuff

Advisor(s): Dr. LouAnne Boyd

Our presentation will introduce CSCW research and methods, as well as a design proposition for a device to assist communication with blind-deaf individuals. After our field research at the Chapman IS&T office's we discovered one of the employees suffers from being blind and deaf, and was in need of new technologies to help him the workplace. This individual completes his tasks through a text to braille keyboard. While this has made his work possible, he could use extra resources to help him in certain situations and emergencies. In this presentation we will discuss an alternative method to assist him in these situations. We have devised a technology that will aid him in these scenarios. A braille pager that is adhered to his desk could help notify him of a number of conditions. There would be a control panel on the entrance to his cubicle with certain letters for another person to use that will give him notifying vibration and a one character page, on the device, that informs him of the conditions around him.

39. Experiment Finder App

Presenter(s): Akima Connelly, Alex Vajiac

Advisor(s): Dr. LouAnne Boyd

We have developed an app where students can sign up for experiments run by professors, and where professors can reach out to students and easily find experiment participants. By using a variety of low-fidelity prototyping methods, we have explored how users can potentially interact with the app, however there needs to be more data and opinions on how easily and effectively users can navigate through our app. We have created a wireframe to simulate how the user interacts with the app to make sure that it is easy to navigate through and use. That is why we are going to test how long it takes for users to navigate through this app, and survey how comfortable they feel using the app. We will time the user as they perform a specific task that will require them to navigate through the app. After they finish the task we will survey the individual users on how easy and clear it was for them to complete the task on a 1-5 scale. Based on our data and comments, we will find possible ways to make our app easier to navigate.

40. mUSic

Presenter(s): Alex Rigl, Matthew Parnham, Rielle Dizon

Advisor(s): Dr. Michael Fahy

Research on online media platforms is largely focused on improving usability and functionality of the application, often overlooking current wants and needs of platform-owners. Developed in 2006, Spotify provided a solution to the growing piracy the music industry was facing. Today, Spotify is considered to be the World's Most Popular Streaming App. Spotify is revered for their Discover Weekly playlist, a user-targeted suggested list of songs based on the user's current listening habits. This feature alone has allowed the music industry to flourish more than ever as it continues to introduce users to many new artists and genres. However, despite this feature, there are still users who are very particular about their music. A problem often faced by groups of people is choosing what music to listen to while together. The goal of this project is to develop an application that generates playlists that share commonalities with the music tastes of two different users. Using the Spotify API to access user listening habits, specifically a user's top artists and tracks, the application will create a list of songs that finds a medium between the two users, and export that as a playlist to each user's Spotify account. This will hopefully help alleviate the issue of "who controls the aux cord" and ultimately continue to introduce users to new music.

41. Study Connection

Presenter(s): Ananya Vittal, Lisa Dong, Allison Thompson

Advisor(s): Dr. LouAnne Boyd

For our Human Computer Interaction class, the objective was to create the user interface for an app whose goal is to facilitate social connectedness among university students. The purpose our project is to develop an app where students in the same class are able to connect with each other in a variety of beneficial ways to promote a community that helps and learns from each other.. As students at Chapman University, we have noticed that the majority of students do not interact much with each other during class hours. This is only a disadvantage to them if they have difficulty doing class assignments or want to form study groups with others in their class. Studies have shown that students are more successful when they communicate with peers about course material or teach concepts to others. In addition, this app can be utilized by the professor so that students can have an extra network to draw help or study resources from. Users will be able to play study games, schedule and plan study group meetups, ask questions and receive feedback in the forum, and ask each other quick questions using the instant messaging portion of the app. In order to make the app more accessible, some aspects of the user interface and user experience will be multi-modal. In order to apply HCI concepts, we did a variety of exercises to create our final prototype. For example, we pitched the app idea to users and looked at possible positive and negative scenarios. We also did card based prototyping and paper prototyping, which are low fidelity prototyping methods. In order to visualize the app, we worked on making a wireframe to demonstrate our horizontal and vertical prototypes. These methods made our creation and design process fluid and easily adaptable.

42. Guess the Artist: A Multiplayer Client Server Game That Uses Multicasting

Presenter(s): Emily Chan, Kaitlyn Abdo, Kiara Cardona, Jin Jung, Mark Schneider

Advisor(s): Dr. Michael Fahy

The internet and its underlying infrastructure continue to become increasingly complex, and it is our responsibility to become proficient with the current architecture and efficiently utilize resources. Our aim is to attain a better understanding of network communication processes by creating a multicasting program that accesses the Spotify API. We know that developers are capable of accessing these internet services and their data. Our goal is to take these resources and use them to create a multi-threaded chatroom game that will work as follows: as clients join the chat server, they can opt into the game by entering a keyword. Once in the game, the clients will take turns secretly selecting an artist. The artist's name will be used to retrieve a song belonging to that artist and play it. The remaining clients will not know who the artist is and will only have the music that plays and the genre. We will use the Twitter API to calculate the sentiment analysis on the artist name, which will be used to determine the players' scores depending on the range of the sentiment score associated with the artist. The game will end/reset when a player accrues 10 points.

43. Smart Mirror

Presenter(s): Grant Stankaitis, Bobby Kain, Alex Alvertos, Dylan Dewolfe, Evan Shields

Advisor(s): Dr. Michael Fahy

A smart mirror or "Magic Mirror" is a personal assistant/smart home device within the common form factor of a mirror. We will implement a smart mirror in a minimal, aesthetically pleasing way. The mirror will bring greater functionality to a home than a smart speaker alone as it will have a visual display with multiple visual modules and will be easy to read. The smart mirror will be implemented with a two-way mirror, monitor, and a Raspberry Pi. The mirror will have various modules built in, such as time, weather, news, and Spotify or Google Assistant. These modules will display relevant information to the user, such as the weather forecast and currently playing tracks. Creation of the smart mirror involves both hardware and software challenges. Engineering skills are required to build the mirror frame and attach the monitor to the frame, especially when the goal is to make the frame as slim as possible. The software components require implementing multiple internet APIs. The result will be an attractive and useful addition to any home.

44. SongMatch

Presenter(s): James Kistner, Ryan Kassab, Charles Story, Chase Tullar, Eric Lim

Advisor(s): Dr. Michael Fahy

Our project, SongMatch, aims to simplify the way users search songs on different streaming services, such as Spotify, Apple Music, and Soundcloud, by utilizing a simple GUI to display similarities, or the lack thereof, when searching for a song. This application contributes to the areas of our interest well because it incorporates the concept of taking more than one API of several popular music streaming platforms and combines it into one improved client and result. SongMatch is an attractive concept due to the fact that some songs are hosted on only certain music services, while others are available on all, and users have to find out if the songs are on their music streaming service by themselves. SongMatch will include a list of a song and remixes available on each streaming service to provide accessibility and ease to the user.

45. Student Alumni Job Network

Presenter(s): John Park, Dylan Dewolfe, Yiftach Nachman, Jerrick Torres

Advisor(s): Dr. LouAnne Boyd

The purpose of our project is to create a phone application that helps Chapman students connect with Chapman Alumni. The expectations of these connections are to help students find connections and future jobs related to their field of study. Using user centered design principles, we are designing an application to connect upper-class chapman students to recent Chapman graduates who currently hold professions of interest to students. Prioritizing human computer interaction we have created and conducted multiple types of prototype testing to make the app as user friendly as possible. The purpose of the application is to help students who worry about employment after they get their degree. The main functions will allow current students to chat with Alumni that work in the fields they are interested in. Giving students the ability to ask questions about their day to day operations, interview questions, and a general sense of what working the company in question is like. For those who successfully match with alumni(s), we expect them to communicate with their mentors for potential job/internship opportunities. This event will measure our success metric and show us that our app is successful. Upon completion, we expect to have a greater than surface level understanding of mobile development and user-centered design.

46. Finding Similar Artists: Utilizing Spotify API to Enhance User Experiences by Suggesting Artists that User Might Like

Presenter(s): Johnny Chapman, Ali Ahmadnejad, Yixing Zheng

Advisor(s): Dr. Michael Fahy

Our program utilizes Spotify's API by providing users with a clean interface where individuals can create and listen to playlists that are made up of the top related artists from artist that they had originally searched for. The purpose of this program is to provide our users with a platform where they can discover songs that sound similar to a given artist. The similarity is based on analysis of the Spotify community's listening history. By proving new artists to the user that they could potentially like, they will have a high likelihood of extending the time that they spend on the application, which provides more opportunities to the application developer. Upon Startup, the program will prompt a user for the name of the artist that they would like to base their new playlist on. In addition to this, the user will also have the option to search for related songs to multiple artists as well as have full control over the size of the playlist that will be generated. The program will then take the Spotify ID that is given to that artist as the path parameter and find the most related artists. It will then create a playlist of the most related songs of the same genre.

47. "Greekly" – A Calendar for Greek Life

Presenter(s): Neetu Patel, Samir Kamnani, Brady Hoskins

Advisor(s): Dr. LouAnne Boyd

In our Human and Computer Interaction class at Chapman University, we were tasked to create an application that promotes social connectedness within the campus community. With all three members in our group being involved in Greek Life, we identified a problem space of the community being over programmed due to a lack of communication. In order to solve this, we aimed to make an application to culminate information about the various Greek events into one easily accessible calendar application. This

application expands beyond just a basic calendar, by also allowing organizations to add ticket purchases to events, event details, and RSVP information. We hope our application will better inform the community and ultimately boost attendance and social connectedness at these events.

48. CleanMessage

Presenter(s): Nick Lai, Charlie Liu

Advisor(s): Dr. LouAnne Boyd

Human Computer Interaction (HCI) aims to see how humans and computers interact, and to do so we develop apps with the end user in mind. For our class, we decided to begin development on a social connectedness app, by studying how humans interact with computers through end user tests. Our app, CleanMessage, aims to connect users in a efficient and elegant manner. CleanMessage is a new messaging service that we are developing for web and mobile. We expect to provide multiple unique features, such as a scheduled mute functionality for individual chats, calendar planning functionality, and allowing multiple input options for accessibility. End results will be presented with our poster.

49. ChapMap: A11Y App

Presenter(s): Nicole Chu, Kiara Cardona, Kaitlyn Abdo, Brandon Fabre

Advisor(s): Dr. LouAnne Boyd

As part of the curriculum for the Human Computer Interaction course, we were asked to design and build an application that promotes social connectedness at Chapman University. Our team decided to build an interactive accessibility map, ChapMap. ChapMap aims to allow students with disabilities to navigate to different accessibility amenities on campus including elevators, ramps, bathrooms, doors, etc. In the application, students would be able to rate the how accessible an amenity is, report any damages or issues with an amenity, and communicate with other users on a public forum. We chose to create this application because of our passion for inclusivity for all Chapman students. To build ChapMap, our team has received user feedback, designed low-level and high-level prototypes, and user tested. This was done throughout the semester in class, using Chapman students as our end users. Our results will be presented in our poster.

50. Shopify-ing the Consumer World

Presenter(s): Ryan Klapper, Ashley Wood, Cole Gotelli, Zach Jagoda

Advisor(s): Dr. Michael Fahy

Online shopping has become an absolute nightmare for the average consumer who wishes to purchase an item that is highly sought after. Our project combats the already intense bot-marketplace. We are creating a cloud-based shopify bot that has the capability to purchase an item at a blazing fast speed. We chose shopify as the main base of this project is due to the growing community of shopify websites that are now taking over the e-commerce space. We want this bot to be universal across many different websites, not just one in particular. The user enters the url of the website, chooses specific keywords (this is how the bot finds the item), and makes a profile. This profile contains the user's information that is required for purchasing an item. The bot also has connections to discord and slack, meaning anytime there is a purchase or decline on your credit card, you will receive a discord or slack notification. This is done via discord or slack webhooks. By having the bot cloud-based, it optimizes speed tremendously.

51. How the Emotiboard Will Promote a Social Work Environment for Blind-Deaf Users

Presenter(s): Samantha Gonzalez, Ashley Wood, Zach Jagoda, Ryan Klapper, Joey Sheridan
Advisor(s): Dr. LouAnne Boyd

Computer Supported Cooperative Work, or CSCW is the field of study dedicated to how groups interact with computers utilizing user studies. This field has been evolving for decades as researchers work to build systems with insight on technology and people to better establish communication and interaction and therefore produce better work environment. This paper investigates the social impact of an assistive device that will allow emotional expression in the text files of a blind user. The board would include keys labeled by emotion that when pressed will apply diction pertaining to that emotion through the text to reflect on the respective emotion key. Using contextual inquiry to observe the social degree among employees, we examined how a given office environment interacted with one another in a technology heavy supported space. After discussing the data, we suggest ways to best implement the "Emotiboard" through Wizard of Oz prototyping to simulate the potential use of our device. We argue in this paper that such a keyboard will provide the opportunity to have social interaction between the blind-deaf user and their peers in a collaborative work environment through bridging the social-technical gap in giving the user a form of personal expression in text.

52. How the Chapman Update App Will Assist in Time Management and Socializing Across Chapman Community

Presenter(s): Samantha Gonzalez, Ashley Wood, Zach Jagoda, Ryan Klapper, Alberto Garibay
Advisor(s): Dr. LouAnne Boyd

Human Computer Interaction, or HCI is the field of study dedicated to how humans interact with computers utilizing user study. HCI's core research relies on the basis of the user, the computer, and how they work together through the user's interface. The purpose of this project is to create an application in which we provide details regarding campus services with inclusive design for users input so to promote social interaction across student population. As the Chapman community has become increasingly reliant on technology, having information at the click of a button is becoming an integral part of a student's day-to-day. With this, time management has also become all the more critical for student's to allow for a balanced lifestyle between school and social interaction. Our app hopes to be a go-to tool for the Chapman student body to best plan their day with the ease of an app where all information is made available to them at all times. Much like the Disneyland app, the Chapman Update App will provide a map of campus with icons pinned to locations where services for students to reference for information pertaining to each service. Such services will include dining options, parking availability, campus resources such as the health office and public safety, gym information, as well as an aspect to connect with your friends who are on campus. Using low-fidelity prototyping, we aim to collect data on the affordances of the app and ultimately provide an ease to their user experience.

53. MusicLink

Presenter(s): Suleiman Karkoutli, Cristiano Firmani, Nikolai Simonov, John Hunter, Omar Arafeh
Advisor(s): Dr. LouAnne Boyd

Our research project for human computer interaction involves creating a method to improve social connectedness among aspiring musicians. In our HCI class, we focus on the methodology and psychology behind why humans use certain features of computer applications. We will apply these methods to our own app through prototyping and user testing. We are motivated to lead people with the shared passion of music together to help them create something that bonds the creativity of two or more individuals. We hope to create an app that is easily understandable and allows users to quickly find the type of artist they are searching for, and connects them, allowing them to begin creating ASAP. Musicians often go through the struggle of not being able to meet enough people to work with. Additionally, musicians will often need help with their music in terms of instruments, vocals, and other aspects of creating a song. Our app will facilitate this process and encourage students to reach out and build a network. Users can request collaborations from each other and be able to specify what it is that they are looking for. Overall, the app strives to promote social connectedness amongst Chapman students through music creation.

54. CSCW IS&T Study

Presenter(s): Suleiman Karkoutli, Alexander Muse, Kathleen Gendotti, Karl Hickel, Omar Arafeh Arafeh, Ananya Vittal
Advisor(s): Dr. LouAnne Boyd

Computer Supported Cooperative Work (CSCW) aims to create technologies that help support people in their work. The purpose of this project is to describe the contextual inquiry process that took place on March 6th, 2019. As a class, we were able to observe several employees at the office of Information Systems and Technology (IS&T) department and report our observational findings on a class Google document. This experience gave us insight into the work processes of the department as well as the interaction style and coordination among the employees. In order to improve accessibility in the workplace, our group created an idea for a Wizard of Oz prototype that could benefit an employee with deaf-blindness. Our prototype, which is a speech-to-braille converter ideally built from a raspberry pi, would have the power to foster communication and ameliorate an employee's social connectedness within the office. In the event of an emergency, it would also serve as an efficient communication system for employees with deaf-blindness.

55. Haptic Feedback: An Device To Help The Deaf-Blind Communicate In The Workplace

Presenter(s): Zach Granoff, Corey McCrea, Chase Toyofuku-Souza, Brady Hoskins, Nathaniel Elder
Advisor(s): Dr. LouAnne Boyd

The study of computer supported collaboration is a rapidly developing field as technology becomes further integrated into daily life. This also leads to the development of more integrated assistive technologies to incorporate more inclusivity for individuals in the workplace. This project focuses on a contextual inquiry on an information technology department to further understand dimensions of CSCW design space as it relates to them. The results of the contextual inquiry provided the basis for developing

a machine to assist a deaf-blind individual with collaborating with others in his organization. We propose a mechanical hand and camera system to enable simultaneous two-way communication, ideally to replace a braille keyboard, which is slower and more taxing on the user. This device could be used in multiple settings such as the workspace, meetings and social visits to promote interaction and improve on making communication more synchronous in the hopes of having deaf-blind workers perform tasks that involve teamwork and collaboration.

Economics

56. The Recovery Process of Foreign Banking Crises

Presenter(s): Valeria Park
Advisor(s): Dr. Steven Gjerstad

In today's economy, big banks, such as Goldman Sachs, Citigroup, and Bank of America, are considered vital to maintaining the stability of the economy. These types of firms are known as systematically important financial institutions (SIFI) that U.S. federal regulators determine would pose a critical threat to the economy in the case of its failure. Due to the critical role of these institutions, they bear stricter regulatory burdens. As evident from the 2008 financial crisis, SIFI have the ability to devastate our economy; therefore, in order to prevent these financial institutions from avoiding the responsibilities of their liabilities and management structure, Dr. Steven Gjerstad's research proposes a reorganization bond structure. Along with his research, I compared nine different countries all affected by banking crises to analyze the various approaches, resolutions, and recovery times. For the East Asian Financial Crisis in 1997, I researched Thailand, South Korea, Indonesia, and Japan. For the Global Financial Crisis in 2008, I researched the United States, Lithuania, Estonia, Greece, and Ireland. Through my research, I found three key similarities: possession of bad assets, ad hoc responses, and bank bailouts. In addition to the three similarities, I discovered that all nine countries differed in recovery times. When observing the Gross Domestic Product (GDP), the peak, trough, and recovery times of each country are very distinct. Whether certain resolution regimes are responsible for faster recovery times remains to be determined through further research.

English

57. Women Come, Too: Female Agency in Feminist Pornography

Presenter(s): Chye Shoong Chin
Advisor(s): Dr. Ian Barnard

Pornography has been historically notorious as a source of misogynistic rhetoric, toxic masculinity, and an advocate for rape culture. Although there are definite problems within the adult entertainment industry, feminist ideology has created a subgenre of feminist porn. This project investigates the question: How is female agency represented in feminist pornography? The rhetorical foundation of this investigation is composed of essays written by cultural critics, sex workers, and porn producers in the anthology The Feminist Porn Book, which gives insight on the philosophy and ethos behind the concept of feminist pornography. Rhetorical theories are also drawn from the chapter, "The Popularity of Pornography", from

the book, "No Respect: Intellectuals and Popular Culture", written by sociologist Andrew Ross. I use these rhetorical theories to analyze two feminist porn films, one from the 1990s and one from 2015. I discuss the conclusions I come to about the possibilities of feminist pornography in the context of these texts and the results of my research with a small focus group of feminist women who watched and evaluated the films' feminist practices.

Environmental Science and Policy

58. Biodiversity Threats to Southern California Estuaries: Invasive Algerian Sea Lavender in the Upper Newport Bay

Presenter(s): Anna Bergland, Anna Bergland, Michaela Montgomery
Advisor(s): Dr. Jason Keller

The US Fish and Wildlife Service has provided funds to a non-profit organization in partnership with California Department of Fish and Wildlife to enhance 50 acres of coastal salt marsh habitat by removing or treating occurrences of the non-native, invasive Algerian Sea Lavender (Limonium ramosissimum). Algerian Sea Lavender (ASL) is one of the most problematic, non-native plants to invade coastal salt marshes as it is outcompeting and replacing the native plant cover. The most vulnerable of native marsh dwellers are the Belding's Savanna Sparrow (Passerculus sandwichensis beldingi) and Salt Marsh Bird's Beak (Cordylanthus maritimus maritimus). Protecting and providing available growing space for the Salt Marsh Bird's Beak plants is of particular importance as it is listed as a federal and state endangered species. Removing the invasive species allows the salt marsh to re-establish its native species biodiversity, which is imperative to the ecosystem's function as a nutrient-rich, transitional habitat between the ocean and land. Removal has consisted of a variety of techniques ranging from hand-picking to solarization – the placement of tarps over plant cover that mainly consists of the invasive plants. There has been minimal documentation on areas where ASL has been eradicated using the different removal techniques. In our project, we created GIS maps of the invasive Limonium ramosissimum, beginning in areas where documented removal has occurred and spreading to newly observed locations. The mapping of ASL removal techniques will serve as recommendations on which methods are most effective to inform future ecological restoration decisions regarding ASL removal at the Upper Newport Bay.

59. The California Seed Bank in Response to Restoration

Presenter(s): Kelsey Albarian
Advisor(s): Dr. Jennifer Funk

Southern California coastlines consist of more invaded habitats than undisturbed habitats due to the efficiency of invasive species. Invaded ecosystems are filled with exotic species that are able to put out hundreds of seeds each season. Massive seed production from invasive species outnumber the amount of seeds that California native plants are able to put into the seed bank. A healthy seed bank consists of species richness and high density of native seeds; this leads to the resistance of an ecosystem to invasive species, as seen in ancient woodlands (Goodenough and Webb, 2017). Within California exotic species, a study of the continuous burning and removal of French Broom has shown a decrease in its density within the seed bank over time (Alexander and D'Antonio, 2003). On a broader level, this research study aims to

analyze the overall health of the California native seed bank as a result of restoration efforts. Sampling soils from multiple sites ranging from fully invaded, varying year lengths of restoration efforts, and native habitats, this study looks at the density and diversity of native seeds and invasive seeds. Continuous restoration of invaded ecosystems is expected to increase the density and diversity of native seeds while decreasing the density and diversity of invasive seeds. This seed bank shift would encourage ecosystem resistance from future invasions and foster natural sustainability without continuous restoration.

60. Effect of Natural Organic Matter on Iron Oxyhydroxide Nanoparticles

Presenter(s): Sarah Hester

Advisor(s): Dr. Christopher Kim

Nanoparticles are known for their unique aggregative properties and the variability of their chemical and physical characteristics depending on the size of the individual particle. Environmental research has found that the aggregative properties of nanoparticles holds the potential to adsorb and remove harmful materials from the environment. The objective of this experiment is to observe and analyze the effect of fulvic acid on the aggregation of iron oxyhydroxide nanoparticles. The iron oxyhydroxide nanoparticles are synthesized, then treated with concentrations of fulvic acid, ranging from 0 to 100 mg/L. This mixture is allowed to shake for at least 12 hours and is then initially analyzed using dynamic light scattering which yields average diameter of the nanoparticle aggregates in nanometers. Adsorption and desorption experiments are then conducted using Zn(II). The supernatants of the resulting experiments are ran through Inductively Coupled Plasma – Optical Emission Spectrometry (ICP-OES) to measure the concentration of metal ions in the mixture. Pellets of nanoparticles are collected as well and mounted to slides in order to study them utilizing Extended X-Ray Adsorption Fine Structure Spectroscopy (EXAFS). This data will reveal where on the particle the majority of the metal ions tend to adsorb and through the desorption process where they are most often lost. We hypothesize an overall decreased adsorption of Zn (II) in conjunction with an increase in concentration of organic matter. We also expect to observe a low desorption rate because any Zn that is able to be adsorbed would likely be hindered in desorption due to the fulvic acid matrix surrounding the nanoparticle. The surface area of the goethite nanoparticles is also expected to increase along with the concentration, due to the addition of organic matter on and around the aggregates. Through these experiments, we hope to obtain a deeper understanding of fulvic acid's ability to alter both the aggregation state and the adsorptive capacity of the nanoparticles.

Health & Strategic Communication

61. WILLA: Go with the Flow — A Menstrual Health App

Presenter(s): Makenzie De Armas, Scott Weller

Advisor(s): Dr. LouAnne Boyd

This project is part of the CPSC 355 Human-Computer Interaction class. Over the semester, we have (in conjunction with our studies) proposed, prototyped, and designed our own mobile applications centered around interpersonal connectivity among students on the Chapman University campus. Our application focuses on the need for a digital forum to combat the societal taboo around menstruation—and, by proxy, uterine health. Named WILLA, the proposed application will feature two major functionalities: an online

forum for users to discuss with each other various uterine health problems, including but not limited to birth control, menstrual products, and disorders such as polycystic ovarian syndrome and endometriosis (this will create a safe space for individuals, regardless of their gender identification, to openly discuss these topics with those who may share their experiences); and a "call for help" function, which we have affectionately named the S.O.S. function, that will allow users to issue a call for help in the event of an unexpected period (users will be able to specify what menstrual products they prefer and connect with responders before approving said responder and revealing their location, while responders will also have the ability to toggle their activity/availability on the app). We hope to be able to eventually release this application in order to promote interpersonal connectivity among students who have uteri. One major goal of the application is to remove the gendering of the menstrual health conversation that permeates the public sphere, allowing transgender, nonbinary, and agender individuals to participate in the discussion. End results will be presented in our final poster.

62. Creating the Optimal Environment for the Development of Cyberinfrastructure

Presenter(s): Ashley Ima, Rochelle Salvador

Advisor(s): Dr. Kerk Kee

This research investigates an optimal environment for the development of cyberinfrastructure (CI), specifically in Universities. CI is a prime example of open source software (OSS), where users connect, collaborate, and build upon one another's work for free. Although CI is not a new technology, characteristics of an optimal environment for the development of CI are unidentified. With limited research in this area, the CI community and its stakeholders do not know what areas to focus on to further develop CI. Therefore, in order to improve CI development, we explore the factors conducive to creating an optimal workplace environment. 123 interviews were conducted in which participants (N = 20; 25% female, 75% male), professionals in the field of CI, were asked a series of open-ended questions. Through grounded theory analysis, we conclude that there are similarities between a general optimal workplace environment and an optimal workplace environment specific to the development of CI, such as collaboration, meeting employee needs, freedom, self innovation, and networking support and outreach. We also found characteristics unique to CI development: these characteristics fall under policies, incentives, rewards, organizational culture, and training. Despite the exploratory nature of our study, we argue that our findings provide future research directions for CI optimal workplace environments, which can ultimately lead to increases in productivity, efficiency, shared knowledge, and encourage more users to learn and engage in CI.

63. Justification for a Parental Media Literacy Intervention

Presenter(s): Emily Brogan-Freitas, Allie White, Hana Polizzotto, Ashley Ima, Lauren Graziani, Faith Escalera

Advisor(s): Dr. Riva Tukachinsky

Children use electronic screens at younger and younger ages, but there is nascent empirical research on how parental attitudes and beliefs interact with their children's media habits and characteristics. This exploratory study attempted to better understand how parental critical thinking skills, perception of media risk, knowledge of media effects, and media self-efficacy influence parents' mediation of children's media use and children's media exposure. An online survey was conducted in which parents of children ages 5-10 answered a series of questions about the aforementioned variables. We expect the results to

indicate that critical thinking skills, mediation of children's media use, perception of media risk, knowledge of media effects, and media self-efficacy will be positively related to one another, and negatively related to child media exposure, justifying the need for a media literacy intervention.

Health Sciences and Kinesiology

64. The Effects of Zoledronate in Sleep-Deprived Ovariectomized Rats on Bone Strength and Bone Mineral Density

Presenter(s): Erin Nolte, Cameron James, Ella Conway
Advisor(s): Dr. Frank Frisch

Osteoporosis is a disease that decreases bone mineral density (BMD) and increases risk of bone fracture by 40%, and primarily affects postmenopausal women. Executive women have an added insult of sleep deprivation which has been documented to accelerate the progression of osteoporosis by increasing known inflammatory responses that contribute to osteoclastic activity. Bisphosphonates, like Zoledronate, are commonly prescribed treatments for osteoporosis, and have been shown to retard osteoclastic activity after the loss of estrogen signaling. This study aimed to determine how Zoledronate and sleep deprivation might affect BMD and bone strength. Wistar female rats (mean weight of 341g) were ovariectomized to induce estrogen deficiency. These rats were randomly separated into four groups. The control (C, n=3) group was injected with 0.9% saline before the study and allowed 12 hours light and 12 hours dark. The Zoledronate (Z) group received an intraperitoneal injection (50 ug/kg) of Zoledronate at the same time. One sleep deprived groups (SD, n=6) were housed in chambers that did not permit sleep for 18 hours, then moved to a sleep chamber for 6 hours. A second sleep-deprived group (SDZ, n=6) was treated as the SD group but with the addition of 50 μg/kg Zoledronate before the study. Tibiae and femora were collected, wrapped in saline-soaked gauze and stored at -80F until high-resolution micro-CT, peripheral computed tomography, and a 3-point bending test were performed. The SD group did not develop BMD as well as the SDZ group (435 and 450 mg/ccm respectively; N.S.) The SD group also showed reduced bone strength compared to the SDZ group (162.21N and 165.97 N, respectively; N.S.). These data, while not statistically significant (due to the low number of animals) suggest that the use of Zoledronate may be effective in attenuating osteoclastic activity in a stress-inducing environment imposed by sleep-deprivation. We believe that future research that examines the effects of Zoledronate in a high pro-inflammatory environment may be fruitful.

65. Health and Quality of Life in Children Undergoing Elective Surgery

Presenter(s): Vivian Luong, Stephanie Munduruca
Advisor(s): Dr. Brooke Jenkins

Multiple studies have found that poorer health is associated with significantly lower quality of life when comparing children and adults with health conditions such as cancer, diabetes, asthma, and ADHD to their normal healthy counterparts. The relationship between health and quality of life, however, has yet to be examined in children who have undergone elective surgery. More than 5 million children in the U.S. undergo surgery each year. These children are often undergoing surgery for a number of health issues that may impede quality of life. Consequently, this study analyzes the effects of health on the quality of life of pediatric patients ages 2-12 who have undergone elective surgery at the Children's Hospital of Orange County (N = 86). Surveys were distributed to parents, who were asked to rate both their child's

overall health and child's quality of life preoperatively and again seven days after surgery. Health was found to be significantly correlated with the child's quality of life both before ($r(86) = .348$, $p = .001$) and after ($r(51) = .472$, $p < .001$) surgery. Specifically, children who were healthier (both before and after surgery) had higher levels of quality of life. Further, this association between health and quality of life was significant for all the quality of life dimensions (physical, emotional, social, and school functioning, $ps < .05$) both before and after surgery. This suggests that poor health can harm all dimensions of quality of life. More specifically, it can affect a child's energy level (physical), tendency to worry (emotional), ability to keep up when playing with other children (social), and ability to pay attention in class (school). Moreover, clinicians may want to consider following up on pediatric patients' quality of life in the recovery process, as their follow-up quality of life could be linked to their health status following surgery. Future studies could observe the association between health and quality of life in teenagers, an age group characterized by higher depression rates and lower self-esteem.

History

66. "Camp Families": Women in the Ravensbrück Concentration Camp

Presenter(s): Emily Claudy
Advisor(s): Dr. Marilyn Harran

The thesis of this project is that surrogate relationships, "camp families," played a crucial role in the survival of many women imprisoned in the Ravensbrück concentration camp during the Holocaust. Ravensbrück, which operated from 1939 – 1945, was the largest concentration camp for women in the German Reich. The relationships among women there assumed various configurations and were grounded in diverse interests and connections. Surrogate families were small groups constituted by women of the same or different ages who met and bonded on work details or by living in the same barrack, or even bunk. They usually shared the same language and had a similar religious upbringing. In the camp, older women were known to reach out to younger, orphaned teenagers to provide them with emotional support. Selfless gestures from members of these camp families, such as offering a slice of bread when a "family" member was too ill to stand in line for food distribution, increased the possibility of survival. Frequently, women who worked together became "camp sisters." They would endeavor to lift each other's spirits by sharing stories from their past and their hopes for the future. For example, Rebecca Teitelbaum, a Belgian Jew in Ravensbrück, risked her life to compile a book of recipes based on the conversations women had as they worked together. Such acts of resistance, however small, offered a sense of shared purpose to the women and created a strong bond of camaraderie. The "camp families" formed between women in Ravensbrück were a crucial factor in their struggle to survive the horrific conditions they were forced to endure.

67. Love and Marriage After the Holocaust: The Displaced Persons Camps

Presenter(s): Raizi Simons

Advisor(s): Dr. Marilyn Harran

This project researches the marriages that occurred after the war in two displaced persons camps for Holocaust survivors, Bergen-Belsen and Feldafing, and the diverse factors that influenced decisions to marry, particularly the factors of shared language and prior nationality. For many survivors in their 20s and early 30s, marriage was an especially high priority, even in relation to other concerns, such as locating missing family members and finding a country to which to immigrate. This thesis explores how survivors describe the circumstances of their initial meeting with their future spouse, how long after meeting they married, and the role of marriage as the first step in creating a family. Evidence will be drawn from oral testimonies in the USC Shoah Visual History Archive, memoirs, and scholarly secondary sources to substantiate the thesis that survivors' decisions to marry were shaped by several factors, including romantic attraction, the desire to create a family, and the need to be with someone who understood their experiences of the Holocaust years.

68. Motivations for Protestant Holocaust Rescuers in the South of France

Presenter(s): Rotem Azariya

Advisor(s): Dr. Marilyn Harran

While there has been much research conducted about Jewish victims and Nazi perpetrators during the Holocaust, this project delves deeper into the topic of gentile rescuers who risked their lives to save those targeted by the Nazi regime. Although many Europeans were Christian, comparatively few were motivated by their Christian faith and beliefs to become rescuers of Jews. André Trocmé, a Protestant pastor in the French village of Le Chambon-sur-Lignon and a dedicated pacifist, inspired and empowered the residents in his village to accept all who sought refuge, thereby saving over 3,000 Jews during the Holocaust. The Huguenot Protestants in Le Chambon had themselves experienced religious oppression in the 16th and 17th centuries, and this experience gave them a deep sense of empathy for those who were persecuted. Additionally, the Huguenots had a broad concept of Christian duty grounded in the belief that loving and thus protecting their neighbors was an essential demonstration of their love of God. Another Huguenot pastor in southern France, Pierre-Charles Toureille, was motivated by his Protestant faith and a sense of shared history with the Jewish people to initiate rescue efforts. By providing Jewish refugees with fake paperwork, Toureille was able to save hundreds of Jews from the French internment camps that served as the lethal portal to Nazi death camps. Based on research in primary and scholarly secondary sources, this paper argues that Protestants in the South of France became rescuers due to their own historical experience of persecution and their theology that understood Jews as their neighbors in need—thereby emphasizing commonality rather than differences.

Mathematics

69. Creating Numbers from Numbers: New Connections between Number Theory and Statistical Physics

Presenter(s): Kyler Zach

Advisor(s): Dr. Daniel Alpay

Is there a way of producing numbers that have similar properties and characteristics as a given number? If so, how would we approach this problem, and are there different ways of doing it? How can we produce a new sequence of digits from a given number without plagiarizing it? These questions will be addressed from a computer science and mathematical perspective. There are perhaps other ways of answering these questions; however, in this paper I present three different methods of generating new numbers. We get our inspiration for our first approach from some work that biologists have done. Here, they work with pairs of proteins and are able to predict their interactions based on the principle of maximum entropy. Our second approach is a simplified version of the first method, because it deals only with musical notes; therefore, it is less complicated than prognosticating protein interactions. The final method is entirely different than the others and is based on Sinkhorn iterations. All three of these approaches produce numbers that are similar (but not plagiarized) to the original number. Unfortunately, each of these methods are computationally expensive; therefore, we do not have any results yet. However, Dr. Alpay and I are not concerned as we will keep working to achieve this goal. Once we finish building the codes for each method, we will be able to argue which method produces the best results through various numerical tests and mathematical theory.

News and Documentary

70. Terrorism in Mass Media

Presenter(s): Jenna Perry

Advisor(s): Dr. Ann Gordon

Modern terrorism, a form of political violence, relies heavily on the coverage it receives from mass media in order to gain power and influence viewers. While the acts of terrorism itself may influence the beliefs of Americans, this study focuses on the media's coverage of terrorism. There is little existing research that investigates the effects of media on social marginalization in American society. Therefore, this study attempts to test the association, if any, between the use of mass media and the level of fear of terrorism in the United States, taking into account that fear may be a citizen's motive for specific policy preferences. The effects of said level of fear will be discussed in relation to discrimination, such as stereotypes and immigration rights of Middle Easterners. Specifically, variables including age, political affiliation, race, religion, form and frequency of mass media used will be studied. In addition, the media outlets' political leanings will be taken into account as they may generate varying levels of fear for their viewers. The report seeks to discover whether conservative or liberal media outlets result in higher levels of fear. Chapman University's Survey on American Fears (CSAF), a nationally representative survey, will be utilized for secondary data analysis.

Physics

71. Enhancing Optical Metrology Through the Manipulation of the Direction Asymmetry of Polarizers

Presenter(s): Gabriella Nutt, Abby Bechtel

Advisor(s): Dr. Justin Dressel, Dr. Jerry LaRue

We investigate a characteristic behavior of laser light interference that allows for extreme sensitivity to small polarization rotations of a laser beam. Optical metrology is extremely important in both the physical and life sciences. The success of our project provides a cheaper, more accessible, and practical way of taking measurements in the optical metrology community. We explore different designs for manipulating the formerly unnoticed directional asymmetry of a series of optical polarizers to magnify small angular rotations of a beam's polarization. We simulate the expected experimental results using python as a virtual prototype for future experiments.

Political Science

72. An Analysis of Population Density and NIMBYism in Orange County

Presenter(s): Alexander Thomas

Advisor(s): Dr. John Compton

California was once a state of great builders-- from the California Aqueduct to the Golden Gate Bridge, the state's legacy of grand projects remains visible today, and construction has fundamentally altered its natural landscape. But lately, California seems to have stopped building. Housing construction has slowed to levels unprecedented in recent history, and the state recently abandoned its grand ambitions for the first high-speed rail line in the United States. The rise of the NIMBY movement (short for "Not In My Back Yard") over the past several decades has fueled an increase in vocal public opposition to development, like affordable housing and transit projects. California's housing crisis worsens by the day, and NIMBYism represents a major obstacle to the long-term sustainability of the state and a challenge to meeting the needs of each community. This paper uses public opinion data from the 2018 and 2019 Orange County Annual Surveys to provide an overview of the relationship between population density and NIMBYism through the lens of Orange County. Orange County is large, diverse, and multipolar, but escalating home prices and the lack of effective transit alternatives pose major threats to its long-term sustainability. By examining the link between density and attitudes towards development, this paper attempts to provide a roadmap to help elected officials and city planners to determine where advocacy for large-scale projects can be the most effective and politically feasible.

73. The Prediction of Public Opinion on U.S. Immigration Policy Based on Socioeconomic Status and Political Ideology

Presenter(s): Ali Wartenberg

Advisor(s): Dr. Ann Gordon

Among the most debated topics in the political realm today is immigration and even more so how the government should react to those wishing to enter the country, with opinions on the topic ranging from support for lenient, open-door policies to those that would see the government impose more stringent requirements or even entirely closed borders. This paper focuses on the public opinion of the immigration policy of the United States, and whether there is any correlation between a person's opinions on immigration and immigration policy, their socioeconomic status within the United States, and their political ideology or party affiliation. The data for this analysis comes from the American National Election Studies and takes into account respondents' demographic information and responses to questions regarding immigration policy. Additionally, research stemming from a variety of previously published works regarding the topic and related variables is also taken into account. These sources and data culminate in an explanation of the correlation between these variables and the reasons for them to provide a better understanding of how they can predict people's opinion on matters relating to immigration in the United States and the policies surrounding it.

74. Burden on the American Economy: Fear-Based Immigrant Sentiments

Presenter(s): Bryce Kauffman

Advisor(s): Dr. Ann Gordon, Marisa Cianciarulo

The reasons for anti-immigrant sentiments in the United States -or any political belief- are difficult to derive. The lack of accurate information in the current political discourse, on this topic, has shifted the public debate from a logical line of reasoning. For example, while there is bipartisan promotion of economic prosperity, the current trend of immigration reform fails to account for the beneficial effect of immigrant labor and consumption on the growth of the United State's economy. Currently, the propagation of anti-immigrant sentiments and myths surrounding immigration policy have grown in tandem. The primary dataset used will be the Chapman University Survey on American Fears to investigate the factors and anxiety which affect an American's perception of immigrants. The expected results are that the media habits, socioeconomic status, religious beliefs, level of education, race, trust of the government, and political beliefs will affect an American's perception of immigrants. The first few tentative hypotheses possible are that the lower an American's socioeconomic status the greater their fear of immigrants, the more conservative news an American synthesizes the greater their fear of immigrants, and that members of the majority race of the United States -Caucasians- are more likely have increased fear of immigrants.

75. Green Politics: Economic Development in Colombia

Presenter(s): Daniel Espiritu

Advisor(s): Dr. Sandra Alvarez

The issue of economic development doesn't exist only in terms of profit and loss. The nature of its processes makes it inextricably connected to the issues of territory and identity, in the sense that social and ecological displacement is often necessary. The inter-relationality of these three concepts is especially visible in the context of Colombia, where ethnic groups have organized to resist the colonial logic and practices of their own government and of multinational corporations. This project seeks to investigate how marginalized groups in Colombia interpret the question of economic development, and how those groups exercise agency in the struggle to maintain their community's well being and ways of life. It begins by discussing the history of modernity, territoriality, and economic development in Colombia. Then, attention is given to the political actions of marginal communities in the context of Colombian civil war. Specifically, focus is given to indigenous and Afro-Colombian communities; the reason being that these groups have often pursued shared interest through actions of solidarity. This project aims to contribute both decentered perspectives practical applications in environmental action to the larger discourse on development in its relation to the global environment. The expected conclusion is that Colombia's marginalized communities will have valuable contributions to make in this arena of discourse, and that social scientists will be able to develop counter-hegemonic conceptualizations of politics based on those contributions.

76. Predictors and Profiles of Conspiracy Believers

Presenter(s): Emily Lam

Advisor(s): Dr. Ann Gordon

What drives Americans to believe in conspiracy theories? One answer could be the lack of trust and transparency between many American citizens and the United States government. Conspiracy theories have been used throughout history as an explanation for events and situations that were carried out by the government without any credible evidence. However who believes in them? Using Chapman University Survey of American Fears, this paper will explore the predictors of beliefs in conspiracy theories, who believes in which theories, and whether certain theories are believed over others. The predictors being explored are age, ideology, ethnicity, education, and religion. In the case of this paper, the conspiracy theories being covered are John F. Kennedy's assassination and the collusion between Trump's administration and Russian officials. Additionally, there's a conception that those believing in conspiracy theories tend to be older citizens, however, recently conspiracy theories have become a trending topic among the youth due to popular YouTubers such as Shane Dawson and Buzzfeed's Unsolved. This is important because one could begin to see a possible shift in those who believe in conspiracy theories. If the research displays an association between the predictors and conspiracy theories, it will allow us to understand who believes in theories and which one they believe in. The expected result for a John F. Kennedy assassination conspiracy believer is over the age of 65, white, conservative-leaning, with limited education and no religious affiliations whereas the collusion between Trump's campaign and Russian officials conspiracy believer is under the age of 65, white or non-white, liberal-leaning, achieve higher education and has no religious affiliation.

77. Did Americans Vote Their Pocketbooks in 2016?

Presenter(s): Jessica Grima

Advisor(s): Dr. Ann Gordon

Does the personal financial situation of American voters determine how they will vote in presidential elections? The promises made by presidential candidates to the public attract a significant amount of attention in their race to the White House. However, the effects of these promises on how voters choose a candidate remains unexplained. The theory of pocketbook voting can be used as a possible explanation into how people choose their respective candidates. It seems reasonable to believe that voters examine and rate candidates based off of how their policies and agendas will affect their "pocketbooks". Essentially, voters are interested in determining which party or presidential candidate will be able to provide them with the highest personal economic utility. To understand whether Americans do in fact believe this to be true, this research will analyze responders from the 2016 National Election Survey, delving into how voters assessed their own personal financial situation, viewed the state of the national economy in 2016, and evaluated the handling of the economy under the Obama Administration.

78. The Reasons for Public Opinion on Foreign Policy

Presenter(s): Maria Kachulis-Moriarty

Advisor(s): Dr. Ann Gordon

In recent years, especially under President Trump's administration, United States foreign policy has seen a great deal of changes, as has public opinion on U.S. foreign policy. Foreign policy faces increasing criticism and scrutiny as information about international trade and relationships between countries becomes more accessible to the public. This paper will address public opinion on current U.S. foreign policy with regards to eight countries – Russia, North Korea, Israel, Mexico, China, Canada, Germany, and Saudi Arabia – and how it may differ based on variables such as a person's age, economic status, or party affiliation. These variables are vital to understanding the public's voting behaviors and tendencies, as well as their stances on public policy, including foreign policy. Since public opinion has a large effect on election outcomes, it is important to understand how the aforementioned variables can change a voter's stance on foreign policy, as this often alters how a candidate markets themselves to a specific audience while campaigning. Foreign policy decisions are often made in line with public opinion, which holds politicians accountable to their constituents. Therefore, it is also increasingly important to understand that a person's ability to understand U.S. foreign policy and develop an informed opinion regarding policy decisions is largely a result of the variables mentioned above. This paper will address the effects of these variables on an individual's opinions regarding the United States foreign policy for the eight countries listed above.

79. The American Gun Gap: An Analysis of the Impact of Gun Ownership on Voting Behavior

Presenter(s): McKenna Etheridge

Advisor(s): Dr. Ann Gordon

The United States is uniquely characterized by its attachment to firearms and the right to defend oneself from danger, along with a population of millions of gun owners and registered firearms. The debate on gun control has become a significant factor in American voting behavior, and gun owners in particular are becoming more politically active according to a recent study. In one study conducted in 2017, gun ownership was proven to be a significant factor in voting behavior, leading them to vote either Republican or Democrat. Therefore, it is important for political researchers to take interest in this rising political group as they are proving to have an influence on election outcomes, and gun ownership now plays a factor in voting. The American National Election Survey (ANES) in 2016 provides the data set for this research study, utilizing the variables that ask how many firearms a respondent owns and who they voted for in the 2016 Presidential Election. The "number of firearms owned" variable is recoded into two ways: ownership versus non-ownership, and non-ownership versus varying degrees of ownership (small to extremely large arsenal). The focus of this study is not on the gun control debate, but the influence of gun ownership on the decision to vote Republican or Democrat, layering on other demographic factors, specifically race and gender. Gun ownership comes in varying degrees, so it is likely that there could be an influence there as well, giving reason to explore its effect on voting behavior. Only a few studies have been done relating to this topic, so a new analysis of this topic alongside some different variables will provide new research on an increasingly significant voting group in the US.

80. Fear of Climate Change: Motivations for and Impediments of Mitigation Efforts

Presenter(s): Nicole Saito

Advisor(s): Dr. Ann Gordon

Fear of climate change in the United States is seen as the prerequisite to effective mitigation efforts, which are understood to quite literally be a matter of life and death. Past macro-theories have cited faulty economic reasoning, inadequate education, and cultural influence as causes for a lack of fear of climate change without effectively analyzing fear on the individual level or exploring its effects on mitigation efforts. Using the Chapman Fear Survey, this paper will explore three variables—age, political ideology, and media exposure—as determinants of individual fear of climate change and then analyze the causes of those connections. Overarchingly, it will challenge the base assumption that fear motivates mitigation and explore its previously obscured effects. Although macro-level action is necessary to combat climate change, as pre-existing research correctly asserts, action on the part of the individual cannot be overlooked. Furthermore, the vital role of fear in influencing action cannot be taken for granted. Conclusions will include suggestions of incorporating wide-scale changes such as reformed interpretation of economic models and revised education and outreach to make inaccessible scientific and economic research available and worthwhile to the public as well as a different paradigm through which to approach climate change activism, thereby combining the macro-theory and the micro-theory to form a tangible solution. Understanding how to communicate the issue of climate change logically and accurately to different age groups and party members in an accessible and inclusive manner is vital in forming a unified front that advances mitigation efforts.

81. Beliefs on Immigrant Crime in America: How to Predict the Opinions of the People

Presenter(s): Sarah Kashani

Advisor(s): Dr. Ann Gordon

In current American politics, immigration is a hot topic issue that seemingly divides the two largest parties in the nation. More and more American's are believing that immigrants are the ones responsible for the crimes being committed and fear that if more immigrants are allowed in, that America will see a rise in crime. Relying on The Chapman Survey of American Fears, this paper connects how opinions on immigrant crime can be affected by the media watched by voters. This analytical piece uses correlating data on the age and political affiliations of those surveyed in order to give a well-rounded picture when similar patterns are documented. Utilizing the Chapman survey, my article presents cohesive figures on the predictors that result in people believing either positively or negatively that immigrants are causing more crime in America than US citizens. This composition displays data that shows if a person is under the impression that immigrants are causing the crime in the US, they tend to be more conservative, older, and watch Fox News over other news sources. On the opposite side, the information presented in my document connects a pattern that youth who are more liberal and watch news channels such as CNN do not believe immigrants are causing more crime that US citizens. These data sets add new clarification to our understanding of attitudes towards immigrants and immigration. It outlines how age, political identity, and the news sources watched can predict biases towards issues such as immigrant crime in America.

82. The Fear Produced from Media Use of Climate change

Presenter(s): Tara Madden

Advisor(s): Dr. Ann Gordon

In the past year the fear of climate change has skyrocketed, making it one of the most feared, above crime and terrorism. ANES survey data has recorded the many factors in the current political climate, that may have affected this recent change in the fear of the potential threat of climate change. Political ideology can heavily impact an individual's thought process on the matter and is examined as a factor. Depending on the party that you are affiliated with, the news channel you choose to watch may affect your attitude on the impending problem, that is climate change. Newspaper titles and local news stories influence their audiences and can often create this fear of an apocalyptic world, with exaggerations or amplifications of a problem. If humans feel like the problem is out of their control, they will most likely not seek to reform policies. Social media is also a tool used to communicate opinions or facts on climate change, where people can react to the information they have read or watched. For example, the president uses twitter to communicate his thoughts on the reality of climate change, a platform in which individuals can react to his comments. The lack of awareness towards climate change that the president has expressed on Twitter, is also a major factor in the production of fear. In recent years climate change has become more and more discussed, with the progression of coastal storms, wildfires, and the unnatural cold front across the United States. The article will demonstrate how increased climate change communication will continue to spark fear in humans, and what factors are the leading causes to that fear.

83. The Filter Bubble Effect and the Rise of the Alt-Right

Presenter(s): Zacharias Estrada

Advisor(s): John Compton

As Americans search for answers in the wake of Unite the Right, the arguments of internet activist Eli Pariser in his 2011 book, The Filter Bubble are overwhelmingly relevant today. Briefly, the concept refers to "narrowing or limiting of a person's intellectual perspective based on web content provided by personalized search technology." The algorithms used by websites like YouTube, Google Search, and Facebook that were originally intended to personalize content are now having unintended side effects on political information and debate, such as the sharp rise in "fake news" leading up to the 2016 election. This paper looks at the Filter Bubble effect from the angle of Alt-Right radicalization, and asks the question, is there a plausible connection between the effects of Filter Bubbles, echo chambers, and cultural tribalism and the rise of white nationalist sentiment? The initial study of the paper examines criticism of the Filter Bubble effect, an introduction to internet democratic theory, and a review of the emerging scholarship on the Alt-Right. The paper then juxtaposes the existing theory with independent data study using (primarily) the Democracy Fund's 2010-2018 Voter Study groups to track voting behavior over time. The data relies on an identification of a set of identifiable behaviors that can be concluded to be linked to Alt-Right/Far-Right rhetoric using variables such as (but not limited to) "Social media usage," "Immigration attitudes," and "Favorability toward Trump." The author argues that as society shifts closer toward a more complete integration between society and the technology it uses, understanding the behavior of a militant group radicalized through the internet requires a more complete understanding of how the internet works. It is also the author's hope that this work may be used to advocate for a greater presence of digital citizenship instruction across academia.

Psychology

84. Exploration of Qualitative Data in Secondhand Smoke Clinical Trial

Presenter(s): Ava Hargett, Hashini Weerasekera

Advisor(s): Dr. Vincent Berardi

Background: Project Fresh Air Project Fresh Air (PFA), developed by researchers at San Diego State University and Chapman University, is a randomized intervention trial focused on decreasing unhealthy air particle levels in the homes of participants. Each home was outfitted with two air quality monitors that collected air quality data in near real-time for the researchers. The monitors were equipped with aversive auditory and visual stimuli (lights/beeps) that were set off when the air quality reached a threshold of unhealthiness. Coaching Visits During visits, coaches asked prepared questions, and participants were shown a detailed graph of their particle emission. Additionally, participants were asked to come up with SMART (specific, measurable, attainable, realistic, time specific) goals to help decrease their emission. As the coaching sessions continued, participants were asked about their progress and whether they wanted to create any new goals. Participants were also asked about any obstacles they felt like they would encounter, and how they could avoid them. Method The PFA design called for four different coaching visits spaced by two-week intervals. To determine adherence to this schedule, we created a dataset, and for each home visit, we noted if the visit happened and whether an audio recording existed. We also made

note of the interviewer, and the language it was conducted in (Spanish or English). Additionally, we transcribed several of the recordings so we could have a written document of the sessions to better help us analyze the findings and find common themes between the participants' experiences in PFA. Preliminary Results While our qualitative analysis of the audio recordings is still very much in progress, we have begun to look for emerging themes within the transcriptions. Many of these "themes" are related to the participants' obstacles or goals, and as we move forward with our transcriptions and qualitative analysis, we hope to identify more patterns amongst the audio data.

85. Who Is Happy With Their Bodies? Predictors of Body Image in a National Sample

Presenter(s): Skye Sakashita, Emily Rauchut

Advisor(s): Dr. David Frederick

Despite the important role of body image in daily life, there are few national studies examining how people feel about their bodies. The primary purpose of this study was to examine the sociocultural factors and individual differences that predict people's evaluations of their appearance. Through a survey posted on Mechanical Turk, heterosexual (n = 6868), gay/lesbian (n = 282), and bisexual (n = 554) men and women completed the Body Image Quality of Life Inventory, as well as measures of Surveillance, Appearance Evaluation, and the Social Attitudes Towards Appearance Questionnaire (SATAQ-4). Only half of people reported that their feelings about their bodies had a positive effect on their quality of lives overall. Perceived sociocultural pressures were important predictors of body image for men and women, but women reported experiencing these more intensely. Surveillance, though correlated with body dissatisfaction, was not a strong predictor. The study investigated and highlight the factors that promote positive body image.

86. Where's the Line? Exploring the Effect of Attachment Style and Gender on Responses to Infidelity

Presenter(s): Chris Costa, Stacy Vo

Advisor(s): Dr. David Frederick

Previous research has shown that 99% of married couples expect some kind of sexual infidelity in their relationships (Treas & Glesen, 2000). Infidelity has been shown to elicit strong emotional responses ranging from rage to diminished self-esteem to depression (Cano & O'Leary, 2000; Charny & Parnass, 1995). The purpose of this study was to assess whether attachment style (secure, anxious-preoccupied, fearful-avoidant, avoidant-dismissive) predicted individual's likelihood to terminate their relationship in response to different forms of infidelity ranging from sexual (intercourse) to emotional (buying gifts). Our sample consisted of 427 adults (56.9% female, 43.1% male) and were gathered using Amazon's MechanicalTurk. Participants responded to measures of attachment style, and then rated their likelihood to break up over various measures of infidelity. Our research found that attachment style was marginally related to break up intentions in response to a spouse fantasizing about a celebrity, $F(3, 424) = 2.537$, $p = .056$. Anxious-preoccupied individuals were most likely to break up across all measures, and avoidant dismissive individuals were least likely. Significant gender differences were found across a number of measures, especially when pertaining to emotional or non-sexual measures. Attachment style was not a strong predictor of differences in infidelity response, but our study did come back with a number of

notable gender differences in infidelity response. The finding that gender differences were largest on non-physical measures is consistent with research in evolutionary psychology that proposes emotional infidelity is particularly troubling for women because they are cues of potential abandonment and diversion of resources. The most notable finding was also the largest sex difference observed; upset over a partner making out with someone of the same sex. This is incongruent with evolutionary psychology, and may be due to differences in perception of homosexual acts by gender, either due to evolutionary adaptation or socialization.

87. Prenatal Anxiety, Parenting Self-Efficacy, and Postpartum Depression

Presenter(s): James Roberts

Advisor(s): Dr. Laura Glynn, Dr. Tara Gruenewald

Pregnancy requires an array of accommodations and demands that can be anxiety-provoking for expectant mothers. Yet despite the potential for anxiety during pregnancy relatively little attention has been devoted to the study of risk factors, moderators, and consequences of prenatal anxiety. Previous research does indicate that prenatal anxiety is a risk factor for the onset of postpartum depression (PPD) (Heron, O'Connor, Evans, Golding, & Glover, 2004), a prevalent mental health disorder that affects 10% of all mothers worldwide (World Health Organization). Thus, a greater understanding of the risk and protective factors for the development of prenatal anxiety, as well as factors that moderate the potential links between prenatal anxiety and PPD, may have significant public health benefits. Previous research has found that parenting self-efficacy expectations are negatively associated with prenatal anxiety (Wernand, Kunseler, Oosterman, Beekman, & Schuengel, 2014), but to date no studies have investigated how parenting self-efficacy expectations interact with prenatal anxiety in predicting the onset of PPD. The goal of the current study is to investigate the occurrence of prenatal anxiety, its association with PPD, and parenting self-efficacy as a moderator of anxiety-PPD associations, in expectant mothers in the Pregnancy Experiences and Infant Development Study, a longitudinal study of pregnant mothers and their offspring. Prenatal anxiety will be examined as a predictor of PPD at 2 and 6 months postpartum and parenting self-efficacy expectations will be examined as a potential protective resource that moderates this association. Consistent with previous research it is hypothesized that greater prenatal anxiety will predict greater risk for PPD but that this association will be weaker in mothers with greater parenting self-efficacy. Study findings will contribute to our knowledge of the prevalence of prenatal anxiety, its role in the development of postpartum depression, and the potential protective role of parenting self-efficacy.

88. Learning to Persevere - Analyzing the Effects of Positive Reframing of Life Challenges on Grit

Presenter(s): Chris Costa

Advisor(s): Dr. Tara Gruenewald

Grit as defined by Duckworth et al. 2007 is "trait-level perseverance for long-term goals" and is one of the newest topics of research in the field of psychology. Grit has been studied in terms of life success, and has been shown to predict success and retention the US Marine Academy (Maddi et al. 2012). Many research studies have shown evidence that grit has been more powerful in predicting overall life success than IQ or SES. Most of grit research has pertained to it's correlates, or what grit predicts. Past research however,

has not established what factors may predict the development of grit. The purpose of the current study is to determine whether or not challenging life experiences contribute to the development of grit. The current hypothesis posits that experiencing challenges socially and academically during early development will yield higher grit scores. Social challenges consist of being bullied by peers either verbally, physically in a violent way, physically but nonviolent, or cyberbullied. Academic challenges consist of failing a class, failing an academic grade/year, or struggling with a subject to the point of receiving outside instruction (e.g. tutoring). Our secondary hypothesis is that positive reframing, or the degree to which the individual was able to turn a negative experience into a positive one, will also dictate the degree of grit development that occurs. Higher levels of positive reframing in conjunction with challenges are predicted to yield the highest grit scores. Participants will be given a survey via Chapman's Qualtrics survey software which will measure grit score, and then asked if they have experienced each type of challenge. Challenges will be followed by positive reframing measures (e.g. "I was able to find a silver lining in this challenge). With proper results, we believe this study may have the potential to be one of the first in the field to empirically support life experiences that contribute to the development of grit. This data would yield numerous benefits for the field of social, behavioral, and clinical psychology.

89. Effects of Primed Hope and Message Frame on Pro-Environmental Advertising Effectiveness Abstract

Presenter(s): Jyelyn Bold
Advisor(s): Dr. Tara Gruenewald

As environmental challenges mount across the globe, the development of effective pro-environmental appeals takes on greater significance. One key characteristic to investigate is whether pro-environmental appeals should utilize gain (praising the benefits of a pro-environment action) or loss (emphasizing the negative consequences of not acting) frames. Prior research suggests that gain-framed green advertising may be more successful (Segev, Fernandes, & Wang, 2015). However, the success of gain versus loss frames may depend on the receiver's emotional state. Loss-frames have been found to be more persuasive when participants are in a positive mood and gain-frames when in a negative mood (Keller, Lipkus, & Rimer, 2003). Such effects also extend to specific emotions. For example, gain-frames have seen to be more effective when paired with guilt and loss when paired with shame (Baek & Yoon, 2017). One set of emotions which may be relevant to the world's growing environmental challenges, but which have received little empirical attention, are hope and hopelessness. This study is examining how the primed emotions of hope and hopelessness affect the effectiveness of gain- and loss-framed environmental messaging in an online experiment of up to 300 participants. It is hypothesized that gain (loss) framed messages will be more effective in increasing individuals' future pro-environmental behavioral intentions when viewers are primed with hope (hopelessness). Study findings will contribute to the optimization of pro-environmental ads in terms of gain/loss and emotion framing.

90. Senioritis or Socioemotional Selectivity? An Investigation of Goal Variations in Students at the Beginning versus Ending of Their College Trajectory

Presenter(s): Nasma Kublawi

Advisor(s): Dr. Tara Gruenewald

Cartensen's (1999)'s Socioemotional Selectivity Theory (SST) asserts that changes in goal and emotion regulation often observed with advancing age may be due to variations in time horizons. Older adults, often perceiving a more finite time horizon, tend to regulate goals in ways that maximize emotional satisfaction. The present study applies SST to explain hypothesized variations in extant goals and the importance of different goals for college in first-year versus senior college students. Seniors face a shorter time horizon than their younger counterparts which may shape variations in importance for socioemotionally-oriented goals. This hypothesis is tested via a comparison of endorsed aspirations between freshmen (n=100) and senior (n=100) college students as assessed with the Aspiration Index (Kasser & Ryan, 1996); seniors are expected to more strongly endorse the importance of socioemotional goals while freshmen will more strongly endorse informational, achievement-oriented, or superficial goals. The underlying hypothesized mechanism of a shortened time horizon is further tested by randomly exposing participants to a horizon manipulation or no manipulation and then asking all participants to rate the importance of a series of goals for their college career and their top goals for their remaining time in college in an open-ended essay. It is hypothesized that students' exposure to their varying time horizons will lead to a larger discrepancy in the endorsed goals between seniors and freshman as compared to seniors and freshman in the no horizon manipulation condition. Condition-blinded linguistic analysis and thematic coding will also be utilized to assess the extent of socioemotional goal orientation in analyses and potential class-standing variations in the horizon versus no-horizon condition. Study findings will contribute to our understanding of the role of socioemotional selectivity processes in explaining previously observed variations in the goals and goal-directed activity of college students at different phases of their college trajectory.

91. Perceived Discrimination and Social Well-Being: Moderation by Race, Spirituality and Religiosity

Presenter(s): Alexis Rivera

Advisor(s): Dr. Tara Gruenewald

Greater experience of lifetime and everyday discrimination on the basis of race and other factors have been linked to poorer mental and physical health (Paradies, 2006). Research indicates that non-Hispanic blacks experience major lifetime and daily discrimination to a much greater degree than non-Hispanic whites (Kessler et al., 1999) yet they often exhibit more favorable profiles of psychological and social well-being (Keyes, 2009). Keyes identified religiosity as a key potential resilience factor worthy of future study. The present study examines the role of race, religiosity and spirituality as moderators of the associations between discrimination experience (lifetime and daily) and social well-being in non-Hispanic blacks and whites in the second wave of the national Study of Midlife in the U.S. (MIDUS; n = 4,963, age 33-85 years). Eleven forms of lifetime discrimination experience (e.g., hassled by police, not hired for a job) and the frequency (1-never to 4-often) of daily discrimination (e.g., receive poor service, called names/insulted) were assessed. Social well-being was assessed through items meant to measure concepts such as

meaningfulness of society, social integration, acceptance of others (social acceptance), social contribution, and social actualization (Keyes, 1998). Items are coded using a bipolar scale from 1 = strongly agree to 7 = strongly disagree. Multiple regression analyses will be utilized to examine the hypothesis that greater discrimination experience will be associated with lower social well-being and that race, religiosity and spirituality will moderate these associations Study findings will contribute to our understanding of the role of religiosity and spirituality in acting as a dampening factor in links between discrimination experience and poor social well-being and how these associations might vary by race.

92. Similarly Attached? An Examination of the Connections Between Relationship Attachment Style and Attachment to Work

Presenter(s): Alyssa Switaj

Advisor(s): Dr. Tara Gruenewald

Attachment styles develop in childhood and are rooted in characteristics of parent-child relationships. However, these styles are then carried forward and often serve as the foundation for the development of attachment styles in adult romantic relationships (Hazan & Shaver, 1987). Although the study of adult attachment styles has primarily focused on their role in romantic relationships, these styles represent generalized beliefs about trust and commitment that may extend to other relationships. As many adults maintain a "relationship" to work and the individuals in their workplace, it is plausible that one's relationship attachment orientation may influence how they attach to their work, including their level of commitment to work. The present study examines the relationship between different attachment styles and one's commitment to work. It is hypothesized that adults with secure attachment will have the highest level of affective commitment and the lowest level of continuance commitment. Adults with avoidant attachment will have the highest level of continuance commitment and the lowest levels of affective commitment. Adults with anxious attachment will have the highest level of normative commitment and slightly lower levels of affective commitment. One hundred employees from a single workplace are being surveyed regarding their attachment styles and commitment to work. Adult attachment is being measured with the Experiences in Close Relationships Scale and work commitment with Allen and Mayer's 3 Component Model of Organizational Commitment. Demographic and job characteristics will be included as covariates in analyses. Study findings will clarify the association of adult relationship attachment styles to different forms of commitment to work. Such knowledge may aid organizations in understanding how different attachment orientations influence workplace commitment and inform efforts to optimize employee commitment to workplace organizations and subsequent performance and productivity.

93. Revising the Triangle: Utilizing Factors from Sternberg's Triangular Theory of Love to Predict Marital Dissolution

Presenter(s): Bella Bendix

Advisor(s): Dr. Tara Gruenewald

It is estimated that approximately 40 to 50 percent of marriages will eventually end in divorce. Demographic factors, such as age at marriage, education, and income are known predictors of divorce risk, but less is known about the role of psychological factors in predicting marital dissolution. Sternberg's

Triangular Theory of Love (1986) emphasizes three necessary components for an ideal relationship: intimacy, passion, and commitment. Research has shown that all three aspects of the triangle are related to relationship satisfaction, with intimacy and commitment being the strongest predictors (Madey & Rodgers, 2009). Couples lacking in these areas tend to display lower relationship satisfaction. While Sternberg's theory has been applied to a variety of studies assessing relationship satisfaction, it is rarely used to assess divorce. This study will examine Sternberg's triangle components as predictors of marital dissolution over time. It is hypothesized that marriages high in intimacy and commitment will remain stable and intact. Marriages low in intimacy and commitment are predicted to end in divorce. A lack of passion is predicted to weakly influence marital dissolution. Participant characteristics including gender, presence of children, and remarriage status will be examined as potential moderating factors. Data comes from the Marriage Matters Panel Survey of Newlywed Couples which included three waves of data collection. Participants (n = 1,271) were surveyed at each timepoint about various relationship, personal, and familial topics. Sternberg components were measured with a self-report questionnaire assessing intimacy (4 items), commitment (4 items), and passion (4 items); all items were rated on different numerical scales. Divorce occurrence was assessed at the second and third follow-up assessments. Analyses will predict odds of divorce (yes/no) at each follow-up as a function of relationship characteristics. This study will examine whether components of a classic theory of relationship satisfaction predict the likelihood of future marital dissolution.

94. Is Altruism Born of Suffering? Links Between Early Life Adversity and Prosocial Behavior in Adulthood

Presenter(s): Erica Green

Advisor(s): Dr. Tara Gruenewald

Is altruism born of suffering or does early life adversity dampen the likelihood of prosocial behavior in adulthood? The limited empirical literature on this topic to date provides support for both of these perspectives. For example, there is evidence which suggests that positive life experiences enhance, and negative experiences dampen, the likelihood of altruism. On the other hand, the altruism born of suffering hypothesis suggests that the experience of some forms of adversity in early life promote altruistic behavior in adulthood. In a first study, we are examining early life adversity experiences as predictors of prosocial behavior in adulthood in the national Study of Midlife in the United States (MIDUS; n=4,963; age 35-84). Early life adversity experiences are assessed with the Conflicts Tactic Scale (assesses childhood emotional and physical abuse) and a life events inventory which assesses 34 negative life events (e.g., death of a parent, flunking out of school) and the age of occurrence (those before age 19 will be used as indicators of early life adversity experience). Prosocial behavior is assessed as time spent volunteering, providing support to others, and donations to charity in adulthood. A second online study is recruiting 100 undergraduate students to complete the Adverse Childhood Experiences Inventory, the Five-by-Five Resilience Scale, the Self-Report Altruism Scale, and a behavioral intention measure of altruism (willingness to participate in a future study without credit or compensation). In line with the Altruism Born of Suffering hypothesis, it is expected that greater early life adversity will be associated with greater prosocial and altruistic behavior in adulthood. Taken together, these two studies will provide an important test of the hypothesis that early life adversity may promote prosocial behavior and the role that a resilient disposition may play in this association.

95. Femvertising: Changing the Consumer Landscape

Presenter(s): Sophie Rubin

Advisor(s): Dr. Tara Gruenewald

Femvertising, advertising that employs pro-female talent, messages, and imagery to empower women and girls, is a novel marketing strategy that has evolved as a result of an ever changing socio-political landscape. With the third wave of intersectional feminism, evidenced by the #MeToo movement and Women's March, companies are shifting their branding message. While females are the primary household purchasers, there is still a resounding number of companies that continue to subscribe to the "sex sells" mentality, featuring overly sexualized, distorted and photo-shopped women in their campaigns (Artz & Venkatesh, 1991). The message is clear: women must change to fit a mold, as opposed to being celebrated the way they are. Objectification theory, body dysmorphia and depression in women provide evidence that justifies the need to study these advertising practices and understand how women internalize media. This online study is comparing whether femvertising or non-fem (traditional sexualized) print campaigns are more effective in eliciting product and brand interest, and whether the two ad campaign types are associated with differential views of women amongst female consumers. It is expected that female consumer participants will exhibit higher product and brand interest and more positive views of women when exposed to a femvertising campaign as compared to a traditional, non-fem campaign. Study findings will contribute to our understanding of how female consumers respond to femvertising campaigns and associated products.

96. Religiosity, Spirituality, & Attitudes Toward Drug Use

Presenter(s): Caroline Kutschbach

Advisor(s): Dr. Tara Gruenewald

Drug abuse is a growing epidemic in the current culture with young adulthood a period of vulnerability for increased substance use. Attitudes toward substances have been found to predict an individual's use of a drug. Religiosity has been found to have a negative correlation with substance use. Interestingly, young adulthood is a time of religious and spiritual exploration. The present study aims to examine how religion and spirituality are correlated with substance use attitudes. Participants recruited through Chapman University were asked to fill out a survey with questions regarding their most prominent social group, their personal attitudes toward the use of different illicit substances, their perception of the attitudes of others, and asked to identify a potential reason someone would use a particular substance. One substance from each illicit drug category was chosen for measurement (e.g. Xanax, cocaine, psilocybin mushrooms, Adderall), as well as legal substances (e.g. tobacco, alcohol, and marijuana). Participants were given the Brief Multidimensional Measurement of Religiosity and Spirituality, which assesses multiple domains of religiosity and spirituality. Analyses will examine if higher religiosity is associated with less positive attitudes towards substance use, with the exception of alcohol. Spirituality is expected to exhibit a mixed profile of association across different substances, with higher spirituality associated with less favorable attitudes towards some substances (e.g., barbiturates), but more favorable towards others (e.g., psychedelics). Reasons for favorable attitudes towards use of a substance, such as religious/spiritual practices, and self-knowledge/introspection, will also be examined for association with spirituality and religiosity. Study findings will enhance our understanding of the associations between religiosity, spirituality, and favorable attitudes towards multiple forms of illicit and legal substances.

97. Children's Age and Parental Behavioral Response in the Post Anesthesia Care Unit

Presenter(s): Ashleigh Dimpflmaier

Advisor(s): Dr. Brooke Jenkins

Children who undergo surgery often experience pain as a result. Looking at how adult behavior influences children's postoperative pain is an important element for understanding how to help children learn to cope with pain from surgery. Research suggests parents' use of reassurance (e.g., "don't worry" or "it's going to be okay") and/or empathy (e.g., "I know it's hard") to comfort their child when in pain may actually increase a child's pain. This is because these strategies direct a child to focus on his or her feelings of pain without providing a way to alleviate pain. One important question is with which children are parents most likely to use these behaviors. Therefore, this study investigated the association between parents use undesired behaviors such as empathy and reassurance and child age. Parents (N = 72) were recorded in the post anesthesia care unit (PACU) and their behaviors were coded for empathy and reassurance. The age of children was also collected. Children were on average 5.79 years old (SD = 2.74). Results indicate that parents are more likely to use reassurance ($r(58) = -.399$, $p = .002$) and empathy ($r(58) = -.274$, $p = .037$) with younger children as compared to older children. These findings also indicate that parents of younger children should even more so be the target of parent behavior interventions to limit the use of these behaviors. This would aid in making adult behavior interventions more effective in minimizing children's pain because this is the age group most affected by undesired parental behaviors. Better understanding how adults respond to children's pain and how to modify this behavior could be what helps minimize children's postoperative pain.

98. Characterising the Ability to Transfer Learning in Human Randomness

Presenter(s): Alice Wong, Rebecca DeAngelis

Advisor(s): Dr. Uri Maoz

Human attempts at random-sequence generation (RSG) have been shown to underestimate the likelihood of long runs of repeated entries. This bias can be reduced in a competitive environment with feedback (Bar-Hillel, 1991). We investigated whether participants could transfer this learning from such a competitive environment back to a non-competitive environment. Participants carried out a 3-part experiment where: (Part A) RSG of Rock (R), Paper (P), or Scissors (S) to establish baseline performance, (Part B) played a competitive game of R-P-S against a computer, and then (Part C) again RSG of R-P-S as in part A, to measure any post-learning transfer effects. This experiment had 3 between-subjects conditions for Part B. In conditions 1 and 2, the computer searched for patterns in each participant's response and to predict the participant's move, whereas in condition 3, the computer followed a simple R-P-S-R-... pattern (85% of the time and drew randomly from R-S-G the other 15% of the time). In conditions 1 and 3, the participants were told nothing about the computer algorithm and only instructed to play to win, while in condition 2 they were specifically informed about the computer's pattern-searching strategy and told to be as random as possible to win. We computed each participant's randomness score and found evidence that participants indeed produced more random sequences and longer runs in part B than in parts A or C. The participants' patterns in part B were not statistically different than Matlab's pseudo-random number generator. While participants' randomness in part B of conditions 1 and 2 were not reliably different, only those in condition 1 showed transfer learning from part B to C. Our results suggest that humans can learn to become random in a competitive situation with feedback and maintain that randomness for other tasks, but only if the ability is learned implicitly.

99. Freedom and Free Will: Impact of Phrasing on Intuitions

Presenter(s): Jake Gavenas

Advisor(s): Dr. Uri Maoz

Recent studies have investigated layperson intuitions about free will and related concepts. Some have found actions born of free will to be associated with deliberation and reaching goals (e.g. Stillman, Baumeister, and Mele, 2011). However others have found spontaneous actions with little to no consequence are rated as more free (e.g. Deutschlander, Pauen, and Haynes, 2017). Perhaps asking about free will versus free action probes two distinct concepts. We asked laypeople (n=626; MTurk) to rate scenarios according to concepts related to free will (freedom, free will, will, ability to do otherwise, individual expression, and being in control of a decision; between subjects). Scenarios varied by consequences (lunch vs. new job; within subjects) and by decision type (picking decision vs. easy choosing decision vs. difficult choosing decision (see Ullman-Margalit and Morgenbesser, 1977); within subjects). Results indicated that the consequences of a decision did not impact free-will-ratings overall ($p = 0.873$), nor did arbitrary vs deliberate overall ($p = 0.176$; however, there was a significant interaction with type of question asked, $p < 0.001$). There was a significant main effect of the type of question asked ($p < 0.001$). Bayesian analysis further suggests little to no effect of consequence (BFInc=0.338), while question type, decision type, and interaction between the two are significant (BFInc=inf. for all). In-depth results, discussion of implications, and potential follow-ups are included.

100. "Eye" Decide: Using Pupillometry to Assess the Onset of Conscious Intention

Presenter(s): Jake Gavenas, Andy Liang, Amber Hopkins, Tori Erickson, Alee Rudis

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

The well-known Libet experiment (1983) found that unconscious brain activity (RP) began several hundred milliseconds before subjects reported they consciously decided to carry out a simple movement (he termed this self-reported moment W-time). This finding, which has been well replicated (e.g. Haggard & Eimer, 1999; Schurger, Sitt, & Dehaene, 2012), suggests that our decisions are made unconsciously (or pre-consciously), and we only later become conscious of them. According to this interpretation, W-time marks the (attentional) shift from a preconscious state to a conscious intention. However, W-time has been demonstrated to be a very problematic measure of intention onset, if it reflects this onset at all (e.g., Banks & Isham, 2009; see Maoz et al., 2015 for a review). At the same time, recent studies have shown that pupillometry can be used to quantify and track preconscious content and attentional shifts (e.g., Einhäuser, Koch, & Carter, 2010; Laeng, Sirios, & Gredebäck, 2012; Kang & Wheatley, 2015). So, it is plausible that pupillary responses would correlate with W-time. Such a pupillary response could serve as an external and objective measure of W-time in future research, moving those away from problematic measures relying on self-report. It would also enable participants to focus on the given task instead of splitting their attention between a task and clocking intentions. Lack of such a correlation may support the hypothesis that W-time is inferred post-movement. Here we replicate previous findings (Richer and Beatty, 1985) that pupil size increases in a "ramp" like fashion beginning about 1.5 seconds before voluntary movements. We also present preliminary findings about the relationship between W-time and pupillary responses.

101. Subject-Specific Neurofeedback for Mood Improvement

Presenter(s): Jake Gavenas, Andy Liang, Jye Bold, Joceline Llvovich-Balanko, Victoria Caldera, Amber Hopkins

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

While medication and therapies are often effective treatments for depression, certain forms of depression are treatment resistant (e.g. Keller, 2005). Treatment alternatives are therefore desirable and are currently under exploration. Neurofeedback lets participants self-regulate their brain activity to a desired state via real-time measurements, analysis, and appropriate feedback. Some studies find electroencephalography (EEG) neurofeedback to be a viable treatment for depressive symptoms (Choi et al., 2009; Zotev et al., 2011) However, it is unclear how well features in EEG data generalize across individuals (e.g. Li et al., 2018). This brings into question the external validity of studies which rely on such features for targets of neurofeedback. We propose to investigate the efficacy of individually-tailored EEG neurofeedback. During a first session, participants will be induced to happy, sad, and neutral moods (preliminary proxy for depression) while their EEG is measured. We will then extract features and train machine-learning and deep-learning algorithms to classify EEG by mood in real-time. During a second session, participants will self-regulate towards a happy mood with the help of feedback given by this classifier. Changes in mood will be compared to participants in a sham control group. We expect a greater improvement in mood in the feedback group compared to control. The use of individually-tailored classification algorithms is novel in EEG paradigms. Using subject-specific methods will both increase the internal validity of our findings and, hopefully, improve treatment efficacy. Preliminary data and results from piloting will be presented and discussed.

102. Compact 3DOF Driving Simulator Using Immersive Virtual Reality for Ecological Decision Making

Presenter(s): Jungsu Pak

Advisor(s): Dr. Uri Maoz

We constructed a driving simulator using a 3-DOF motion platform (DOFreality H3) and a head-mounted virtual reality headset (Oculus CV1). Our intention was to keep it affordable, keep its spatial footprint low, while maintaining robust functionality. By providing synchronized visual and vestibular stimuli, we were able to reduced simulator-sickness-induced nausea while, at the same time, enhancing the realism of the driving simulator and thus enhancing immersion in the environment. The driving simulator facilitates the study of deliberate decisions in a rich environment that is nevertheless completely under our control, especially with simultaneous recording of EEG using a mobile EEG system. For example, we will predict decisions while driving from EEG (and potentially driving history) as a form of deliberate decision-making.

103. Robotic Arm Illusion

Presenter(s): Akima Connelly, Jungsu Pak

Advisor(s): Dr. Uri Maoz

The rubber hand illusion is an experimental paradigm that induces sense of ownership over a rubber hand. This is achieved through congruent and synchronized tactile stimuli on the rubber hand and participant's hand. Along with the tactile stimulation, we are using a robotic arm to create a similar illusion by using proprioceptive feedback, where EMG is used to read the movement of participant's arm. We want to see how the participants' senses of ownership and agency are affected by different combination of stimuli.

We are using the WidowX by Trossen Robotics, which is a 6 degrees of freedom robotic arm built with an Arduino interface. Matlab is used to communicate between the EMG, the Robot arm, and the computer. Both a questionnaire and time perception (intentional binding) are used to measure participants' sense of agency. We hypothesize that using the robotic arm to copy the movement of the participant's arm will lead to a strong sense of agency over the action of the robotic arm.

104. The Trolley Problem

Presenter(s): Emma Rothleutner, Jungsu Pak
Advisor(s): Dr. Uri Maoz

Trolley problem is a famous, philosophical thought experiment, where a person has to choose between killing five people through inaction or one person through action. In most such settings, subjects are given a battery of moral problems as text vignettes and respond to them one after the other. Preliminary previous research has suggested that placing the driver in a virtual-reality (VR) setting might alter their preferences. But no clear, systematic studies have been carried out to test the effect of VR on the trolley problem. We propose to do just hat using a VR driving simulator. Subjects will drive around in the simulator and suddenly encounter the trolley problem. This setting will enable the subjects to actively make a decision and carry out the action. We will further measure EEG to monitor the participant's brain waves and further place sensors on the participant's body to collect postural data.

105. Perceptions of Agency and Stimulus Onset Asynchrony

Presenter(s): Morgan Kindel, Amber Hopkins
Advisor(s): Dr. Uri Maoz, Dr. Aaron Schurger

When a voluntary motor action (i.e. a button press) is paired in a temporally consistent manner with an external sensory event (i.e. an audio tone), we experience the feeling of agency, such that we perceive that action as a causal trigger for the specific sensory event that follows (Desantis et al., 2011; Moore et al., 2011). Once the initial action-sensory event association is formed, perceptions of agency remain fairly steady, even when the established temporal distance (stimulus onset asynchrony, or SOA) between an action and response stimulus is modified, so that timing of the response stimulus is no longer consistent with the motor response (Stetson et al., 2006; Desantis et al., 2014). Despite being a studied, well-replicated phenomenon, there have been no attempts, to our knowledge, to determine ranges of SOAs in which perceptions of agency remain intact. The purpose of this study is to establish the distribution of SOAs in relation to perception of agency. In the first part of this study, participants complete a task where a response audio tone is consistently presented after a button press. In the second part of this study, the SOA will be randomly presented at various intervals, either before or after the button press. Following each trial, participants rate their perception of agency. We expect that SOAs that only slightly deviate from initial SOA will result in a consistently strong perception of agency. We also expect to see a decrease in perceived agency as SOA deviations (from initial SOA) increase. Interestingly, deviations in perceptions of agency have been identified in a wide variety of neuropsychiatric disorders such as schizophrenia (Riemer, 2018) and obsessive-compulsive disorder (Giuliani et al., 2017). If we are successful in determining a distribution in a neurotypical population, these findings could potentially be used in the development of new cognitive tests that aid in the diagnosis and symptom monitoring of these disorders.

106. Measuring Body Movements and Evaluating Relaxation in a Sensory Deprivation Tank

Presenter(s): Demi Segura, Maks Bialek, Tian Lan

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

Our research involves studying the body motion of participants inside a sensory float pod, or sensory deprivation tank, using body-motion sensors. A sensory deprivation tank is a pod that attempts to shut out all as much sensory input as possible. One is therefore surrounded by complete darkness and silence while they are floating in salty, buoyant, body-temperature water, which enables the participants to float without feeling any touch perception. This state often induces profound relaxation and promotes many benefits, such as pain reduction (Bood et al, 2009), enhanced creativity, and better sleep (Jonsson and Kjellgren, 2014). It also can cause mild visual and auditory hallucinations in some cases (Daniel and Mason, 2015). We intend to see how these phenomena manifest physiologically. We will also study other potential benefits, such as improving athletic ability (Driller and Argus, 2016) and cardiovascular health (Kjellgren and Westman, 2014). To record data, we place motion trackers around the body on the hands, elbows, knees, feet, and the forehead which capture the amount of body movements that occur in these areas. After each floatation session, we ask the participant to complete a self-report survey, where they report their degree of relaxation during the floatation. We then compare the self-reported results with the data from the motion sensors to determine any correlations. We hypothesize that people will feel most relaxed in the body parts that move least. By gathering simultaneous neural data (using electroencephalography), we will further understand how the brain and body functions in the absence of sensory stimuli and the potential benefits.

107. Romantic Resilience: Fractal Conflict Dynamics and Dating Satisfaction

Presenter(s): Melanie Reilly

Advisor(s): Dr. David Pincus

Existing research demonstrates that numerous psychosocial dynamics display fractal properties. Fractal structures are characterized by branch-like patterns that are self-similar and consist of exponentially more small events compared to large events. Examples include: shifts in physiological arousal; shifts in self-esteem; patterns of traits within personality; and recurrences in behavioral flows and small group interaction dynamics. Furthermore, across various psychological (and other natural science domains), these fractal patterns have been shown to provide resilience to complex adaptive systems by allowing for flexibility in response to changing adaptive pressures. Specifically, fractal dynamics allow systems to adjust on both a large or small scale without becoming stuck or falling apart. The present study aims to extend this line of research to examine conflict dynamics over time in dating relationships. An experience sampling methodology was used to assess conflict, relationship satisfaction, and commitment levels three times daily for 30 days (n = 90) for undergraduates self-identifying as being in a monogamous relationship. Hypotheses (each dependent of the former in numerical order): (1) ratings of conflict over time will conform to a fractal distribution, with exponentially more small conflicts than large ones; (2a) moderate levels of fractal dimension (i.e., flexibility) and (2b) higher structural integrity (i.e., fit to fractal distribution) will be associated with higher levels of dating satisfaction and commitment; (3) The strength of network ties (i.e., reactivity) among conflict satisfaction and commitment will have a significant

correlation with both fractal structure and with relationship satisfaction, with lower reactivity predicting higher satisfaction; and (4) Fractal structure will moderate the relationship between conflict and satisfaction, with more flexible and well-integrated fractal structure buffering the impacts of conflict on dating satisfaction. Preliminary results will be presented and discussed.

108. Effects of a Restrictive Mindset on Episodic Memory Performance

Presenter(s): Morgan Kindel

Advisor(s): Dr. Jessica Walker

Research has identified a relationship between episodic memory and appetite, suggesting that poor episodic memory results in overconsumption. Despite support for this relationship in healthy and overweight populations, there have been no studies, to our knowledge, that have investigated a role for episodic memory in populations that chronically and consistently under-eat (restrictive eaters). Moreover, previous studies in this area have not examined the cognitive and environmental factors that could influence episodic memory strength to serve as a mediator for eating behavior. Here, we investigated the effect of both pre-existing and experimentally induced restrictive mindsets on episodic memory, for food and non-food related objects. Restrictive and non-restrictive eaters were assigned to an experimental mindset condition, in which they were exposed to either control or diet-related stimuli. This was followed by an episodic (source) memory test across two sessions. We hypothesized that participants with both pre-existing and experimentally induced restrictive mindsets would have stronger memories for food-related items compared to those with non-restrictive mindsets. Preliminary results support this hypothesis. Source memory (SM) for food items was significantly better for restrictive eaters than non-restrictive eaters. We identified a significant interaction for SM performance between item type in the control and prime mindset conditions. In the control condition, Food SM was significantly worse than non-food SM. In the prime condition, there was no significant difference in food and non-food SM performance. Together, these results suggest that both pre-existing and experimentally induced restrictive mindsets strengthen episodic memory for food-related information. Provided that episodic memory strength has shown to interfere with eating, our findings provide insight into how exposure to diet/weight related information in restrictive eaters may influence maladaptive eating behavior.

Religious Studies

109. Religious Entrepreneurship

Presenter(s): Issac Hwang

Advisor(s): Dr. Gail Stearns

The modernity of 21st century has led church leaders to confront a dilemma of whether or not their churches need to embrace entrepreneurial skills and business management to run their respective churches. The dilemma arises from leaders and the congregation who oppose the adaptations and acceptance of entrepreneurship in a church setting. The argument will be made that entrepreneurial skills and management are skillsets needed by church leaders to run their churches. Theological reasoning will be given as well to support the adaptations of entrepreneurship by the churches and other religious institutions. The importance of entrepreneurship will be supported by examining five different areas. The five areas will be studying ecclesiastical polity, the incorporation of church, biblical accounts, management of a church, and even the possible downfalls of entrepreneurship in churches. The five areas will present

not only theological reasons but also how our contemporary society is already constructed to embrace entrepreneurship. The research will entail how the establishment of a church is based on entrepreneurship and how leaders of churches need entrepreneurship to effectively manage their congregation. The ethical implication of entrepreneurship will be discussed along with the benefits entrepreneurship will produce for the church as a religious institution.

110. Nostra Aetate: Pathways to Peace

Presenter(s): Lorianne Frelly

Advisor(s): Rafael Luévano

In 1965, during Vatican II, Pope Paul VI promulgated a document entitled "Declaration on the Relation of the Church to Non-Christian Religions", commonly referred to as "Nostra Aetate". The aim of the document was to clarify the Catholic Church's relationship with other world religions and proclaim its intention to work with these religions to solve the world's issues. This study will demonstrate that "Nostra Aetate" responds to religious differentiation by (1) encouraging dialogue and collaboration between Catholics and other religious traditions whose locus is not Jesus Christ, by (2) following God's command to love one's brothers and sisters and advancing respect for each person's dignity, and by (3) calling on people to defend through word and deed those who are religiously persecuted. These principles are then applied specifically to the relationship Catholics hold with Muslims and Jews as evidenced in contemporary United States Jewish-Catholic and Muslim-Catholic dialogues. Through these applications, the lasting impact of "Nostra Aetate" is highlighted, and it is proven that the implementation of these principles take time and that true authentic interreligious dialogue is a long-term commitment.

Software Engineering

111. Haha: A Platform For Creatives

Presenter(s): Madison Tomihiro, Brent Jang

Advisor(s): Dr. LouAnne Boyd

Human-Computer Interaction is the process of creating user experiences that enhance and augment the way people work, communicate, and interact. Our professor challenged us to create an application focused on enhancing social connectedness, specifically at Chapman University. Through our research, we discovered a gap in the market for a platform that connects student creatives and developers as well as a lack of opportunity for students to collaborate on real projects that will give them the experience necessary to attain relevant internships and explore possible career paths. In order to better understand the context for which we were designing as well as to create designs focused on users' needs, we solicited feedback from a wide range of college students, created user personas and scenarios, and performed A/B tests. Our solution is hapa, an ios application that connects creatives (graphic designers, photographers, videographers, marketers, developers) at the university level by allowing them to connect and collaborate on projects. With this application, we hope to create an online community for amateur creatives and connect students interested in a variety of industries. In full, our application will allow students to message, post their own work, upload joint projects, create joint calendars, assign tasks and due dates and give and receive feedback on their portfolios. Our platform will support the ideas of combining multiple disciplines, meeting people in various industries and empowering students to explore new mediums and turn their ideas into tangible products.

Theatre

112. Staged Seminar - Luis Valdez's Zoot Suit

Presenter(s): Zacharias Estrada

Advisor(s): Dr. Jocelyn Buckner

Combining the lessons of the v-effekt in Brecht's Epic Theatre and Boal's encouragement of the "spect-actor" in Theatre of the Oppressed, the Staged Seminar is a critical, active reading of a dramatic work as it is happening. Stylistically inspired by the "absurd realism" of Taylor Mac's Hir and what I have coined the "deadpan satire" of Brandon Jacobs-Jenkins' Appropriate, the format is intended as a way of bridging the gap between admittedly dense academic material with the immediacy and relatability of theatre. Here, the practitioner is challenged to use performance as a vehicle for engagement with a social topic they deem important, while still paying attention to the Aristotlean aspects that define dramatic theory. It is a disagreement with Epic Theatre's proposition that the audience should feel "alienated" when in performance - such a stance is contradictory to the very dialectical nature of performance. If theatre is a conversation between first the creators and then the audience, then the conversation should at least make use of the rhetorical tools that make theatre engaging. This research project looks to develop the idea of the Staged Seminar by applying it to Luis Valdez's 1978 Zoot Suit. Using the aforementioned concepts, the Staged Seminar uses the play to engage with the question of toxic masculinity, and more specifically, Machismo/Marionismo culture within the Latinx community. For over 2000 years, drama has been a key democratic device in shaping cultures: a society is both defined by the stories they make and the stories they see. The Staged Seminar then, is a way of including both the makers and the see-ers in the process even more prominently. This research project combines intersectional feminist theory, criticism of Machismo/Marionismo, close readings of four plays within the Latinx theatre canon, and one outside (Hir). The overall goal is to produce a dramaturgical companion that can be used as a reference point for the creative team of the first Staged Seminar.

Visual Art Presentations- Session I

Wednesday, May 1 | 3:30PM-4:30PM

Argyros Forum Student Union

Art

Power to the Immigrants

Artist: Hashini Weerasekera

Advisor(s): Micol Hebron

This is a social justice poster that is 15 x 21 inches in the medium of digital media. I was inspired by the artistic styles of Emory Douglas, who was a significant designer for the civil rights movement. I was also influenced by my own interest in the topic of immigration rights to create this piece. Emory Douglas created simple and bold posters to get the message across to all audiences. I wanted to keep the poster simple yet powerful. I used bold colors in the background to help show the contrast of the boy, and kept the text simple to get the message across upon one glance at the poster. I think this piece taps into crucial and unspoken issues even in our society today, and how while we rally for the rights of people, we sometimes forget that immigrants are people too. We forget the unforgiving lives they are fleeing from and the promising futures they are trying to achieve. Both my parents are immigrants, so this topic is very near and dear to my heart. I could not imagine the life I would be living if my father didn't come to America and with everything that is going on in the political world today, I wanted to create a voice for those unborn children and families who deserve to make their lives here too.

Social Justice Poster: Abortion

Artist: Jeanna Polisini

Advisor(s): Micol Hebron

This is a social justice poster that discusses the topic of abortion. The 18x24 digital inkjet print poster was created in Photoshop and inspired by the American artist, Allen Ruppersberg. Ruppersberg's work have revolved around themes such as, movement between places and self-portraiture. In his works, he utilizes the regular use of American vernacular culture including, books, posters, and magazines. The digital inkjet print poster is made up of multiple posters, in order to illustrate the different point of views of pro life vs. pro choice. Throughout the work, I have emphasized certain words to catch the viewers attention and to emphasize the message of the piece, such as MY body MY choice. Pro life arguments are presented on the top row, while the pro choice arguments are represented on the bottom of the poster. Although, the middle poster reads, "I would NOT be here," which exemplifies how conflicted I am between each side. I was adopted from Guangzhou, China when I was just ten months old in the year 2000; This was during the time of the strict one child policy. As I have grown up, I have constantly questioned the odds that I would end up in California, the land of opportunity, to a loving family who has supported me through everything. Though, what if I was a boy, what if I grew up in China, or what if I was aborted. While I am adopted and I should be all for pro life, I still find myself in the middle with my conflicted thoughts because I understand the pros and cons to each side.

Смерть фашизму (Death to Fascism)

Artist: Kati Dean

Advisor(s): Micol Hebron

For our Digital Imaging class, we created posters in the style of historic artists and graphic designers centered on a social justice issue important to us. My poster was inspired by the Russian artist Aleksandr Rodchenko, who is most famous for his poster designs advertising a myriad of products for the newly-formed Soviet Union. I decided to address the current issue of rising interest in fascist ideas in the Western world, particularly Central and Eastern Europe, in this poster. This issue is important to me because I have a great love for Central and Eastern European culture, but today, the region is exhibiting political trends that are extremely worrying to me. Keeping with Rodchenko's often patriotic messages in his designs, I looked at this issue from the perspective of a Russian anti-fascist. The text, translated into Russian, reads "Death to Fascism! / We defeated it before / We must do it again." Here, I referenced Russia's historical struggle against fascism in World War II as well as the region's current ideological struggles. Regarding the poster's design, I emulated Rodchenko's clean, geometric design elements, and his striking color palette of black, white, and red. In the center of the poster is a fist smashing a swastika, one of the key symbols of the anti-fascist movement.

Visual Art Presentations- Session II

Wednesday, May 1 | 4:45PM-5:45PM

Argyros Forum Student Union

Art

A

Artist: Erica Hu

Advisor(s): Micol Hebron

This is a digital inkjet printed social justice poster formatted at a size of 2100 x 1500 using Adobe Photoshop. The design of the final poster is inspired by Corita Kent's stylistic use of stencil font, complementary colors, and scribble writing. With the combinational implementation of color and words, personal passion and experience surrounding the topic of the "model minority" is expressed. The idea of a model minority is seemingly positive at first. However, it is detrimental not only in households but also in relation to assistance programs, college admissions, etc. Specifically, immigrants from Asia who are working towards the concept of the American Dream have a similar goal for their children. This results in extreme parenting styles and removes children from their personal dreams. Instead, the strive for a career with stereotypically higher incomes are favored. Additionally, enforcing the idea that Asian stereotypes "aren't really that bad" further discredits individual achievements and individuality. With the repetitive placement of "Asian" on the design, a wavy structure of the word is meant to replicate spoken words. The large "A" overlapping the other words on the right side of the poster resembles a multitude of aspects. "A" for "Asian." "A" for "A+." "A" for "American Dream." A difficulty to understand the internal troubles one has with the model minority label is represented with the illegible white writing inside the large A. One piece of text that is comprehendible is located at the bottom, reading "Dreams are supposed to come true." This brings the American Dream into question, and also plays with the idea of breaking expectations outside the Asian community.

Rewriting History with WiFi

Artist: Samantha Webster

Advisor(s): Micol Hebron

This is a poster that I made for my Digital Imaging class with the medium of Digital Ink Jet Print. The size of my poster is 24 x 13.5 inches. This was a piece where we had to represent a tale with a moral to it by putting ourselves into a painting from history. I chose to represent the story of the other side of the wall. A young woman plants the seeds of the most magnificent flowers. As time goes on, the women became extremely frustrated because no flowers bloom. She remains devastated, as her neighbor on the other side of the wall shrieks with joy. The flowers ended up blooming on the neighbor's side of the garden. The moral of the story is that just because you do not get to see the good results of your labor doesn't mean that it bore no fruit. The background painting I chose was Alfred de Breanski's, "A Devonshire Garden," painted in 1912. In my version of the story, I satirize that our society is more concerned with connecting to the Internet than admiring the beautiful nature around us. In the first scene, I am kneeling as I try to fix the Wi-Fi router. Next, you can see that I am wandering the garden, phone in hand, with frustration as I cannot get a connection. Lastly, my neighbor in the third scene is shrieking with her hands in the air because her garden now has Wi-Fi.

Digital Arts

The Ugly Duckling

Artist: Grace Gallucci

Advisor(s): Micol Hebron

This is a poster made for my digital imaging class. The project required interpreting a story of choice and then putting yourself into a famous painting. The story I chose was The Ugly Duckling by Hans Christian Andersen. The painting is The Japanese Footbridge by Claude Monet. In my version of the ugly duckling I am depicting first in the left hand corner myself as an outcast sitting alone by the pond, similar to the ugly duckling. I have a mirror resting beside me as I had just been gazing at my outer appearance and am upset by what I see. Next, I can be found standing on the bridge peering into the water holding a makeup brush. I decided I wanted to put a modern twist on the ugly duckling by displaying how society puts pressure on women to wear makeup in order to be beautiful. The last image on the right hand side displays me then spreading my “wings” and showing off my now beautiful appearance. If you look closely though you can see my face is still downward and somber because all society likes me for is the beautiful dress and made up appearance, but not the person I am without it. For editing the photographs of myself, I used layer masks in order to hide and reveal certain filters I put on them. I used the pointillize filter in order to make the images look more like paint strokes and then did a color match adjustment to match the backdrop photograph. The impressionist smudge tool brush also helped in creating more stroke like effects over the images and with blending them into the backdrop. The filter gallery also was used for a sponge effect to once again make the image appear painted.

Visual Art Presentations- Session III

Wednesday, May 1 | 6:00PM-7:00PM

Argyros Forum Student Union

Art

Trust in Black Women

Artist: Sofia Montgomery

Advisor(s): Micol Hebron

This is a digital design social justice poster that is 18x24 inches. It is inspired by artist and social activist Andrea Bowers. While some of her work focuses on the issue of immigration, my poster focuses on the topic of intersectionality. The definition of intersectionality is: the complex, cumulative way in which the effects of multiple forms of discrimination (such as racism, sexism, and classism) combine, overlap, or intersect, especially in the experiences of marginalized individuals or groups. My personal definition of intersectionality is the discrimination and prejudice against an individual that is African American and a woman.The poster reads 'Trust in Black Women', which is a simple act, but a difficult concept. Due to stereotypes, preconceived notions, and other condemning factors, it has been difficult for particular individuals to trust the words and actions of black women. I chose this topic out of many because it's difficult for young women be heard in this day and age, and although times are changing, there are many factors that continue to hold their voices hostage. However, it is even more difficult for a young black woman to be heard because as the most prominent minority, we are easily looked over during discussions in which we have much to contribute to. In my poster, the word "Trust" is the largest for of text because it is the first thing that I want the viewer to do, to trust in what they're seeing. The color and pattern of the composition then draws the viewer's eyes to the smaller text that reads "in Black Women", completing the phrase. Although "Trust" is the first word seen, "Black Women" is the focal point of the poster.

I'm Not Being Herd

Artist: Hannah Scott

Advisor(s): Micol Hebron

This is a digitally produced social justice poster inspired by the artist Linder Sterling. Linder Sterling was a prominent artist throughout the 1970s, particularly famous for her photography and radical feminist photo collages. I was deeply inspired by her series where she took black and white photographs of nude, or provocatively posed, women and placed large, bright flowers over their faces. I found the lack of identity of the women in the pieces compelling, and it got me thinking about how we do not often give the animals we are consuming a personal identity, besides "steak" or "burger". With creating my social justice poster, I want to bring light to the reality of factoring farming and the mistreatment of animals in the food industry. In the poster, a cow is shielded by a flower from a cattle gun trying to kill the cow. The arm holding the cattle gun is from the film No Country For Old Men, where the main villain Chigurh uses a cattle gun to murder his victims. Choosing to use the arm of a murderer who uses a cattle gun made me think about the idea of murder, and where society draws the line of who or what we can kill, and when it counts as murder. I hope to inspire those who view my piece to think: is meat murder?

Portrait of a Woman

Artist: Ji Won Lim

Advisor(s): Micol Hebron

In my art and research I explore women artists and the role of women in art. The truth is that women artists have never been treated equally in the art world (with regard to representation, historicization, value), and this problem hasn't been getting any better. Women artists are widely underrepresented in galleries, museums, auction houses, and more. This video is one part of an ongoing and larger exploration of different facets of my own identity. In this piece, Portrait of a Woman, I am thinking about my body as both the artist and the subject. When I walk around the stretcher bars, reaching for the other side with my body, I become the artist and creator. The line between artist and subject get blurred as I step in front of the canvas. I stretch my skin, thinking about my skin becoming the canvas to be stretched. A majority of the most expensive paintings to be sold feature nude women as subjects. The same museums and galleries that exhibit these male artists fail to include women artists in equal numbers. Of the top 20 most popular art exhibitions around the world in 2017, only one was by a female artist. The central themes that recur in my art are femininity, sexuality, inequality towards women and themes of race and place in the United States.

Visual Art Exhibition

Monday, April 30- Friday, May 10

Argyros Forum Student Union Gallery

Power to the Immigrants
Hashini Weerasekera
Digital Inkjet Print

I'm Not Being Herd
Hannah Scott
Digital Inkjet Print

Trust in Black Women
Sofia Montgomery
Digital Inkjet Print

Who is Responsible for Global Warming?
Kamy Arakawa
Digital Inkjet Print

Social Justice Poster: Animal Testing
Grace Hill
Digital Inkjet Print

I'm Tired
Elle Chapman
Photography

Social Justice Poster: Abortion
Jeanna Polisini
Digital Inkjet Print

A
Erica Hu
Digital Inkjet Print

Welcome Graduating Class ;
Alexis Espinosa
Digital Inkjet Print

Rewriting History with WiFi
Samantha Webster
Digital Inkjet Print

Смерть фашизму (Death to Fascism)
Kati Dean
Digital Inkjet Print

A Message from the President
CorinneTam
Flag, ink

Representation
Kara Bass
Colored pencil, alcohol-based pen

***Don't Tell Me to Smile**
Nicole Daskas
Video Art

***Portrait of a Woman**
Ji Won Lim
Video Art

*Video Submissions displayed during Visual Art Presentations -Wednesday, May 1 | 3:30PM-7PM

Poster Presentations- Session II

Thursday, May 2 | 9:30AM-11:00AM

Sandhu Conference Center

Art

1. **The Singular Woman**

   Presenter(s): Helena Walker

   Advisor(s): Dr. Wendy Salmond

This project is an examination into the historiography of canonized female artists. It critiques both the constructed idea that there is a single token woman in each period and what the criteria for becoming that woman is. I'll be looking into Artemisia Gentileschi, Camille Claudel, and Frida Kahlo as female artists that have transcended their field, as well as others who haven't. The case studies will center around their work, and their contemporary rises to fame, and their forgotten female contemporaries. This will culminate into challenging western ideas of canonization and survey and argue for a change into a microhistory based system of pedagogy through the wider idea of tokenization.

2. **A Seat at the Table: The Intersection of Activism and the Artistic Practice of Charles White, Norman Lewis, And Alma Thomas.**

   Presenter(s): Danielle Cobb

   Advisor(s): Dr. Wendy Salmond

Innovators of the Harlem Renaissance used literature, music, and art to express the truth of the black experience in America. This research project will focus on three artists associated with the Harlem Renaissance; Charles White, Norman Lewis, and Alma Thomas, and the evolution of their artistic practice as it parallels key developments in interwar and postwar America. This project will also examine the politics of exclusion and its historical implications today. Finally, this research will explore the role of black activism and the art world, specifically as it concerns the American museum apparatus as an institution of exclusion.

3. **Current Research into Facial Aesthetic Perception**

   Presenter(s): Yuee Guo

   Advisor(s): Dr. Wendy Salmond

This paper examines the conditions that inform the recognition of facial beauty from the context of aesthetics and perception. The discourse of face aesthetic perception offers numerous approaches to decode conditions in which perception occurs, and what comprise contents of such perceptions. I select three Cubist portraits, by Georges Braque, Picasso, and Peter Keil, to illustrate how relevant cognitive penetration persuades audiences of the aesthetic value contained in their pieces. Among the pertinent concepts encompassed in this examination include an inquiry of the justification for considering or holding some objects or images as more beautiful than others (an inquiry of what entails aesthetic value and consequently beauty distinction) and lastly, how aesthetic pleasure is derived from these visual experiences and perception.

4. **Keith Haring: Silence=Death**

Presenter(s): Nellie Jalalian

Advisor(s): Dr. Wendy Salmond

The American aids crisis is one of the most important epidemics of the contemporary world, yet many americans do not know the severity of the crisis or the true lasting effects on recent society. In my project I will go over personal accounts of individuals directly affected by the illness, like famed artist Keith Haring, to give it a more human perspective. I will also reflect on the art that was created at the time, and how that was reflective on the people affected. Aids is an immunodeficiency virus that has been proven difficult to diagnose in the early on years. It had a lacking in public interest because it was regarded as a "gay disease", which resulted in the death of about 700,000 individuals in the U.S. at the time. The disease took the lives of many famed individuals such as Freddie Mercury, Eazy-E, and Keith Haring. I will focus on the accounts of Keith Haring because he documented his life and fear of the illness in many diaries and in many of his works. He produced many works that highlighted his views on how conservative America viewed the aids crisis, as well as creating the Keith Haring Foundation.

5. **Deceit and Gridlock: The Ongoing Battle Between Russia and Germany Over Looted Artwork**

Presenter(s): Anne Cole

Advisor(s): Dr. Wendy Salmond

During World War II, the Soviet Union looted thousands of artworks from sculpture to paintings from Germany and the Nazi regime. According to Russia, the pieces were taken to cover the costs and damages that the Germans brought on their country during the war. When the Soviet Union collapsed in 1991, Russia's government revealed the hidden treasures. Today, there is still fierce debate over which country should have ownership over them Despite a law enacted in 1997 that stated the Russian Government should return all of the works, many of them still sit, collecting dust in the storerooms. One collection in particular, the Bremen Kunsthalle collection comprised of over a thousand drawings, over fifty paintings and thousands of prints is still very much in the spotlight. This collection was seized by Soviet troops near Berlin in 1945. Even though the collection was found in Germany, Russia still refuses to return it to its place of origin. A number of the pieces were donated to museums but Captain Viktor Baldin who advocated for their return to their original owners kept some. The History of Restitution and the trophy art of the Nazi's and Soviet Union is one of deceit and controversy, a true saga of art pirates. This historically critical collection is just one of many works and collections that are the source of the gridlock between the German and Russian Governments. The fight for whose proper the works are will seemingly never end. This collection transcends time and even decades after it was found, its still one of the most publicized controversies from the period.

6. **Authorship and Attribution: Forgery and the Power of Names**

Presenter(s): Elise Jacobsen

Advisor(s): Dr. Wendy Salmond

The Western art world has a very individualistic culture, placing a great deal of emphasis on the power of names, whether it be artists or art experts. This creates a unique environment for forgery to occur, even flourish. In my research I will investigate the phenomenon of art forgery and authentication, its effects on the professional art world and the perception of art, and the particular cultural factors, such as the emphasis on authorship and the importance of originality, that make forgery both possible and popular.

7. **Female Monstrosity: Jenny Saville's Unbounded Bodies**

Presenter(s): Grace Jones

Advisor(s): Dr. Wendy Salmond

Jenny Saville's figure paintings embody the notion of female monstrosity, a psycho-social reaction to female empowerment. In patriarchal societies throughout human history, early dichotomies of being have dictated narrow constructs of the masculine and feminine – strong vs. weak, rational vs. emotional, form vs. matter. When women are not contained by these patriarchal ideals, they – and most of all, their bodies – can provoke real feelings of disgust. While this experience of disgust is a visceral reaction, it is entirely the result of social conditioning. Saville's paintings illustrate this instinctive, abject response to a woman unbounded; their bulging bodies staunchly rejecting prescribed notions of femininity. For these women are not truly repulsive or horrific, rather they threaten the familiar safeguards of male-dominated society. Through their very bodies, Saville's women defy patriarchal control, generating a sense of unease and disgust in those who dare confront them.

8. **Rediscovering Brazil: The Marajoara Style in Modernist Art and Design**

Presenter(s): Alyson Brandes

Advisor(s): Dr. Wendy Salmond

During the Portuguese rule of Dom Pedro II until 1889, and the years of the First Brazilian Republic that followed, Brazil struggled to achieve a strong national identity that would unify the country and legitimize its rich cultural heritage. The discovery and excavation of Marajó Island in the 1870s provided evidence of an ancient civilization comparable to the Olmec or Maya, and inspired Brazilian Art Deco and later Modernist artists. Polychrome ceramic urns, vessels, and tangas (female pubic covers) were among the most abundant archaeological finds, many with zoomorphic and geometric motifs that show the cultural importance of various animals and stages of life. By understanding the cosmology and iconography of Marajoara ceramics, the ceramics, furniture, architecture and painting created from the late 1890s until the 1930s can be viewed from a perspective more in line with the original context of the ancient motifs used. The borrowing of the Marajoara style by Brazilian Art Deco artists, and the sheer multitude of artistic products made in this period, reflects an interest in native cosmology and the desire to adopt Brazil's primitive roots as part of its national identity.

Poster Presentations- Session II

Thursday, May 2 | 9:30AM-11:00AM

Sandhu Conference Center

Biochemistry and Molecular Biology

9. Biophysical Characterization of CowN from Gluconacetobacter Diazotrophicus

Presenter(s): Kevin Bretzing

Advisor(s): Dr. Cedric Owens, Michael Medina

Gluconacetobacter diazotrophicus is a nitrogen fixing bacterium that is associated with plants and plays a crucial part in providing fixed nitrogen to many crops such as sugar cane. The enzyme responsible for reducing atmospheric nitrogen to ammonia is nitrogenase. The presence of carbon monoxide gas will inhibit nitrogen fixation by nitrogenase. While nitrogenase in vitro is inhibited, diazotrophs may have a mechanism of protecting nitrogenase in vivo. It is believed that a protein contained in diazotrophs, CowN, protects the nitrogenase from the detrimental effects of carbon monoxide. The overall goal of this research is to better understand how CowN shields the nitrogenase from carbon monoxide. Particularly, we are interested in understanding the structure and biophysical properties of CowN and whether it interacts directly with nitrogenase. Here, we will describe the purification of CowN and its biophysical characterization. Following expression of the CowN gene in E. coli and purification by affinity and size exclusion chromatography, samples of CowN can be found in two different states; monomeric and oligomeric. The functional importance of the two oligomeric states and the interconversion mechanism is unknown. CowN contains a cysteine residue which can form disulfide bridges with other cysteine residues. We determined that reducing the disulfide results in greater amounts of monomer, suggesting that disulfide bond formation and oligomerization may be related. Furthermore, we found that a CowN variant that has its cysteine mutated to a serine also predominantly forms a monomer. However, oligomer still is present, suggesting oligomerization is not entirely dependent on disulfide bond oxidation. Therefore, we are exploring other factors that may cause the change in oligomeric state of CowN such as temperature, salt concentration and pH. We characterize the change in oligomeric state by using dynamic light scattering, size exclusion chromatography and circular dichroism spectroscopy. The results of these experiments will be discussed in the presentation.

10. Determining the Structure of CowN Through Protein Crystallography

Presenter(s): Estevan Harris

Advisor(s): Dr. Cedric Owens, Michael Medina

Nitrogen fixation is the conversion of dinitrogen gas to ammonia. This process is catalyzed in nature by diazotrophic bacteria, which contain the enzyme nitrogenase. Nitrogenase uses the biological energy carrier ATP and biological reducing equivalents to reduce N2 to NH3. Biological nitrogen fixation, however, can be inhibited if there is a high concentration of carbon monoxide present. Carbon monoxide (CO) is a plant signaling gas, can also be found in high concentrations in the soil, and arises from anthropogenic sources. The protein CowN allows the survival of nitrogen fixing bacteria grown in the presence of CO. Since the mechanism and structure for CowN are not known, our goal is to characterize CowN by solving its protein crystal structure using protein crystallography. CowN is expressed recombinantly in E. coli and purified by affinity and gel filtration chromatography. Next the purity of CowN is checked by SDS PAGE. Purified protein is used set up 24-well and 96-well crystal trays. So far, we have been able to purify the CowN protein in good yield, but we have not found a suitable condition for crystal growth. Crystallography experiments are therefore ongoing.

11. The Effects of Gibberellic Acid and Auxin Hormones on Heliotropism in Sunflowers

Presenter(s): Brandon Bernardo

Advisor(s): Dr. Hagop Atamian

Sunflowers are one of many different plant species that are able to track and face the sun in order to optimize the amount of sunlight they are exposed to. This process of orienting towards the sun is called Heliotropism. Sunflowers are able to effectively orient themselves towards the sun because the growth rate on the East and West side of the stem alternates depending on the time of day. At dawn, the East facing stem will grow at a faster rate than the West facing side, resulting in the flower orienting towards the West. This alternating and uneven growth is what allows the sunflower to track the sun during the day and reorient at night to face the East in preparation for sunrise. Not much is known about the biological processes that induce heliotropism. In our study, we focused on two known growth inducing hormones in plants that are present in sunflowers, Gibberellic Acid and Auxin, and their importance to heliotropism. Because of their prevalence in sunflowers and their known ability to induce growth in plants, we hypothesized that Gibberellic Acid (GA) and an Auxin hormone, Indole-3-Acetic Acid (IAA), play a significant role in sunflower's ability to perform heliotropism.

12. Fusarium Euwallacea: A Serious Threat to the Native and Ornamental Trees and Shrubs in Southern California

Presenter(s): Greg Tyler

Advisor(s): Dr. Hagop Atamian

Fusarium Euwallacea is a fungus that has established symbiotic relationship with the beetle Euwallacea aff. fornicata. The beetle bores through the tree bark and into the sapwood making long tunnels inside the trees. The beetle carries the F. Euwallacea in a specialized structure on its body called mandibular mycangia and cultivates the fungus in the tunnels on which the beetle feeds to grow and reproduce. The growth of the fungus obstructs water and mineral transport in the plant xylem tissue, resulting in dieback, wilt and mortality of the host tree. Fungi are known to secrete proteins called effectors in the plant cells to suppress plant immune responses and create a favorable environment for growth and reproduction.The beetle and the fungus attack more than 200 plant species. The dieback disease caused by this beetle-fungus complex is emerging as a serious threat to the Southern California's landscape tree species as well as agricultural crops such as avocado, citrus, and olive. The goal of this project is to computationally predict and annotate the candidate effectors secreted by F. Euwallacea. Identifying the collection of effectors secreted by this fungus will give an overall insight regarding the possible mechanisms that F. Euwallacea uses to flourish in the tunnels made by the beetle. Our results show that F. Euwallacea contains 1342 candidate effectors. Currently we are conducting comparative analysis among the related fungal species as well as gene structure analysis to assign functions to the different effectors identified in F. Euwallacea. The results from this project will be experimentally tested in the future by mutating the effectors in the fungus and assaying the propagation of the fungus in the tunnels made by the beetle. This will help us better understand the infection process which could help us device new effective strategies to combat this devastating pathogen.

13. HIV-1 Matrix Protein Interaction With Calmodulin

Presenter(s): Brian Hartman

Advisor(s): Dr. Jerry LaRue

Human immunodeficiency virus (HIV) is a retrovirus that emerged in the 20th century causing an infection that can evolve into acquired immunodeficiency syndrome (AIDS). Having infected over 40 million people globally with approximately 5 million new cases occurring each year, the immensity of this problem is clear, depicting the necessity for viable solutions. HIV attacks the human immune system, CD4 T cells being the main target, leading to decreased immune function and increased susceptibility to secondary infections. The HIV matrix protein (MA) is an essential part of the HIV life cycle, playing fundamental roles in the assembly and budding of newly formed HIV virions. HIV MA is known to interact with the protein calmodulin (CaM). CaM functions as a calcium level sensor in eukaryotic cells, transmitting signals to ion channels and many other calcium sensitive proteins. CaM contains two domains connected through a flexible α-helix which can change conformation upon interactions with other protein targets. Previous studies have shown that CaM binds to MA in a Ca2+ dependent manner, making the MA-CaM interaction the subject of great interest to antiviral researchers. The MA-CaM interaction was investigated by utilizing fluorescence spectroscopy to study the CaM binding region of the MA protein. Changes in fluorescence of the two tryptophans will reveal clues on how HIV MA interacts with CaM. Using anisotropic fluorescence, the molecular orientation and mobility of the MA-CaM interaction will be studied. Using circular dichroism, the structure and conformation of the MA-CaM interaction will be further studied. Research into the interactions that calmodulin performs serves as an important field of research, showing a potential avenue for finding a solution to the HIV epidemic.

14. Gain-of-Function P53 Mutations in Field Cancerization of Histologically Normal Prostate Tissues

Presenter(s): Emily Cauble

Advisor(s): Dr. Marco Bisoffi

The first part of this research project involved determining the frequency and level of expression of two specific gain-of-function (GOF) p53 mutations in tumor adjacent histologically normal human prostate biopsies. The second part of this research project was determining if there was a correlation between the presence of GOF p53 mutations and telomere shortening. We determined the frequency of p53 R175H and p53 R273H in histologically normal and field cancerous prostate tissues using a Mutation Detection qPCR assay. The telomere correlation was determined using a Telomere Length qPCR Assay. This project was completed using independent tissue cohorts. There is currently a lack of knowledge and understanding behind the frequency of the p53 gain-of-function mutations that occur in histologically normal and field cancerous prostate tissues. Preliminary data previously conducted showed the occurrence of p53 R175H and p53 R273H in 9 out of 11 (82%) and in 8 out of 11 (73%) of histologically normal tissues resected 1cm from the visible margin of prostatic adenocarcinomas. In addition, 70% of tumor tissues were positive for p53 R175H and 90% of the tumor tissues were positive for p53 R273H. The correlation of the presence of the GOF mutations to telomere length has not been previously studied. The analyses of these p53 gain-of-function mutations and the correlation to telomere length will pertain to both the diagnosis and prognosis of early stage prostate cancer.

15. **Measuring Methylotrophic Substrates in Peatland Pore-Waters**
    Presenter(s): Colten Pierson, Savannah Schwager
    Advisor(s): Dr. Warren De Bruyn

Methanol (CH3OH) plays a large role in atmospheric chemistry as it produces the greenhouse gas methane (CH4). While there are two dominant pathways in which methane is produced and cycled within peatland ecosystems via methanogenesis, there is also a lesser known third pathway using methylotrophic substrates such as dimethyl sulfide (DMS) and methanol. The goal of this research is to measure the contribution of methylotrophic substrates, specifically methanol, in methane production to determine the usage of this third pathway in peatland ecosystems. This information will assist in understanding the impact which methylotrophic substrates in peatland pore-waters have on the atmosphere. Measurements of methanol concentration were performed in attempt to examine the role of methanol in the methane cycling of peatland ecosystems. Gas chromatography mass spectrometry (GCMS) was used as a method to measure these concentrations. Once this was done, a standard curve was created in order to calculate the concentrations. Using GCMS, peaks were obtained and integrated at weights of certain isotopes of 31, 33, 34, 35, and 36. As the standard curve was made, these peak areas measured from GCMS were plotted against known concentrations of methanol. Further experimentation should analyze unknown concentrations of methanol and compared to the standard curve.

16. **Synthesis of ca-27 and Derivatives for Structure Activity Relationship Studies in Prostate Cancer Cell Lines**
    Presenter(s): Veronica Dang
    Advisor(s): Dr. Justin O'Neill

The natural product, curcumin, has been utilized for centuries as a dietary and herbal supplement for treatment of wounds, jaundice, and rheumatoid arthritis. Recent studies have shown that several analogues of curcumin, specifically ca-27, have also demonstrated significant activity against prostate cancer cells. To gain further insight into the relationship between the molecule's structure and it's anti-cancer activities, efforts were made to synthesize ca-27 and several of its derivatives. Synthesis methods involved various organic chemistry reactions, including aldol condensation, catalytic hydrogenation, cleavage, and ketone reduction. Four compounds were synthesized to be used in further studies to examine structure activity relationship (SAR) for ca-27 against prostate cancer cells.

Biological Sciences

17. **Slime Skein Scaling in Pacific Hagfish (Eptatretus Stoutii)**
    Presenter(s): Skylar Petrichko
    Advisor(s): Dr. Douglas Fudge, Tim Winegard

Hagfish are ancient, bottom-dwelling creatures that are commonly known for their defensive slime. These proteinaceous slime thread cells coil into an organized structure called a skein. While the composition and production of skeins have been studied, its scale to body size within and across hagfish species has not been investigated. Skein scaling is a monumental concept in order to comprehend the evolutionary

mechanism that has accommodated for a diverse range of hagfish sizes. Furthermore, the cellular process of body size adjustment has been researched but not fully understood. Despite the notion that somatic cells are invariant intra and interspecies, studies have shown a relationship between red blood cell size and body size. Specifically, one study revealed that erythrocytes scaled to the body size of geckos (Starostova et al., 2005), while another study was able to identify different species based on the various dimensions of erythrocytes (Adili et al., 2016). In this study, slime exudate from Pacific hagfish (Eptatretus stoutii) was collected to measure the length, width and thread diameter of several skeins. In addition, exudate from Purple hagfish (Eptatretus okinoseanus) was also examined. Slime thread cells from these species were analyzed in hopes to further understand cellular mechanisms in various body sizes and species.

18. **The Mechanism of Skein Unraveling in Pacific Hagfish**

Presenter(s): Aly Dwight
Advisor(s): Dr. Douglas Fudge, Dr. Gaurav Jain

Hagfish are deep-water fish that are known for their ability to produce substantial amounts of slime when provoked. The slime is composed of mucin vesicles and skeins. The skeins are essentially balls of thread that unravel to allow for intact slime formation. My project focused on understanding the slime formation through skein unraveling. I hypothesize that skeins require an anchor point for fast and full unravelling to take place. I tested this hypothesis by collecting fresh exudate and exposing it to artificial sea water (ASW) with no anchor points as well as ball bearings acting as anchor points. Full unraveling of the skeins with no anchor points in the apparatus would disprove my hypothesis, whereas finding that anchor points facilitate skein unravelling would support it. Preliminary results show that most of the skeins do not fully unravel with or without the presence of ball bearings and mucus appears to surround the partially unraveled skeins. This shifts the question to whether or not skeins fully unravel when slime forms and that mucus formation precedes the unraveling of skeins. Understanding the kinetics of how skeins unravel, and mucous vesicles burst to form mucus strands will advance the progress of slime-mimetic applications in future.

19. **High Concentrations of Trimethylamines in Hagfish Slime Glands Inhibit Skein Unraveling in Pacific Hagfish**

Presenter(s): Marie Starksen, Kashika Singh
Advisor(s): Dr. Douglas Fudge, Dr. Gaurav Jain

Hagfish defend themselves by releasing large volumes of gill-clogging slime. The slime consists of two major components: mucous and thread. The threads are produced within specialized cells and packaged into intricately coiled bundles called skeins. Thread skeins are kept from unraveling via a seawater soluble protein adhesive that dissolves when the skeins are ejected from the slime glands. Previous analyses in Atlantic hagfish revealed that the slime gland has a high concentration of methylamines including TMAO, betaine, glycine, and dimethylglycine. We hypothesized that the methylamines have stabilizing effects that inhibit skein unraveling. We investigated skeins of the Pacific hagfish to estimate the amount of unraveling in the presence of these stabilizing components. As predicted by the hypothesis, unraveling can be inhibited by TMAO and betaine invitro under conditions in which unraveling normally occurs. Furthermore, TMAO alone is a more effective inhibitor of unraveling than betaine alone, but the presence

of TMAO synergistically boosts the inhibitory action of betaine. Glycine and dimethyl glycine were not effective inhibitors of unraveling. Our results indicate that these trimethylamine compounds act to stabilize the seawater-soluble glue that holds the coiled thread skeins together within gland thread cells which dissolves away upon mixing. These results advance our knowledge of how skeins are kept from unraveling within the slime gland and the crucial role the glue plays in the defense of hagfish from the predators.

20. **Hagfish Epidermal Cells**

Presenter(s): Kristen Nieders

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

Hagfish slime functions 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. It is hypothesized that hagfish slime glands arose as a result of the invagination of cells found in the epidermis, namely epidermal thread cells (ETC) and large mucus cells (LMC). This hypothesis predicts that there should be similarities between the structure of the thread and mucous cells found in the skin and those found in the slime glands. Here, we categorize the different types of cells found in the epidermal layer of hagfish skin: ETC, LMC, and small mucus cells (SMC) and aimed to gain a better understanding of the distribution and characteristics of these cell types. We sampled the distribution of these three cells from digitally reconstructed sections from different longitudinal positions of the hagfish. For the midsection, despite relatively consistent densities of ETC and SMC, a heterogeneous distribution along the girth was found in LMC. A different composition of cell types was found near the tail, with a potentially undocumented cell type. Our result suggests a concentration of LMC near the midsection and a variation in epidermal cell types from middle of the body to tail. This research provides insight to the diversity of cell types found in hagfish skin as well as the evolutionary origins of the highly specialized cells found within hagfish slime glands.

21. **The Locomotion of Atlantic Hagfish Burrowing in Marine Mud Sediment**

Presenter(s): Keolani Kahale-Lua

Advisor(s): Dr. Douglas Fudge, Dr. Charlene McCord

Hagfishes are elongate craniates that live on the ocean floor and burrow into carcasses. Though effectively blind, hagfishes are able to manipulate their bodies to efficiently navigate through complex environments and confined spaces. However, there is little known about the specificity by which hagfishes utilize certain locomotor behaviors. The purpose of this study was to identify the strategies that Atlantic hagfish (Myxine glutinosa) use to navigate through marine mud sediments, a preferred burrowing substrate present in their natural environment. We conducted kinematic analyses of videos of the Atlantic hagfish burrowing into a tank of gelatin, a transparent analog for mud. We observed and quantified the mechanisms that hagfish used to enter the substrate and how individuals were able to progress through it once submerged. We found that hagfish used a biphasic burrowing mechanism to enter the gelatin: by positioning their bodies at an acute angle, coupled with a high tailbeat frequency, the hagfish fractured the gelatin's surface and began their burrowing. The second phase of burrowing featured a decrease in tail-generated thrust, and was consistent with a "sliding" gait to achieve complete burial into the substrate. Our results suggest that Atlantic hagfish display forms of locomotion that are extremely well-adapted for their specific environment and that their

narrow heads serve as an exceptional tool for burrowing. Our work sheds light on the evolution and biomechanics of locomotion in long-bodied aquatic animals. Other research in the lab addresses hagfish burrowing in alternative substrates; a comparative analysis of the studies' results will provide insight into whether the observed burrowing behaviors are species or substrate-specific.

22. Neuroendocrine Correlates of Parental Care in Coturnix Japonica

Presenter(s): Faith Holloway, Edena Khoshaba

Advisor(s): Dr. Patricia Lopes, Dr. Robert de Bruijn

In most species, including humans, parental behavior is critical for infant survival. While we have good explanations for the "why" portion of parental care, we still don't know the "how": what in the brain changes that brings about parental behaviors? In order to learn more about the specific gene expression patterns associated with parental behavior we studied a domesticated species that has mostly lost the expression of spontaneous parental care - the Japanese quail. When presented with young chicks, adult Japanese quail will often ignore the chicks or may be afraid and show aggressive behaviors towards them. We used a previously described induction procedure to bring back parental behaviors to these birds, consisting of housing an adult with two young chicks overnight. We subjected both males and females to this procedure and tested their reaction to novel chicks in the morning. Following the behavioral tests, the brains and blood of each adult quail were collected, processed, and frozen at -80 °C. The hypothalamus (H), bed nucleus of the stria terminalis (nST), and nucleus taeniae (Tn) were extracted from each brain and preserved in QIAzol. Total RNA was isolated from the relevant brain regions for each test animal, and reverse transcription was used to produce cDNA for genes of interest. Real-time polymerase chain reaction was used to quantify differences in gene expression of arginine vasotocin and gonadotropin-inhibiting hormone between parental and nonparental groups. The induction procedure worked in about 70% of the cases, with birds showing parental behaviors (e.g., sitting on the chicks) and reduced aggression the morning after induction. About 25% of the control birds showed some spontaneous parental care, albeit to a smaller degree than the induced birds. We will discuss the gene expression results in the light of what is known about those genes.

23. Analyzing Gene Expression Through the Use of RNA Extraction to Determine the Neural Mechanisms Involved in Regulating Sociality Amongst Wild Mice

Presenter(s): Chandler Siemonsma, Sachin Patel

Advisor(s): Dr. Patricia Lopes

Variation in social behaviors impacts the overall fitness of an organism. A deeper understanding of the underlying neural mechanisms regulating social behaviors within organisms such as mice can help us develop improved diagnosis and treatment of social disorders in humans. This study was conducted to determine how gene expression varies amongst social and non-social wild mice residing in Zurich, Switzerland. Behavioral analysis was made possible in a natural environment through the use of remote technology involving antenna signals developed by Dr. Patricia Lopes and team. Mice were grouped together based on differentiating sociability, with similarities in age and sex. Brain samples were collected from these groups. Specific regions of the brain were then extracted using a cryostat and micropunches. The brain regions of interest were the following: hypothalamus, hippocampus, and bST. It is known that these specific regions of the brain are

associated with social behaviors. RNA extraction was conducted on the various brain samples that were prepared. RNA was subsequently submitted to RNAsequencing. This methodology allows for a comparison of the entire transcriptome of these brain regions between the two groups of mice. The results showed that a dopaminergic pathway appears to be involved in regulating the differences between mice at the extremes of the sociability scale. We will discuss these results further in light of the known functions of dopamine.

24. The Influence of the Apolipoprotein E4 allele (APOE4) on Blood Brain Barrier (BBB) Integrity and Risk of Alzheimer's Disease

Presenter(s): Catherine Domingo

Advisor(s): Dr. Elaine Schwartz, Dr. Jennifer Funk

Alzheimer's disease (AD) is the most common form of age-related dementia. Genome-wide association studies have identified that the most significant factor that increases risk of AD is the apolipoprotein E4 allele (APOE4), which encodes for apolipoprotein E (APOE). The reason that APOE4 increases the risk of AD is not fully understood, but may involve the increased production, aggregation, and/or impaired clearance of β-amyloid. Overall, this study aimed to provide more insight into how APOE4 might affect blood-brain barrier (BBB) integrity to increase AD risk. The BBB is involved in the clearance of β-amyloid, and helps regulate the brain microenvironment and neuronal signaling. The BBB is composed of brain microvascular endothelial cells (BMECs), which are characterized by their strong tight junctions that allow these cells to form a monolayer that restricts the flow of foreign substances into the brain. In this study, BMECs were experimentally derived from induced pluripotent stem cells (iPSCs), which are formed from adult skin cells that have been reprogrammed back to their embryonic-like stem cell stage through genetic manipulation. BMEC cell lines were established from an APOE 33 healthy control and an APOE 44 AD patient. iPSC cell lines were generated through CRISPR-Cas9 gene editing technology to develop isogenic iPSCs in which the genotypes were converted from APOE 33 to APOE 44 and vice versa. Electrical resistance measurements were taken across the generated BMEC monolayers to assess BBB permeability in 24-hour intervals over the course of 120 hours. Results from this study suggest that regardless of the original genotype of the patient and whether or not the patient has AD, cell lines with an APOE 44 genotype exhibited lower electrical resistance values relative to cell lines with an APOE 33 genotype. Low electrical resistance values were linked to increased BBB permeability and BMEC degradation, rendering a breach in the BBB and increased susceptibility of β-amyloid plaque buildup in the brain.

25. Parapodial Spreading as an Antipredator Response

Presenter(s): Collette Haddadin

Advisor(s): Dr. William Wright

In this experiment, I empirically studied the sea hare Aplysia californica, to examine the behavior in artificial seawater (ASW) vs predator water. A spiny lobster, Panulirus interruptus, was the predator used in this experiment. We tested for evidence of an anti-predator response in Aplysia. I placed the sea hares into two bins containing either artificial sea water or predator water. I measured the longest distance between their left and right parapodia throughout a ten minute interval. I hypothesized that water used from the tank containing the lobster would cause a greater spread of parapodia flaps. This could possibly be an antipredator response to the chemical cues sensed by the Aplysia. After data was obtained and statistical analysis was performed, it

was found that Aplysia in predator water opened their parapodia much wider than the Aplysia in artificial seawater. The average width across seventeen minutes for animals in ASW was found to be 3.72mm. The average width across seventeen minutes for animals in predator water was found to be 7.09mm. This behavior helps increase survival of the animal by possibly acting as an escape behavior, camouflaging the animal, or intensifying the release of ink and oplin from the siphon. Further experimentation needs to be performed in order to determine why this behavior occurs, which provides a basis for future neuroethological research.

Chemistry

26. Investigating the Effects of Goethite Nanoparticle Aggregation via Freezing on Zn(II) Ion Absorption and Retention

Presenter(s): Tim Le
Advisor(s): Dr. Christopher Kim

Mining in California has the potential to contaminate bodies of water with dissolved metals including zinc, which threatens natural resources and ecosystems. Iron oxyhydroxide (goethite) nanoparticles (NP) possess the capacity to adsorb and retain dissolved metal(loid) ions onto them and offer a way to remediate aqueous environments that have contaminated with zinc. Additionally, the aggregation state of goethite NPs has been known to affect its Zn(II) adsorption and retention. The effect of aggregation via freezing in a cold room on Zn(II) adsorption and retention was investigated. Goethite NPs were synthesized and placed in a -20°C cold room at for 0, 240, 300, and 360 minutes. The aggregate diameter of the goethite NPs was analyzed with Dynamic Light Scattering (DLS). Zn(II) ions were adsorbed and desorbed to the goethite NP aggregates. The concentration of Zn(II) was analyzed in the adsorbed and desorbed NPs via Inductively Coupled Plasma-Optical Emission Spectrometry (ICP-OES). Extended X-ray absorption fine structure (EXAFS) spectroscopy at the Stanford Synchrotron Radiation Lightsource (SSRL) was used to analyze the environment around the Zn(II) ions within the NP aggregate. Goethite NP aggregate diameter increases rapidly after 240 minutes in the cold room. As the NPs aggregate via freezing, the Zn(II) ion adsorption and desorption should increase, but then plateau at the aggregation size that correlates to 240 minutes in the cold room, because aggregation should cause the NPs to become more dense and squeeze together and the NP surface area and pore size should decrease. When there are smaller pores, less Zn(II) ions will be able to fit in; when there is less surface area, less Zn(II) ions will find surfaces to bind to. Developing the knowledge of the effects of aggregation via freezing on zinc adsorption/desorption will help better inform and warn communities living near cold-climate zones near zinc-contaminated water.

27. Stereospecific Synthesis of Cyclopropanes

Presenter(s): Daniel Chang
Advisor(s): Dr. Elizabeth Jarvo, Dr. Justin O'Neill, Nadia Ilchenko

The cyclopropyl fragment appears in a variety of natural products that have broad applications including use as antifungal agents, insecticides, and medicinal agents. The cyclopropyl fragment is also useful as a synthetic intermediate due to its ability to participate in metal-catalyzed rearrangements and cycloaddition reactions, which allows chemists to access a broad library of chemical structures. We are

using a nickel-catalyzed intramolecular cross-electrophile coupling reaction for the synthesis of cyclopropanes. This reaction is stereospecific, allowing the selective synthesis of a precise 3-D shaped molecule, called a stereoisomer. The stereospecificity of reactions is crucial because two different stereoisomers of a molecule may behave in completely different ways. In biologically active molecules, like pharmaceutical drugs, one stereoisomer may have a beneficial effect, while the other could have no effect or a negative effect. Synthesizing molecules that are selectively shaped is extremely challenging and is the reason why there are limited stereospecific methods. By using a stereospecific reaction, the compound with desired effects can be selectively synthesized. Furthermore, cross-coupling reactions typically involve preparation of a metal nucleophile (organometallic molecule) which is coupled with an alkyl or aryl halide. Preparation of a metal nucleophile introduces additional safety precautions, extra steps, and allows for less functional group compatibility than alkyl halides and pseudohalides. Our reaction is a cross-coupling between alkyl electrophiles, which eliminates the need of a metal nucleophile. Our nickel-catalyzed cross-couplings were used for the stereospecific synthesis of cyclopropanes from oxetanes in 5 examples with up to 85% yield.

28. **Methylamine Concentrations in Peatland Porewaters**
    Presenter(s): Katherine Ishimine, Daniel Chang
    Advisor(s): Dr. Warren De Bruyn

Peatland ecosystems store large quantities of carbon in their soils and are a significant source of methane to the atmosphere. Methane production in peatlands is believed to proceed primarily via either an acetoclastic pathway or a hydrogenotrophic pathway. It has been suggested that a methylotrophic pathway, in which methanogens produce methane from methylated substrates, is also viable. As part of an effort to test the significance of this pathway, methods were developed to measure the potential substrates or methylamines at the nanomolar level in peatland porewaters. A solid-phase microextraction gas chromatography-mass spectrometry method (SPME-GC/MS) was developed to measure mono, di, and tri methylamine. In all cases, detection limits were at the low nanomolar level. To validate the methods, substrate concentrations were measured in porewaters from a number of peatland sites across a range of depths. The average mono, di, and tri methylamine concentrations were 368±183, 30±42, and 24±10 nM respectively. Methods and some preliminary data will be discussed.

Communication Studies

29. **Social Media's Effect on Self-Image and Body-Image**
    Presenter(s): Sierra Oberacker, Emilee Monnig, Samory Bailey, Jessie Stauber
    Advisor(s): Dr. Austin Lee

We live in a world today that is constantly surrounded by technology. We use it every day to make our lives easier, to speed up time, to connect with others from a distance, and much more. In many ways, technology makes our lives easier, some would say better, but in a world that relies heavily on it, we also see some challenges. One of these challenges includes the changing self image and body-image of our society's young adults. Based on several separate articles we've researched, there seems to be an overall negative correlation between media usage and self image. In one of these articles, Instagram was shown to have a statistically

significant effect on body image, specifically a negative influence. We believe the research will show that the more social media young adults in college use, the more negatively influenced their self-image and body-image will be As stated above, the purpose of this study is to examine the role of social media on individuals' self-image and body-image. We spend countless hours scrolling through our feed, discussing posts with our friends, and looking at images of both close friends and influencers around the world. Social media has become a staple in our young adult culture, therefore, influencing not only how we choose to live our own lives, but how we view ourselves based on comparing and contrasting ourselves to the lives we see on social media. Through our research, we want to look further into how the role of social media in our everyday lives may negatively impact our self-image and body-image. We will ask young male and female adults how they have seen the role of social media impact their personal identity and has influenced their self-image and body-image throughout its usage.

30. **The Effects of Racial Diversity in Brand Advertising**
    Presenter(s): Rachel Yuter, Sara Crossman, Liza Wong, Kyler Hannah
    Advisor(s): Dr. Austin Lee

This current study begins to examine the relationship between a brand's use of racial diversity and its audience's reactions. While commercials have a history of focusing on the majority, brands are now taking advantage of inclusive advertisements, realizing they are more effective than exclusive advertisements. The increasing amount of diverse advertisements has allowed brands to reach a wide range of audiences, appeal to new markets, and create a stronger image for their brand. Based on previous research and literature, it is hypothesized that there is a positive correlation between a brand's use of racial diversity and their target audience's attitudes and behaviors. In order to test our hypothesis, we plan on analyzing the results from a controlled experiment in which either an inclusive (including multiple races) or exclusive advertisement (including solely caucasian actors and actresses) will be shown to participants. Our experimental study will measure both our independent and dependent variable, measuring participants' attitudes toward the brand and purchase intention after viewing either an exclusive or inclusive advertisement. From there, we will analyze the advertisements' use of diversity in relation to the consumer's reaction. The findings will suggest whether or not advertisements involving diversity results in a more positive association with the advertisement and whether or not the audience is more inclined to buy the specific product that the advertisement is selling.

31. **The Effects of Gender on Consumer Attitude and Purchase Intention for Sport Products**
    Presenter(s): Ben Rhein, Lindsey Johnson, Mike Molina
    Advisor(s): Dr. Austin Lee

Celebrity images are featured in all types of advertising including print, radio, digital and approximately 20% of all television commercials (Lane and Spiegel, 1996). They are featured in so much advertising for good reason. Products that are endorsed by celebrities, especially athletes, tend to receive a more positive attitude from consumers (Petty, Cacioppo & Schuman, 1983). Why is this? Is it because consumers find the product or brand all of a sudden more credible or reliable? Is it because they just identify with the athlete, the sport and want to buy whatever they use? We believe this is something that is important to understand because by understanding what about a sport advertisement with an endorser makes someone want to buy the product

or have a good feeling or attitude toward a brand, we will better understand the consumer. This will make advertising better and more targeted to the consumer. This study researches the effects of the gender of a product endorser and the gender of the consumer on the consumer's opinions of credibility, attitudes and purchase intention towards sport products. The gender of an athlete that is endorsing a product can change the way a consumer feels about the product. It can change their attitude towards the brand, their intent to purchase and how credible they feel the brand is. The type of product also comes into play for the consumer in their decision-making process. Though there are very few studies on this it is hypothesized that consumers who are the same gender as the product endorser are more likely to find the brand credible, have a good attitude towards the product and purchase the product.

32. The Influence of Backdrop Color on Speaker Credibility

Presenter(s): Dylan Wen, Kayla Slack, Lisa Matsui
Advisor(s): Dr. Austin Lee

Color serves as a important and powerful communication tool, and heavily influences people's motivation, performance, and perceptions, largely due to people's learned associations to color. This study examined how different colored backgrounds influence the perceived credibility of a speaker. A total of 75 participants completed an anonymous online experiment. Participants watched a one-minute video clip promoting a student organization. The video clips were identical across the conditions, with the exception of the background behind the speaker varied in three colors: red, blue, and white. Using a between-subject design, participants were randomly assigned to one of those conditions. Participants then evaluated the perceived credibility of the speaker in the three primary dimensions (expertise, trustworthiness, goodwill) and the three secondary dimensions (dynamism, composure, sociability), using a 36-item semantic differential scale. The results indicated that the background color significantly influences the perceived trustworthiness of the speaker. A post-hoc analysis revealed that the blue background increases the speaker's perceived trustworthiness, while the red background decreases it. The white background was not significantly different from the blue and red backgrounds. The background color did not influence the other dimensions of source credibility. While there were study limitations such as a limited sample size, method of delivery, and topic of the speech, blue still had a noteworthy impact on the audience's perception of trustworthiness toward the speaker. For effective persuasion, speakers and presenters are recommended to utilize a background with cooler colors.

33. Influence of Gender Stereotypes in Consumer Advertisements

Presenter(s): Alexis Wright, Jacqueline Simon, Kaitlin Wong, Remi Beno
Advisor(s): Dr. Austin Lee

This study is aimed to examine gender stereotypes in advertisements and if these stereotypes influence the consumers end decision to purchase the product. Research showed that advertisers have come a long way in representing stereotypical male and female gender roles. Historically, advertisements have represented men as the "breadwinners" and leaders of the household, leaving women to be seen as the "homemakers." Stereotypes are still very prevalent and seen in many advertisements today. As society is starting to view gender roles differently, advertisers have found it difficult to move away from their traditional, stereotypical approach. A survey was created showing two different commercials, one

showing stereotypes toward men, the other showing stereotypes towards women. The main goal was to examine if participants identified the stereotypes, and if they would still purchase the product. A study found by Doyle, has found five basic norms that males are perceived in the media. Which consist of the following: "The anti-feminine element, the success element, the aggressive element, the sexual element, and the self-reliant element" (Chi & Baldwin, 2004). Through these elements, men are typically stereotyped as the "breadwinners" and the ultimate hero who provides for the family. Masculinity is another tool that advertisers like to emphasize when trying to appeal to the male consumer. As it pertains to the decision making process, because advertisers place a more positive stereotype on men, it is worth considering and concluding that men will still be inclined to purchase the product and not have a negative view on the company. Advertisers also use a women's sex appeal to minimize their intelligence. For example, in a Wonderbra advertisement, "A young woman wearing only a black, cleavage enhancing bra situated between the breasts is the following slogan: 'I can't cook who cares?'" (Pongratz, 2003). In today's society, even with the feminist movement, not enough in the advertising world is being done to portray women in a better and more accurate light.

Computational Science

34. Communication Shortcomings Amongst Deaf-Blind Individuals and Potential Solutions

Presenter(s): Alexander Hamel, Stefani Guzman, Luke Berger, Brandon Fabre, Kiara Cardona, Karolina Michalewska
Advisor(s): Dr. LouAnne Boyd

Disabilities tend to go unnoticed within society but have serious implications in people's everyday lives. This is relevant now more than ever as technologies grow and adapt to fit the needs of almost any situation, however gaps still exist. This is most apparent with members of the deaf-blind community which has few devices capable of helping in their lives. The technologies that are there are incredibly important for communicating with others but the range of ways to do so is limited. By looking at the options available to them new devices can be made to help offset this. Braille is a primary focus of the deaf-blind community as devices tend to focus solely on it, but finger-spelling can offer an alternative. Utilizing finger-spelling, new devices could be constructed to help members of the deaf-blind community communicate and interact with others. Through conduction of contextual inquiries, we can learn from those who are reliant on current technologies and create new devices to improve areas where they continue to struggle. In our inquiry of the IS&T department of Chapman University, we learn about the accessibility needs of some of the employees. Our device combines the opportunities of both integration and growth within the community. Braille is already uncommon amongst blind individuals and technology is continuously adapting to where we must continue to build and improve upon our own society. Using a simple children's toy, the pin art 3D modeler, we can adapt to the specific needs of the deaf and blind community, and make communication as easy as the movement of the hand. This technology effectively decreases the time it takes to finish and complete work tasks, while also giving deaf-blind individuals an easier way to be social figures in our ever so adapting and vivacious environment.

35. HCI Smash Bros. iOS App

Presenter(s): Robert Kain, Austin Hong

Advisor(s): Dr. LouAnne Boyd

The purpose of this project is to build an application for smartphones that allows gamers in Chapman University to gather together to play a specific video game. The video game, for this project, is Super Smash Bros. Melee which can only be played on a CRT television. The goal of this project is to make the application as simple as possible for users to use as well as making it multi modal, including a voice activation feature. The application will be built for iOS with features such as phone, text, and map. This will allow users to connect and find one another easier than a typical Facebook or SmashBoards group. Furthermore, the application will include a discussion board that will allow other players to incorporate their ideas based on matchups and top players. Users can provide advice as well as their own combo video if they prefer to do so. We will learn important IOS application skills to make this application as simple and user friendly as possible. Our vision is to gather as many Super Smash Bros. Melee players in the Chapman Community. This will be a very niche market and non profit, but its main purpose is specific to the Chapman community. We have been involved in the "Melee" community for four years at Chapman and have hosted tournaments in the past to gather students.

36. Braille Reader

Presenter(s): Kiara Cardona, Luke Berger, Brandon Fabre, Stefani Guzman Aguado, Alex Hamel, Karolina Michalewska

Advisor(s): Dr. LouAnne Boyd

Disabilities tend to go unnoticed within society but have serious implications in people's everyday lives. This is relevant now more than ever as technologies grow and adapt to fit the needs of almost any situation, however gaps still exist. This is most apparent with members of the deaf-blind community which has few devices capable of helping in their lives. The technologies that are there are incredibly important for communicating with others but the range of ways to do so is limited. By looking at the options available to them new devices can be made to help offset this. Braille is a primary focus of the deaf-blind community as devices tend to focus solely on it, but fingerspelling can offer an alternative. Utilizing fingerspelling, new devices could be constructed to help members of the deaf-blind community communicate and interact with others. Through conduction of contextual inquiries, we can learn from those who are reliant on current technologies and create new devices to improve areas where they continue to struggle. In our inquiry of the IS&T department of Chapman University, we learn about the accessibility needs of some of the employees. Our device combines the opportunities of both integration and growth within the community. Braille is already uncommon amongst blind individuals and technology is continuously adapting to where we must continue to build and improve upon our own society. Using a simple childrens toy, the pin art 3d modeler, we can adapt to the specific needs of the deaf and blind community, and make communication as easy as the movement of the hand. This technology effectively decreases the time it takes to finish and complete work tasks, while also giving deaf-blind individuals an easier way to be social figures in our ever so adapting and vivacious environment. Computer Supported Work Cooperative (CSCW) is a growing field which evaluates the use of technology in coordinating work among individuals within the workplace. Through the use of contextual inquiries, it is possible to evaluate interaction among coworkers.

37. Using Technology to Encourage Group Productivity

Presenter(s): Irene Liu, Brady Hoskins

Advisor(s): Dr. Michael Fahy

This project aims to provide a streamlined and modular productivity tracker with an emphasis on collaboration and accountability between team members. The tracker is modeled after a typical to-do list, which contains a series of tasks and their status- eg. updates, notes, approval status, time logged, and user assignment. The tracker's functionality is then extended to support multiple users within a client-server model. In this case, a server will manage a single persistent task board while clients can connect to the server and interact with the task objects contained within the board. The networking concept of multi-casting is central to this project- we want to ensure that users receive immediate feedback on any changes pushed to the board. Users will also be able to receive live notifications for events that require their interaction. In addition to its networking capabilities, the application should be able to generate basic reports that allow for some rudimentary analytics. Ideally, each task should take anywhere between 10 minutes to an hour to complete so as to encourage frequent updates (resulting in more data) but without excessive micromanagement. Upon completion, we hope to have accomplished the following: 1) explored the effectiveness of multi-casting and client-server applications on individual and group productivity, 2) leveraged a modular and object-oriented design principle to support scalability and integration with other apps such as Github project management and issue tracking, and 3) encouraged productivity from those who benefit from smaller and shorter tasks or who prefer quick feedback from work.

English

38. The Realities of Legislation: Sex Education in California and Georgia

Presenter(s): Maile Resta

Advisor(s): Dr. Justine K. Van Meter, Dr. Jan Osborn

Sex education remains a controversial topic in the United States, a focal point in the polarizing discussions around abortion and human sexuality in this country. This study is a discourse analysis of current sex education legislation in two states: California and Georgia. The states were selected as representing diverse geographical and political constituencies as well as the researcher's background. Drawing upon Kenneth Burke's theory—Language as Symbolic Action—and using, specifically, Burke's concept of terministic screen, the analysis reveals a distinct tone and purpose of sex education in the two states.

Environmental Science and Policy

39. Sociodemographic Disparities in Sustainable Transport: Examining Equity in Regional Bikeability

Presenter(s): Jenny Gritton

Advisor(s): Dr. Georgiana Bostean

It is increasingly evident that active modes of transportation such as biking have extensive personal and social benefits. The extent to which neighborhoods are bikeable is influenced by the built environment, which varies by area sociodemographic makeup, creating disparities in access to active transportation. However, the spatial variability of such disparities has been widely overlooked in the literature. This study uses a spatial model to examine variation of possible disparities in census tract bikeability in Orange County, California. We created an index of bikeability using Geographic Information System (GIS) methods and data on bike route density, route separation from streets, connectivity, topography, and density of common destinations. Using a Geographically Weighted Regression (GWR), we created a model to predict census tract bikeability using sociodemographic indicators including race/ethnicity, income, unemployment, linguistic isolation, housing burden, and educational attainment. There was an association between census tract sociodemographic makeup and bikeability, but the directionality of this association varied throughout the county. These findings indicate that sociodemographic factors should be taken into account in land use planning for active transportation, and that spatial models such as GWR are important in capturing the nature of such interactions.

40. Tracking Transportation Sustainability Metrics in Film Productions

Presenter(s): Jenny Gritton, Stephanie Liaudat

Advisor(s): Mackenzie Crigger

Producer's Guild of America Green and its production partners strive to be leaders and innovators in developing tracking and assessment tools that aid the whole industry in understanding what sustainable choices mean for the stakeholders, the planet, and a company’s bottom line. ENV 498 is working to enhance the current PGA Green sustainability tracking tool to include financial information and capture data points that are currently not included in the environmental footprint. This particular section of the tool development focuses on any transportation involved in production, including on-site transport, private transport between sites, and public and commercial travel. By tracking straightforward metrics such as miles traveled, vehicle type mileage, and fuel type, the tool will have the capability to calculate the output greenhouse gas emissions both by sector and overall. Results will be communicated in both industry terms (e.g. metric tons of carbon dioxide) and understandable equivalencies such as trees planted or personal car trips taken. It is proposed that users of the tool use these results to establish specific emissions benchmarks for further progress, develop employee initiatives for improvement by sector, and communicate successes to the public.

41. Environmental Science and Policy Capstone: Waste & Procurement Templates for Sony Pictures Entertainment

Presenter(s): Anna Bergland, Kaitlyn Bishop, Kelsey Albarian, Jesse Galvez

Advisor(s): Mackenzie Crigger

Producers Guild of America Green and its production partners strive to be leaders and innovators in developing tracking and assessment tools that aid the whole industry in understanding what sustainable choices mean for the stakeholders, the planet, and a company's bottom line. ENV 498 is working to enhance the current PGA Green sustainability tracking tool to include financial information and capture data points that are currently not included in the environmental footprint. We have designed a template that is not only easy to track waste and procurement but easy to access from all employees. In doing this we are hoping for Sony Pictures Entertainment to better track their environmental footprint and further encourage them to reach their "Road to Zero" goal of obtaining a zero emission/waste by the year 2050 and their midterm targets by the year 2020. As soon as employees come into work they will be able to punch in their waste created from the previous day into the program as well as be able to share concerns in texts or pictures to show other employees. This is to share the word of ideas/concerns their colleagues have in order to create an environmental community within Sony. Employees can not only track and view their waste as individuals but can view as far as Sony Corporate. The waste types tracked are Waste to Landfill, Construction Material to Landfill, Mixed Recycling, Toxic/Hazardous Waste, Other Recycled and Composted, Food Waste, E-waste, and Textile Waste. In terms of procurement we are using the template to elucidate to Sony Pictures Entertainment the benefits of using eco-friendly/sustainable makeup, sustainable creation and removal of costumes, while also having the company makes sure that they are using LEAD certified hotels and hotels in cities that are the most eco-friendly; while also making sure the set design they use is the most sustainable and eco-friendly that it could be.The overarching program will dive into other areas of focus that the company is looking at and benefit not only Sony but the health of this planet.

42. Producers Guild of America Green Sustainability Tracking Tool Proposal: Energy and Water Consumption

Presenter(s): Justin Cooper, Vander Ferrer-Le, Karina Rodriguez, Fernando Silva

Advisor(s): Mackenzie Crigger

Producer's Guild of America Green and its production partners strive to be leaders and innovators in developing tracking and assessment tools that aid the whole industry in understanding what sustainable choices mean for the stakeholders, the planet, and a company's bottom line. ENV 498 is working to enhance the current PGA Green sustainability tracking tool to include financial information and capture data points that are currently not included in the environmental footprint. Our section of the tool will focus on Energy and Water Consumption. Using their own consumption data, each production's clients will be able to track their environmental impact in a way that is understandable to the common individual. They will also be able to explore environmental alternatives and their financial feasibility for each production. Energy consumption alternatives will be focused on alternative lighting, more mindful consumption, off-site film productions, and environmentally friendly generated power sources. Water consumption alternatives will be focused on water conserving irrigation, sinks, toilets, and trailers. With new alternatives to current operations, film producers can be empowered by the tool to change their environmental impact while saving money.

43. Tracking Education and Outreach Efforts at Sony Pictures

Presenter(s): Gigi Vujovich, Kiana Smith

Advisor(s): Mackenzie Crigger

Producer's Guild of America Green and its production partners strive to be leaders and innovators in developing tracking and assessment tools that aid the whole industry in understanding what sustainable choices mean for the stakeholders, the planet, and a company's bottom line. ENV 498 is working to enhance the current PGA Green sustainability tracking tool to include financial information and capture data points that are currently not included in the environmental footprint. We find that Sony has a dedication and willful obligation to environmental outreach and education, both to the general public and within the company as a whole. While they have already implemented ecologically friendly outreach into their business model and productions, it is necessary to continue working towards innovative, achievable, and quantifiable actions. With the tools to create outreach that will educate people in a lasting way, start initiatives that are robust and long-lasting, and quantify the personal investment in environmentalism, real culture change is possible. Our project will help keep Sony Pictures on track to reach its 2050 goal, strengthen its reputation as a sustainable leader in the film industry, and empower millions of viewers, employees, and community members to do good for their planet. We will produce a tool that will allow Sony to track the effects of their outreach and understand what types of educational materials function best for their consumers, employees, and the general public. We will offer survey and outreach options that are the best practices to solidify the triple bottom line.

Food Science

44. Nutritional Perspectives on Infant Milk Formula: Current Insights

Presenter(s): Claire Chou

Advisor(s): Dr. John Miklavcic

Mother's milk provides optimal infant nutrition for developing babies. However, there are situations in which breastfeeding is not the most viable option due to factors such as maternal illness, low breast milk supply, storage complications, and time constraints. As a result, modern infant formula has become a substitute or alternative when breastfeeding is not possible or is inadequate for infants. In order to design proper formula, many factors must come into play to ensure that infant formula products are as safe, as efficient, and as nutritious as breast milk. As a result, breast milk composition serves as a guide when infant formula contents are modified to closely match breast milk. The purpose of this research project is to conduct a literature review and synopsis of recent advances in infant formula to focus on what is different or missing in commercially available formulas and which health outcomes are important to assess in consideration of improving infant formula. Nutritional value has been improved by adding functional ingredients such as essential omega 3 and 6 fatty acids, amino acids, prebiotics and probiotics, and oligosaccharides in infant formula. Currently, there are differences in the composition of infant formulas, and antibodies and exosomes are content that is normally found in human breast milk are missing in infant formula. Gastroesophageal and gastrointestinal function and weight gain patterns are examples of health outcomes that require refinement in infant formula nutrition composition.

Poster Presentations- Session II

Thursday, May 2 | 9:30AM-11:00AM

Sandhu Conference Center

Health & Strategic Communication

39. Bridging the Gap: Training Strategies to Advance the Adoption of Cyberinfrastructure by Researchers

Presenter(s): Andrea Chirino, Ryan Johnson, Caroline Harvey

Advisor(s): Dr. Kerk Kee

Public funding for cyberinfrastructure (CI) is an investment counted in the hundreds of millions of dollars, but its reach beyond innovators in engineering, chemistry, and physics has been relatively limited. The diffusion of innovations theory, which guided this investigation along with grounded theory, indicates that adoption has not yet reached critical mass. Social sciences and humanities have been slower to adopt the use of CI tools. The lack of adoption by these disciplines prevents the recombination and aggregation of data to discover new insights that could have benefits to individuals, to organizations, and to policy-makers. A qualitative analysis of transcripts from CI professionals reveals strategies that can advance the adoption of CI. A subset (n=29) of 120 semi-structured interviews has been analyzed to conclude that there are five essential elements of training to cultivate the adoption and continued use of CI by researchers. Specifically, the CI professionals interviewed point to educating researchers about new possibilities in research that derive from the capabilities of CI, developing basic competency, learning how to get reliable access, matching specific CI tools to needs, and providing troubleshooting support to sustain use. A one-and-done workshop strategy is insufficient, as are general communications about a product. By mapping out the training to include these elements, organizations can more effectively promote adoption of CI.

Health Sciences and Kinesiology

40. A Ramos-COLO Hybrid Antibody Cell Fusion Targeting Pancreatic Cancer

Presenter(s): Avrita Brar

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

We explored cell fusion between Burkitt lymphoma-derived Ramos cells and pancreatic COLO cells. We hypothesized that when the cells fused, the antibody-producing Ramos cells would exchange DNA information with COLO cells creating an antibody hybrid which could target and kill the cells of interest, COLO cells. We expected that in the Ramos-COLO fusion, the cells are integrating each other's DNA through protein restructuring, leading to a unique hybrid antibody that can be used to direct the delivery of cancer drugs to cells. Ramos cells were treated with DEPC and the COLO cells were treated with Iodoacetamide in order to mutagenize the cells. Then, both mixtures were combined into a single tube to initiate the fusion process. Polyethylene Glycol was added to the combination to bring the cell membranes in close proximity by making the water between the two cells thermodynamically unfavorable. After centrifugation, the cell pellet was washed and re-suspended in culture media. These cells, alongside COLO cell controls, were plated in 96-well plates. After 10 days, cell culture supernatant containing hybrid antibodies from each well was added to wells containing unfused Ramos or COLO cells alone, to perform a WST assay which is a colorimetric method to detect cell proliferation. The WST assay plate results indicated statistically significant death or reduction in proliferation rates of COLO cells cultured with the fused Ramos-COLO cell supernatant. The results were analyzed via a statistical analysis, and significant

wells under the lower threshold were identified. In the reading taken after 45 minutes, there were 14 wells showing inhibitory activity. The 1 hour and 20 minutes reading showed 10 wells that demonstrated inhibitory activity, and the 2 hour reading showed 11 wells with significant inhibitory activity. Our next step is to confirm whether a hybrid antibody caused the COLO cells to stop proliferating. We will repeat this experiment to ensure that the results are repeatable, and then we will test specific significant wells from the results.

Interdisciplinary

41. Interaction with Nature: An Essential Key to Inner Happiness

Presenter(s): Arianna Ambe

Advisor(s): Dr. Jay Kumar, Dr. Gail Stearns

Nature is an integral element of this planet. It encompasses the pristine, untouched parts of the globe and serves not just as a link between humans and animals, but also as a reminder that we are not so different from each other. Nature's importance is palpable, but urbanization has long been distancing us from it, which perpetuates a belief that nature is insignificant to inner satisfaction. Yet, in large cities especially, levels of happiness have overall been declining. This raises a major question: does interaction with nature increase people's happiness? This research answers that question by showing that interaction with nature does indeed augment happiness and well-being. Numerous studies have been conducted to support this idea and simultaneously illuminate specific advantages of interaction with nature. These advantages encompass nature's ability to cultivate individual creativity and strengthen one's attention span, as well as foster within them other favorable qualities such as compassion. Further advantages include nature's ability to nurture one's environmentalist sentiments, which are proven to be interlaced with a healthy sense of spirituality and a demonstration of prosocial behavior. The brain, being a social organ at its core, benefits immensely from such behavior, as it actualizes the neocortex's desires for purpose, value, and meaning. The brain also benefits on a physiological level from interaction with nature, since blood flow to the subgenual prefrontal cortex is lessened through something as simple as a walk in the park. Such research makes it clear that nature is crucial to the self, and that it is a key to unlocking personal contentment. Because interaction with nature brings about inner happiness, every moment spent in nature and every effort dedicated to advocating its protection will only be rewarding.

Pharmacy

42. Simultaneous Targeting of mTOR and mLST8 in Human Breast Cancer Cells

Presenter(s): Melissa Coyle

Advisor(s): Dr. Hamidreza Montazeri Aliabadi

Despite our continually increasing knowledge of cancer biology and intracellular mechanisms, identifying targets for cancer treatment remains a challenge. Cancer cells are heterogeneous and plastic, which are involved in innate and acquired resistance to molecularly-targeted anticancer drugs, respectively. This project focuses on the PI3K/Akt cell signaling pathway, specifically Mammalian Target of Rapamycin

(mTOR) and GβL (mLST8), to halt cell proliferation. The breast cancer cell lines MDA-MB-231, MDA-MB-468, and AU565 were exposed to small interfering RNAs (siRNAs) targeting mTOR or mLST8, as well as a combination of both. The cell protein expression profile was studied to investigate the efficiency of protein silencing, and potential synergistic effect on downstream effectors of the pathway. Due to poor cellular internalization of siRNA, we also investigated the efficiency of small cell penetrating peptides specifically designed as siRNA carriers. Three cyclic peptides (WR5, [R5K]W5, and [R6K]W6) incorporating ring-forming arginines (as a cationic moiety for interionic interaction with nucleic acids), tryptophan (as a hydrophobic chain to enhance interaction with cell membrane, and lysine as the conjugation site for tryptophan chain were studied for in vitro siRNA delivery. The siRNA complexes formed with these amphiphilic peptides were delivered to the same breast cancer cell lines, and the efficiency of cellular internalization and mTOR and mLST8 silencing was investigated. Our findings confirm the efficiency of siRNAs in interrupting formation of mTOR complexes, and the activation of downstream proteins. Further studies are required to confirm these findings in patient cells, and to evaluate the efficacy of this approach in vivo.

43. Design and Evaluation of Fatty Acid Peptide Conjugates for siRNA Delivery and Silencing in Breast Cancer Cells

Presenter(s): Ryley Hall
Advisor(s): Dr. Keykavous Parang, Dr. Hamidreza Montazeri

Linear and cyclic fatty acyl-peptide conjugates were synthesized via solid-phase peptide synthesis for siRNA delivery and mRNA silencing in breast cancer cells. All peptides contained arginine, a positively-charged amino acid, a characteristic required to interact with the negatively charged siRNA. The peptides were conjugated with either palmitic acid (C16) or stearic acid (C18). The fatty acid component of the peptide was designed to improve the interaction with the hydrophobic residues in the phospholipid of the cell membrane. Therefore, the positively charged amino acid and the hydrophobic conjugates are designed to enhance the cell penetrating characteristics of the peptides. The attraction between the peptides and siRNA allows the peptide to encapsulate and stabilize the siRNA, and protect it against early degradation. This is a crucial feature since, without the protection and stability that the peptide provides, siRNA would not be able to penetrate the cell membrane and reach the cytoplasm. All four peptides, LP-C16, LP-C18, CP-C16, and CP-C18 were successfully synthesized and purified using Reverse Phase High Performance Liquid Chromatography (RP-HPLC), and the molecular weights were confirmed using Matrix Assisted Laser Desorption/Ionization Time of Flight Mass Spectrometry (MALDI-TOF). Future plans for this study include siRNA encapsulation and incorporation into Peptide Lipid Associated Nucleic Acids (PLANA), determination of siRNA delivery, and silencing effect of the PLANA complex.

Political Science

44. Political Preferences and Muslim Presence in California: A Geospatial Analysis

Presenter(s): Claire Norman, Avery Claire Bennett

Advisor(s): Dr. Andrea Molle

Our poster illustrates the preliminary results of an ongoing project of the Departments of Political Science and Peace Studies at Chapman University focusing on the growing Muslim community in California. We collected information about over 700 Islamic places of worship and Muslim businesses using publicly available websites and repositories. We accounted for several socioeconomic variables including tradition, type of governance, ethnic preferences, language, inclusion of women, presence of education programs, and level of openness to non-Muslim customers. The long-term goal of the research is to provide a more accurate measure of the level of openness of Muslim communities to multiculturalism. Here we focus on multiculturalism and its impact on voting behavior. We present a geospatial analysis of political preferences distribution in relation to the presence of a Muslim community. We also show the level of ethnic and socioeconomic diversity as to illustrate the concrete impact the presence of Muslim communities has on the evolution of the State's political landscape. We hope this would help facilitate greater political awareness and better policy design to address the rapid demographic changes in the Golden State.

45. Conspiracy Theories and Mistrust of Government

Presenter(s): Roxy Amirazizi

Advisor(s): Dr. Ann Gordon

In recent years, government mistrust seems to be at an all time high. According to Pew Research Center, only 18% of Americans say they trust the government to do what is right. Data collected by Chapman University in their annual American Fears Survey is used to explore the relationship between those who marked a belief in conspiracy theories and those who indicate a fear of government. Conspiracy theories, specifically those involving political figures, such as the assassination of JFK and the causes of 9/11, and a fear of those in power have one major thing in common: a mistrust of government. I predict that because of this, there will be a strong relationship between these variables. Interestingly enough, despite the rise in mistrust of government, a very little amount of research has explored this topic. Trust and confidence in government is essential to a healthy democracy; therefore, we must explore groups who have inclinations to doubt or fear institutions in power.

46. America'sThoughts on a Southern Border Wall

Presenter(s): Nicolas Houser, Nicolas Houser

Advisor(s): Dr. Ann Gordon

During the fiasco that was the 2016 presidential campaign Donald Trump made a promise of a border wall on the southern border with Mexico. This is a very controversial topic on both sides of the political spectrum in today's media and each parties political agenda. I will Look at the level of agreement of the following statement " America Should build a wall on the border with Mexico", and use the CSAF. I will also use data from the American public's attitudes toward US–Mexico border security were conducted by the Pew Research Center,

Ipsos Public Affairs, and the Monmouth University Polling Institute.I hypothesize that Political affiliation will greatly affect whether or not a person agrees, as well as how a person's whereabouts and nationality affect your level of agreement. I expect to find Republicans will majority agree and Democrats will disagree with the idea, I also infer that the area affected by immigration such as border states will most likely support with the statement above. I will lastly look at social identity theory and how one's perceived membership to a particular group has a relationship between an American national identity and American public opinion on Immigration.

47. The Effectiveness of Emergency Preparedness and People with Disabilities

Presenter(s): Ellie Weinberg

Advisor(s): Dr. Ann Gordon

People with disabilities are more likely to experience the effects of emergency disasters and have a higher mortality rate due to the ineffectual implementation of laws and policies, unqualified responders, and little to no information on how to protect themselves. With efficient law reform and enforcement, awareness of inequalities, and proper actions taken by authorities, this issue which has taken many lives can be aided. In Chapman University's Survey of American Fears, there are two survey questions which focus on people with disabilities and people living with others who have disabilities in regards to their level of preparedness should an emergency event take place. Variables which will determine levels of preparedness will be how scared people are of disasters, the location of the individual, ages, gender, and race. Disability law and policies will play a factor in the study as well as instances of ineffective implementations of the Americans with Disabilities Act which addresses architectural requirements such as construction of accessible buildings and public accommodations for those with disabilities. There have been several cases in which people with disabilities have had to relocate from assigned shelters due to inadequate facilities alongside offenses in where wheelchair users have been stranded in neck-high waters since no emergency evacuation plans of policies had been implemented. This research is aimed at answering the question of why preparedness of people with disabilities is lower than that of able-bodied individuals, taking into account the variables to control for the outcomes of levels of preparedness as well as how certain government requirements are enforced to assure accessibility and what can be done to guarantee adequate accommodations as specified in the Americans with Disabilities Act.

48. Who Cares About Opioid Addiction?

Presenter(s): Daniela Zavala

Advisor(s): Dr. Ann Gordon

With current focus on the regulation and banning of nicotine-based drugs, the discourse surrounding the current opioid addiction/overdose crisis, that the United States is plagued with, is not so discussed and in fact is only being included as a topic in the National Election Survey in the 2018 Pilot Study. The new development in this topic leaves virtually no strong or prominent theory from the political field. However, using the neoliberal economic theory lens, an analysis of the levels of urgency theorizes that there is a correlation due to where opioids have been heavily prescribed via healthcare providers and those who are involved with some degree of drug violence in their lives. The lack of discourse leads for there to be a gap in knowledge and action that this paper will fill in, through an analysis of public opinion data from the American National Election Studies to evaluate that levels of urgency will vary due to the participants' state of residence to see if they correlate with areas where there was a hike in healthcare opioid prescriptions, as there was indeed a hike in particular regions that will be discussed.

49. True or Skew? Examining the Meaning of 'Fake News'

Presenter(s): Orion Huang

Advisor(s): Dr. Ann Gordon

Currently, Americans are flooded by the rapid growth of media information; Bombarded with a profuse amount of perspectives, stories, and claims. This daily assimilation of gathering news through internet, newspapers, and television sources have left Americans to question the credibility and trust in news - whether it is trust in the news information or trust in the media corporations themselves. The controversy in news media credibility is incredibly relevant today as we consistently see politicians such as President Trump use the term “fake news” to accuse and threaten news organizations. However, do news audiences have their own opinion of what they call news? Does the phrase “people believe what they want to believe” true? Utilizing data from the Chapman University National Survey of Fears, I delve into the causations and correlations of the people who are skeptical of “fake news”. I investigate the possible causes of media distrust as well as analyze it using a theoretical model. The findings of my research show that people are more skeptical of news when it derives from an unpreferred online or TV news source. According to research firm Zenith, since the 2016 election, media consumption has increased drastically. In the 21st century, there is more weight on the consumer to pick and choose a news source; therefore, people tend to trust a news organization they find commonality with. This knowledge allows me to examine factors that affect media skepticism such as specific media organizations, mainstream news sources, non-mainstream news sources, partisanship, and more. I conclude with a discussion or the significance of how individuals rely on their own criteria and judgement to determine their trust in the media and the implications of this for the American political process.

50. Public Opinion on America’s Criminal Justice System

Presenter(s): Camille Bayard

Advisor(s): Dr. Ann Gordon

An overarching theme of today’s political issues involve discussions on crime. Whether it be within the realm of immigration policy and if it brings in more crime from across the border to debates on the current drug problems of the US, crime control is a topic much of the public has polarizing views on. This research paper will use the ANES 2016 survey to explore the public’s opinion on controlling crime. There will be an exploration of how much money within the federal budget should be spent on controlling crime, connecting opinions based political affiliation, general education level, knowledge of the American criminal justice system, and experience within the system. Recent statistics raise the question of just how important controlling crime is to the general public in regards to the amount put towards it within the federal budget. Is the fear of a crime happening enough to prioritize more spending within the federal budget? It would seem that people are more concerned with punishing convicted criminals through the use of tougher prison sentences than they are with rehabilitating offenders. Yet this seemingly straightforward public demand, may not be so clearcut. This report investigates a number of reasons why examinations of people's attitudes toward crime and punishment often produce conflicting results. It is argued that without taking political affiliation, education level, and experience with the criminal justice system into account, an accurate picture of the public’s beliefs concerning the importance of crime control will not be captured.

51. Conspiracy Theories and The United States Government

Presenter(s): Niki Ardebili

Advisor(s): Dr. Ann Gordon

Conspiracy theories reflect a level of doubt, distrust and uncertainty between individuals and and common societal beliefs. A few of the most speculated conspiracy theories regarding the government and public trust are the 9/11 attacks and the John F. Kennedy assassination. However, the people that believe in these theories follow several trends that lead them to the conclusion that the government is relaying them misinformation. This paper conducts a cross-national analysis of public opinion data on a) how income effects government trust and belief in conspiracy theories, b) education level and belief in government trust and conspiracy theories and lastly, c) religious affiliation and government trust and belief in conspiracy theories. Multivariate regression results find that as income decreases belief in government distrust and conspiracy theories increases. Even more striking a strong belief in religion correlated directly with an increase in conspiracy theory belief as well. Lastly, more educated individuals tend to believe that the government is being misleading. This implies that in general more affluent, more educated people doubt the government more than the average American.

Psychology

52. The Effect of Cannabis Use on Physical Activity

Presenter(s): Lydia Ong

Advisor(s): Dr. Vincent Berardi

With the growing prevalence of cannabis use and its legalization in multiple states, it is important to understand the relationship between cannabis use and health behaviors such as physical activity (PA). Conflicting findings report cannabis users are less likely to be obese than non-users, while other studies report cannabis use as associated with low levels of sport and exercise, but not the broader scope of recreational PA. Thus far, these studies have relied on self-report measures of PA. This study aimed to more precisely explore the relationship between cannabis use and PA using objective measures of PA. Data were obtained from the National Health and Nutrition Examination Survey (NHANES) covering adults ages 20-59 (N=2,092) from 2005-2006. PA was measured using hip-worn accelerometer data categorized into minutes of light PA and moderate-to-vigorous PA (MVPA). Cannabis use was measured through self-report and categorized into current users (smoked in last 30 days) and non-current users. Descriptive analysis and multivariate regression were performed to analyze associations between cannabis use and light PA and MVPA. Covariates in our cross-sectional analysis included age, gender, race/ethnicity, poverty, education, BMI, tobacco, and alcohol use. On average, current users engaged in significantly more light PA than non-users (373.21 min/day vs. 348.31 min/day, p=0.04). Similar results were found for MVPA (32.99 min/day vs. 26.49 min/day, p=0.003). However, once controlling for age, gender, and education, the effect of cannabis use on PA was no longer significant. Age and higher education level were negatively associated with light PA, with older adults and college graduates+ spending less time engaging in light PA. Age, gender, and lower education level were negatively associated with MVPA, with females and non-college graduates spending less time engaging in MVPA. Cannabis use was positively correlated with light PA and MVPA—a counterintuitive finding. However, majority of this effect seemed to be associated with the demographic of cannabis users.

53. Adaptive Signage Promoting Physical Activity

Presenter(s): Bradley Pelham, Bradley Pelham, Julia Frederick

Advisor(s): Dr. Vincent Berardi, Dr. Benjamin Rosenberg

With public health and physical activity becoming an increasingly prevalent topic in today's society, it is important to investigate the ways in which small bouts of physical activity can be promoted throughout the day. A common way to reach this goal is promotion of stair versus escalator use, which has been extensively studied. Nearly all previous research in this domain has focused on the use of static signage to promote physical activity. While these research findings have indicated a positive influence as a result of the static signage, there is minimal research that has been conducted in regard to using adaptive signage to promote physical activity. This study aims to conduct a literature review to determine the prevalence and features of adaptive signage in interventions. A literature review was conducted examining the prevalence and features of the use of adaptive signage in interventions. The following terms were used as the basis for the search: digital signage, dynamic signage, adaptive intervention, gamification, and interactive signage. A review and summarization of 30 previously published research articles was conducted. The results from this literature review were discussed to determine a method for carrying out an adaptive signage intervention. The results from the literature review indicated a gap in current research that focuses on adaptive signage in the context of public health interventions. The current norm for these types of interventions consists of static signage aimed at promoting a certain behavior. Furthermore, current research has shown that the current technology being used in stair studies is mainly rudimentary and lacks the use of modern technology. The results from this literature review led to the desire to conduct an adaptive intervention study in a college dorm using modern technology for the signage and data gathering equipment. However, the need for this type of study must first be assessed using an observational study which is planned to be conducted using pedestrian tracking mats.

54. Physical Activity and Cognition: What's the Connection?

Presenter(s): Danielle Zahn

Advisor(s): Dr. Julia Boehm

Physical activity (PA) is considered an essential component of a healthy lifestyle, providing both health and cognitive benefits for all ages. Cognitive benefits associated with PA include improvements in concentration and various memory systems, such as working memory (WM). The WM system is necessary for daily tasks and plays a significant role in the academic performance of school-aged children as it is related to comprehension, reasoning, and problem-solving. Previous research has suggested a relationship between PA and improved cognitive function in adults for both acute episodes of PA and long-term PA programs. However, the relationship in children remains unclear, and the association between acute PA and WM specifically has not been thoroughly examined. This study investigated the effects of an acute episode of PA on children's WM capabilities. We hypothesized that children would show improvements in their WM performance after engaging in acute PA when compared to their WM performance prior to PA. Participants included third, fourth, and fifth grade elementary school students (N = 84) with an average age of 9.17 years (SD = .90). WM was assessed through a counting span task administered before and after participants engaged in 15 minutes of PA comprised of relay races. Findings were consistent with the hypothesis, indicating that children obtained higher WM scores (M = 26.17, SD

= 4.40) after participating in PA compared to before (M = 24.58, SD = 5.57), showing a significant improvement in their WM, t(83) = -3.24, p = .002, r = .34. These results have implications for education policy and suggest that schools should provide children with opportunities for acute episodes of PA throughout the school day (e.g., recess). Findings highlight PA's role in children's improved WM which has the potential to translate into improvements in academic performance.

55. Positive Psychosocial Resources and Childhood Health

Presenter(s): Ashleigh Dimpflmaier, Gigi Cliatt, Kathleen Glasser, Natalie Moorhead, Abby Paine, Amber Rahim
Advisor(s): Dr. Julia Boehm

We investigated the association between positive childhood characteristics and concurrent childhood health. Specifically, we looked at the association between positive psychosocial resources and the amount of time missed from school due to illness, as well as physical symptoms. Using data from the National Development Study, we rated essays written by 11 year olds for factors such as optimism, purpose, and personal relationships. These are what we categorized as psychosocial resources. Previous studies have investigated how poor mental health is associated with physical health, but there hasn't been much work done in the positive domain. We hypothesized that 11 year olds who have more psychosocial resources will exhibit better health than other 11 year olds who have fewer psychosocial resources. Contrary to our hypothesis, there was no significant relationship between the sum of psychosocial resources and the amount of time off school. 11-year-olds who missed less than 1 week of school in the past year (M=17.53, SD=2.87) did not have significantly different psychosocial resources than those who missed 1 week to 1 month (M=17.69, SD=2.85), nor those who missed 1 month or more (M=17.39, SD=3.21), F(2,490)=.23, p > .05. We also examined the relationship between psychosocial resources and total symptoms or health problems at age 11, but the correlation coefficient was also insignificant (r=0.06, p > .05). It is important to note that the data presented is correlational and therefore causality can not be drawn. Despite the findings being insignificant, this is still an avenue of research that should continue to be investigated and understood.

56. Peer, Media, and Family Influences on Body Image

Presenter(s): Batool Kweider, Batool Kweider, Kylee Garfield
Advisor(s): Dr. David Frederick

Body image dissatisfaction is a core issue within society, and rather than the focus being on body positivity movements, pressures seem to be the stronger influences on people. Through a survey posted on Survey Monkey, 355 college students, including 286 women, 65 men, and 4 other responses completed the Objectified Body Consciousness Scale, Social Comparison Scale, Overweight Preoccupation, Appearance Evaluation, as well as measures of Surveillance, Appearance Evaluation, and the Social Attitudes Towards Appearance Questionnaire (SATAQ-4). In almost all cases, the media pressure was the strongest predictor. It was the strongest predictor of internalization of the thin ideal (B = .43, p < .001), appearance surveillance (B = .44, p < .001), social comparison (B = .31, p < .001), and overweight preoccupation (B = .38, p < .001). Which ultimately reflects upon the stigma towards body image within the context if media. The importance of furthering such a study is seeing how society can combat these toxic pressures and promote a positive body image.

57. Associations of Pain and Quality of Life in Pediatric Patients Post-Surgery

Presenter(s): Hannah Pickerill

Advisor(s): Dr. Brooke Jenkins

Higher pain levels have previously been associated with lower health-related quality of life in older individuals with prolonged chronic pain and neuropathic patients. However, this relationship has not been investigated in children undergoing surgery. Therefore, we evaluated the pain levels of children following minor elective surgery using the Faces Pain Scale, and their quality of life as reported by their parents or guardians using the Pediatric Quality of Life Inventory (PedsQL). Pain on follow-up day 1 was correlated with the physical ($r(56) = -0.365$, $p = 0.006$) and emotional ($r(56) = -0.365$, $p = 0.006$) subscales of the PedsQL, but not social or school related quality of life (p's $> .05$). On day 3, pain levels were correlated with physical ($r(49) = -0.333$, $p = 0.019$) and school-related ($r(49) = -0.333$, $p = 0.019$) quality of life, but not emotional or social quality of life (p's $> .05$). Day 7 post surgery pain was significantly correlated with only the social subscale (social: $r(51) = -0.25$, $p = 0.074$). Pain was also correlated with overall quality life on each day of follow-up (p's $< .05$). On follow-up day 1, there may have been an association between pain and quality of life for only the physical and emotional measures because the children were not in school or socializing the day after surgery. In contrast, on day 3, pain levels were associated with the physical and school-related subscales possibly because the children had returned to school and faced difficulties participating because of their pain. On day 7, most children reported little or no pain, but pain levels were still associated with the social aspect of quality of life, possibly because lingering pain may have made it difficult to participate in social activities like playing games. Given that pain has differential effects on quality of life across post-operative recovery days, future research should be done to determine factors and potential interventions which might more effectively increase quality of life in the presence of pain.

58. Addressing Stigma Through Evidence Based Recommendations: An Introductory Fact Sheet on Consensual Non-Monogamy

Presenter(s): Olivia McLeod, Ashley Ramos

Advisor(s): Dr. Amy Moors

An integral part to sexuality science is bridging the research-outreach gap through the creation of public educational materials. While there has been a resurgence in empirical and clinical attention to consensual non-monogamy (CNM), the distribution of its findings are not easily accessible. Recent studies have shown that 1 in 5 people report having engaged in a CNM relationship (polyamorous, swinging, and open relationships) in their lifetime (Haupert, Gesselman, Moors, Fisher, & Garcia, 2017). Meanwhile, the general public has yet to recognize its presence in mainstream culture. The goal of this project is to create a Consensual Non-Monogamy Fact Sheet, as part of the American Psychological Association Division 44 Consensual Non-Monogamy Task Force, to provide (1) an overview of recent research (e.g., prevalence, relationship qualities, mental health), (2) empirically supported recommendations for clinical practice and research, and (3) ways to reduce stigma surrounding these relationship styles. Using a mini-Delphi method, we outlined themes of converging information, engaged in reiterative feedback with experts, and condensed the most suitable information for a diverse audience into a concise, digestible fact sheet. In addition, the CNM fact sheet helps bridge the research-outreach gap by addressing common misconceptions about CNM and serving as an introductory tool for those

who are uninformed about the topic. Stigma surrounding CNM has led to a lack of empirical research (Conley, Matsick, Moors, & Ziegler, 2017) and clinical errors in treating individuals who practice CNM (Schechinger, Sakaluk, & Moors, 2018). This project addresses the need for evidence-based, accessible, and easy-to-read information on human sexuality.

59. Gender Prescriptions and Stereotypes Surrounding Consensually Non-Monogamous Relationships

Presenter(s): Carsyn Knebel, Gabi Siguenza, Meghan Dunn
Advisor(s): Dr. Amy Moors

Background Sexuality is a domain in which stereotypes and expectations are particularly pronounced for women and men (Alexander & Fisher, 2003). In the current study, we examined people's perceptions of whether women or men are more "biologically wired" for and likely to suggest engaging in swinging, open, and polyamorous relationships (known as consensual non-monogamy or CNM). Central to our analysis are comparisons by relationship style (single, engaged in monogamy, engaged in CNM). Methods Using online recruitment strategies (N = 1,020; 65% women; M = 34 years), we assessed gendered perceptions of CNM relationships among participants who were currently single (n = 203), in a monogamous relationship (n = 242), and in a CNM relationship (n = 575). Participants were asked to rate the extent to which they believed women or men (mid-point 50/50 option) were naturally inclined to engage in a CNM relationship. Next, participants answered similar questions about swinging, open, or polyamorous relationships. Results Results show that men were perceived as biologically wired for and proactive in suggesting a CNM relationship by people who had never engaged in CNM. However, people currently engaged in CNM perceived both women and men as equally likely to be predisposed to engage in or suggest CNM. This pattern of results was found across perceptions of swinging, open, and polyamorous relationships. Across all analyses, relationship style was the main factor that affected gendered perceptions of CNM; participant gender and age were not significantly related. Conclusions This research extends previous findings on gender differences in expectations of sexual behavior (Conley, Moors, Matsick, Ziegler, & Valentine, 2011) in the new context of multi-partnered sexual and romantic relationships. People who had never engaged in CNM rated men in stereotypic ways compared to people currently in CNM relationships. The results suggest a mismatch between expectations and actual CNM behaviors among women and men.

60. The Effect of Team-Building Interventions on Group Cohesion and Academic Performance

Presenter(s): Olivia Boyd, Erica Green, Andie Burns, Carly Nasch, Hannah Pickerill
Advisor(s): Dr. Benjamin Rosenberg

The present study investigates the effect of group cohesion on academic success in undergraduate students in a semester-long group project. Students in Research Methods classes form small groups at the beginning of the semester and conduct experiments with their teammates throughout the course. Oftentimes, professors do not include any team-building interventions in their class sessions. However, research shows that a sense of group cohesion enhances group performance across various settings (e.g., on sports teams). The more cohesive a group feels both socially and professionally, the more likely they

are to work together towards shared goals. This research aims to test whether interventions that are meant to enhance group cohesion in a classroom setting impact perceived and actual group and academic performance. At the beginning of the semester, two sections of Research Methods in Behavioral Science received a pretest survey to determine their baseline cohesion. Throughout the semester, students in the experimental class participated in three team-building interventions that involved answering three personal reflection writing prompts to fill out at home and bring to class. This technique is known as Personal-Disclosure Mutual-Sharing (PDMS). On the intervention days, each group met and had a discussion in which they shared their personal answers with the group. The control group only received surveys throughout the semester that measured their cohesion. After the groups complete their projects at the end of the semester, each participant will fill out a posttest survey rating perceptions of cohesion within their group; in addition, we will collect students' final grades to determine if the interventions had any significant effect on their performance. We expect that groups who participate in the interventions will have a greater perceived sense of cohesion with their team members, which will ultimately improve their academic performance.

61. Trolley Problem: An Exploration

Presenter(s): Christopher Falco

Advisor(s): Dr. Benjamin Rosenberg

Current studies in ethical decision-making utilize hypothetical ethical dilemmas as measures. Most commonly used is Greene et al.'s (2001) trolley problem, in which participants are asked if they would allow a runaway trolley to hit five people or divert the trolley onto another track where it would hit one person. In a prior study investigating ethical decision-making, we found that women rated their decisions as less morally acceptable than men, and that number of people at stake in the dilemma can affect the perceived moral acceptability of a decision. Though some studies have found that men "pull the lever" at a higher rate than women, no studies have utilized qualitative data analysis techniques to understand why; further, no other studies have manipulated the number of people at stake in an ethical dilemma to assess any potential effect on moral acceptability. In an attempt to validate these findings, as well as better understand the root of these phenomena, we have designed a second study in which participants will also provide justifications for their decisions. We will utilize qualitative data analysis in an attempt to understand why women rate their decisions as less morally acceptable than men, as well as discover any change in rationale behind decision made in the context of different numbers of people at stake. We expect to find a significant effect of number of people at stake on moral acceptability of decision made as well as a significant effect of gender on moral acceptability of decision made. We also expect there to be different justifications for decisions made across genders. Reference: Greene, J. D., Sommerville, R. B., Nystrom, L. E., Darley, J. M., & Cohen, J. D. (2001). An fMRI investigation of emotional engagement in moral judgment. Science, 293, 2105-2108.

62. Characterizing Range Anxiety in Electric Vehicle Users

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

Advisor(s): Dr. Uri Maoz

Range Anxiety is the fear of running out of fuel for your car before arriving at a refueling point or final destination. While usually absent or low in gas powered vehicles, this anxiety is a salient consideration when buying electric vehicles (EVs). This and the fact that there are fewer charging stations available compared to gas stations has been offered as hypotheses for why EV sales are low. Previous research has found that those with more experience driving EVs, felt less range anxiety as they can when and where to charge their vehicle in their daily lives. EVs are more environmentally friendly and safer for the driver, so it important to better understand range anxiety and find ways to mitigate it in order to lift one of the barriers for greater adoption of electric cars. In this study, we plan to provide EV drivers with an EV on low charge. They will be asked to drive around for as long as they feel comfortable, up to 30 minutes. As they are driving, their heart rate and galvanic skin response (a measure of emotional arousal) will be monitored to measure their anxiety as they watch the battery percentage of the electrical vehicle decrease. After driving around in the vehicle, participants will be asked to complete a survey evaluating their habits and their daily use of the vehicle. Some of the questions asked will query the type of electrical vehicle they usually drive, their perception of etiquette around unplugging another person's charging electrical vehicle in a public location if their own batter is low, and how comfortable the person is driving at a low percentage in their electrical vehicle. We anticipate seeing an increase in heart rate and galvanic skin response, and therefore range anxiety, as the battery percentage gets lower.

63. Prospective Study: Physical and Mental Health Benefits of Active Commuting Via Electric Bicycles

Presenter(s): Jake Gavenas, Natanael Alpay, Rebecca DeAngelis

Advisor(s): Dr. Amir Raz

The E-Bike Study seeks to conduct scientific research on the health benefits of E-Bikes. E-Bikes are bicycles with a battery-powered "assist" that comes when pedaling. When a person begins pedaling, the motor activates and increases velocity. For this reason, E-Bikes allow someone to travel long distances at fast velocities while requiring less energy to be exerted than on a regular, non-electric bicycle. In this study, 30 participants, ranging in age, gender, and occupation, will be asked to E-Bike to their place of work 5 times per week. Each time participants commute on E Bikes to work, several physiological measures, such as heart rate, Galvanic Skin response, and brain activity, will be monitored. Subjects will be rewarded each time they ride their E-Bike to work to encourage participation, as well as prevent attrition. This study will take place in Irvine, California, which is a prime location due to the city having over 300 miles of on-street bikeways and over 60 miles of off-street bikeways, as well as the weather being sunny and clear the majority of the year. Irvine's infrastructure and size provides a safe environment for this study to be conducted. The goal of this study is to determine the exact health benefits, both physical and mental, of riding E-Bikes, as well as to encourage more of the population to convert to two-wheel transportation, which is more environmentally friendly.

64. Pupillary Change After Decision Making Tasks

Presenter(s): Gilana Pikover, Andy Liang, Kate Harder, Romi Kariv

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

Various studies have shown increased pupil dilation during effortful decision making tasks (Kuchinke et al., 2007), fatigue (Merritt et al., 2004), and even various mental disorders (de Rodez Benavent et al., 2017). Because neurochemicals such as norepinephrine also cause pupil dilation, it appears that norepinephrine is involved in such decision-making tasks. However, there is little investigation into the pupillary responses to a subject recognizing what they believe to be a known answer or decision. This study will investigate whether pupillary responses can cause involuntary or unconscious cueing as found in the "clever Hans" effect (Pfungst, 1911). Pupil dilations will be examined in participants as various possible answers to a previously displayed question will be presented on the screen. Pupillometry will be used to investigate any pupil changes related to the participant seeing and knowing the correct answer.

65. Measuring Neural Time Series Data in a Sensory Deprivation Tank

Presenter(s): Jackson Gregory

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

We are interested in studying the neurological and physiological effects of the float pod, also known as REST therapy. Float pods rely on the concept of depriving most senses (sound, light, temperature, and proprioception) in a pool filled with buoyant salt water at body temperature. While float pods are most commonly used in spa environments, we intend to look at the potential benefits of floating under the empirical lens. In this study, we will measure neural activity using electroencephalography (EEG). We plan to look at the different levels of relaxation and the brain frequencies are associated with relaxation. Research done in this field has shown that the float pod induced a state of relaxation and heightened introspection in participants with high levels of anxiety (Feinstein et al., 2018). Research has also shown that the float pod may be a promising technique for reducing suffering in individuals with anxiety and depression (Feinstein et al., 2018). There is little research on the topic of float pods, and there have been no successful attempts to record EEG inside a float pod, to the best of our knowledge. We are currently able to record 6-channel EEGs on the frontal lobe. However, we are still working on the EEG signal quality and signal to noise ratio (SNR). The goals is to overcome those challenges, which were brought about by electrocardiography (ECG) artifacts and moisture in the pod and then adjust our EEG cap and electrodes accordingly. We are addressing this problem by adjusting the position of the referential electrode and materials that we use to make the EEG cap. This has been effective in reducing the ECG artifact, but it has not eliminated it. We aim to improve the SNR of EEG signal in the float pod and be capable of recording in a continuous and stable fashion. Once stable EEG recordings are obtained in the float pod, various experimental paradigms will be introduced inside the float pod.

66. Exploring the Rubber Hand Illusion

Presenter(s): Cristina Uribe, Andrea Venderby, Romi Kariv

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

While the body ownership distortions induced by the Rubber Hand Illusion (RHI) largely rest on feedforward multimodal integration of sensory information, recent studies suggest that higher-order cognitive processes modulate these effects. In order to test the influence of these higher-order processes, we plan to use a within-subject design where participants will undergo the RHI under 4 experimental conditions: 1) Attending to the visual signal and synchronous stroking of the arm; 2) Attending to tactile sensation and synchronous stroking of the arm; 3) Attending to visual signal and asynchronous stroking of the arm; 4) Attending to tactile sensation and asynchronous stroking of the arm. These conditions will be counter-balanced across subjects. The crossing of attended sensory signal and attention target will allow us to measure the variation of the magnitude of the effect across these 4 conditions. We hypothesize that modifying the attention to the visual and tactile stimuli will alter the RHI. Although previous studies have emphasized how important body ownership is in self-referential processing and the phenomenology of agency, few studies have looked at the cognitive aspect related to body ownership. (Armel & Ramachandran, 2003; Tsakiris & Haggard, 2005; Farmer, Tajadura-Jimenez & Tsakiris, 2012). This study will help us have a better scientific understanding of the role of cognitive factors in feelings of body ownership. Most importantly, this study will provide insight into essential questions of cognitive science. These understandings will be useful for future research on various related medical conditions, such as phantom pain and asomatognosia.

Religious Studies

67. Religious Influence in Predicting Political Alignment

Presenter(s): Brennen Ramos

Advisor(s): Dr. Ann Gordon

Religion is an essential part of an individual's being, so important in fact, that battles have been fought over the differences between them. Within the United States, today's battles are often fought on a much different scale, one less religious oriented and now a more political one. With sides becoming increasingly Democratic versus Republican, the question is where do religious immigrants and other worshipers who hold true to their religious beliefs find themselves. This paper will dive into whether the change of times has caused religious followers to split the two political parties apart or if the two political parties have begun to split religious followers apart. Relying on the CSAF, a national representative survey, data analysis will show how individuals align themselves today and if religious influence can help predict political alignment on hot-topic subjects such as elections, immigration, and gun control. It is expected that patterns between different religions will arise on the topics at hand. With hope, these patterns explored may change both how politicians decide to campaign towards different groups, and how religious believers will vote on these topics in the near future.

68. Psychological Benefits of Faithful Prayer

Presenter(s): Caroline Kutschbach

Advisor(s): Dr. Gail Stearns

This paper will describe the religious practice of prayer, broadly defined, and explore its direct effects on the brain and potential outcomes produced by an individual's desire and behavior in coming into communion with the divine. Forms of prayer and meditation from a multitude of diverse religious traditions will be explored through a scientific lens, neither confirming nor rejecting the existence of the divine or divine intervention. The aim is to assess the benefits of prayer, both physiologically and psychologically, through the analysis of scientific data. Studies show the power of prayer to alleviate anxiety, bringing peace to the one praying. Participating in prayer also elicits positive emotions, like gratitude, that directly affect the brain, as well as negative emotions that can lead to introspection. Structured prayer can stop rumination on negative and self-deprecating thoughts that are often associated with anxiety and depression. Studies also show that prayer is most effective when an individual has faith and that faith has a profound effect in healing processes.

69. Those Who Stand Alone: The Significance of Tamar, Rahab, Ruth, and Bathsheba

Presenter(s): Ashley Henning

Advisor(s): Rafael Luévano

The Gospel of Matthew begins with the genealogy whose summit is the birth of the Messiah Jesus. Included in this lengthy genealogy of seventeen verses and fourteen generations, there are forty-two men named, and four women not including Mary, only three of whom are given names: Tamar, Rahab, and Ruth. The fourth and only unnamed woman is Bathsheba. The male dominance of the genealogy raises the question: why include these four women? What role did these women play individually and collectively to the author's writerly intention of the genealogy? All of these women were unconventional wives and mothers, yet they all serve a specific role that was significant enough for Matthew to mention them in Jesus' genealogy. Tamar, a widow, is left childless after her marriage to Er, son of Judah. Judah's lineage appears to have come to an end when Er and his other son, Onan, are killed by God. Tamar saves Judah's line when she disguises herself as a prostitute in order to conceive a child with him. Rahab, a prostitute from Jericho, takes in two Israelite spies and protects them. As repayment for her kindness, the Israelite spies promise to spare her life when Jericho is destroyed. She then marries Salmon and becomes the mother of Boaz, the great grandfather of King David. Ruth is a Moabite woman whose risky steps help to build the house of Israel. After her first husband dies leaving her childless, Ruth goes to Bethlehem and marries Boaz, thus becoming the great-grandmother of King David. Lastly, Bathsheba, who Matthew refers to as "the wife of Uriah," fosters a child with King David while still married to Uriah. David orchestrates a plan to have Uriah killed in battle so that he can marry Bathsheba. After years of marriage, Bathsheba persuades David to give the kingdom to her son, Solomon, instead of his other sons. This paper will find that these four women play a key role in both the salvation of history and also in the salvation of women.

Sociology

70. Asian American Representation on Social Media Platforms

Presenter(s): Ashley Lee, Hayley Nelson

Advisor(s): Dr. Stephanie Takaragawa

YouTube is a popular social media platform where anyone can make an account and post any kind of content. When YouTube launched in 2005-06, it has since allowed minorities easier access to create stories in an industry that has a history of exclusion and whitewashing, specifically speaking about Asian Americans. Asian American content creators, such as Wong Fu Productions, Michelle Phan, Ryan Higa, and many others use YouTube as an outlet to adapt existing stereotypes into entertainment while resisting whitewashing in Hollywood. With the lack of Asian American representation in mainstream media, we wanted to examine where people consume relatable content. Now with the advancement of technology, YouTube became the platform for individuals to create all sorts of entertainment for people to enjoy just by a click away. In the beginning years when YouTube began, Asian Americans were prevalent producers and creators on the platform. It ranged from musicians, dancers, make up artists, and many more. This new platform acted as a gateway for Asian Americans to express their talent and passions through producing videos. By analyzing their large influence online, we try to better understand who consists of their target audience, either it be Asian Americans or more broad. This will bring up the question: does this cause non-Asian American viewers to adapt their existing beliefs, or does this ultimately reenforce preconceived notions?

Software Engineering

71. Schedule - It

Presenter(s): Stefani Guzman

Advisor(s): Dr. LouAnne Boyd

Human-Computer Interaction, also known as HCI focuses on creating products that are easy to learn, effective to use, accessible, and that provide an enjoyable user experience. Not only is HCI critical in developing any product, but making sure the product has a purpose; hence, people will want to use it, is also of importance, Precisely because of this my project focuses on helping the Chapman University community by allowing them to efficiently and effectively organize their calendars, but also allowing the students to foster relationship at the same time. The research conducted regarding user preferences in layout, accessibility, multi-modal interaction, and design has impacted the outcome of the overall development of this app. With the research and implementations done, “Schedule - It” has become a calendar app that allows users to add events to their personal calendar through different modes of interaction. This calendar app is synced with Chapman University events, clubs, and greek life, which allows students to stay connected to what is going on in school with a click of a button and without searching it anywhere else. “Schedule - It” is not your typical calendar app, but gives one a more compact personal and social calendar. This app has the ability to easily share your calendar with others without having to use an external app, which takes away the stress of arranging meetings manually, or go through

the anxiety of finding time for your personal life in a packed agenda. In other words, this is the app where the share-ability and accessibility of Calendly meets your typical calendar and your campus agenda as well.

72. Artificial Intelligence: The Ways to Learn

Presenter(s): Matthew Tonks, Charlie Liu, Charlie Filce

Advisor(s): Dr. Michael Fahy

We compare three different types of Artificial Intelligence learning methods - Genetic Algorithms, the Carrot and Stick approach, and Tensorflow – by using each method to learn to play the simple game of Pong. We will analyze the differences in the effectiveness of these Artificial Intelligence methods to solve the same problem, and explore the implementation differences of each method. We will create four web sites to showcase our project and each of the different approaches to Machine Learning. The web sites will show the different patterns that can be observed when observing the progress of the AI. We will also do a formal analysis of each of the AI methods at various stages throughout its development of a solution. We will attempt to determine the best time to check the progress of each AI method to facilitate analysis. We hope to gain insight on how to learn, understand and solve a simple problem by observing how each AI learns a game from scratch and uses repeated failures to find success.

Strategic & Corporate Communication

73. Film Distribution Brand Recognition, Critical Reviews, and Box Office Numbers

Presenter(s): Lindsey Hill, Jasmine Solorzano-Maya, Brandon Garcia

Advisor(s): Dr. Austin Lee

Currently, the film industry accounts for over one billion dollars in revenue. As the box office numbers continues to influx, the variables that attribute to box office sales for movie theaters become increasingly more beneficial. Studios are constantly looking for insight into the consumer in order to better support and market films to drive the public to the theater. This study seeks to assess the motivations behind the general public's willingness to spend disposable income at the movie theater. This study will specifically look at the influence of brand recognition and critical reviews on participants inclination to see a film in the movie theater versus streaming the film at a later time for a lower cost. This study is essentially a look at the effect of brand recognition and social proof on the general consumer through the lens of box office numbers and movie trailer marketing. During the study, we will show participants manipulated movie trailers to further understand the influence of film studios as well as varying critical reviews on purchase intent to go to the theater. These results can provide further insight into the influence of brand recognition and loyalty, whether it be for films or other purchasing decisions. The results can be implemented to create more effective marketing materials for films.

74. The Effect of Pet Ownership on Emotional Awareness

Presenter(s): Anja Seng, Shaden Beltran Ibarra, Brenda Salome

Advisor(s): Dr. Austin Lee

This research focuses on the development of emotional intelligence, specifically correlating it to pet ownership. Research indicates that there may be a positive relationship between pet ownership and high levels of emotional intelligence. Human-Animal Interaction (HAI) has been speculated to have a positive correlation, referencing the Human Animal bond which is a "mutually beneficial relationship" that impacts the health and well-being of both people and animals. The positive effects of HAI include reduced anxiety and fear. However, there is a lack of data supported evidence to prove the influence of pet ownership on emotional intelligence, which is why we are focusing on this study. Emotional intelligence (EQ) is broken down into four components: self-awareness. self-management, social awareness and relationship management. The leading hypothesis is that having a pet does in fact increase a person's EQ through the sympathetic and caretaking aspects of raising a pet. Surveys of basic questions such as demographics and what group participants fall into (pet-owners or not pet-owners), in addition to the Schutte Self Report Emotional Intelligence Test (SSEIT) (Schutte et al., 1998) will be disseminated to Chapman students. Through these forms of measure, the data will determine if the hypothesis is correct and, furthemore, if different kinds of pets render different results.

75. Communication and Organizing for Cyberinfrastructure

Presenter(s): Chye Shoong Chin

Advisor(s): Dr. Kerk Kee

Cyberinfrastructure (CI) is a socio-technical system that enables experts from multiple disciplines across the nation to collaborate on research projects using big data. Communication activities play an important role in the creation and development of cyberinfrastructure projects. In this poster, we pursue the research question (RQ): What communication techniques are effective for organizing (such as project collaboration and community building) for cyberinfrastructure? A qualitative analysis of interviews with stakeholders of the cyberinfrastructure community revealed four key points to answer this RQ. By implementing grounded theory research techniques, it was revealed that communication within CI was primarily accomplished through face-to-face communication (FTF) or computer-mediated communication (CMC). By juxtaposing the two dimensions of organizing (project collaboration and community building) and communication (FTF and CMC), we propose a two-by-two model of four quadrants, representing how communication is utilized on the micro (i.e., project) and macro (i.e., community) levels in cyberinfrastructure. The insights provided by interviewees demonstrated the importance of communication in organizing.

76. Organizational Capacity Building: Cyberinfrastructure Organizations Facilitating Interdisciplinary Collaboration in Research

Presenter(s): Cara Cummings

Advisor(s): Dr. Kerk Kee, Andrew Schrock

Specialized CI technologies enable scientists and researchers across disciplines to collaborate, share, store, and manage big data more effectively and strategically in a virtual space. As a vanguard in the field

of computational science, CI technologies help break down barriers in collaborative interdisciplinary research. Interdisciplinary collaboration is dependent on team members to have access to resources and technologies that enable them to organize, communicate and constructively exchange knowledge and ideas in a virtual manner that's not restrictive to geographical or organizational boundaries. What types of CI organizations currently exists to facilitate interdisciplinary collaboration within data-heavy research projects? Three themes emerged from quant. and qual. data collected from interviews with leading scientists and technologists within the CI community. First, Consortia, which is encompasses a group of organizations and networks within the CI community including XSEDE and or national labs or centers that are dispersed throughout the country. This consortium of organizations provides the human infrastructure and loosely organized groups and networks within the CI community. Organizational consortiums provide specialized resources, systems, tools, and computational expertise required for researcher to organize, communicate, and process data in an accessible and virtual manner. Second, facilitator networks such as campus champions, provide organizational assistance to researchers and their team that helps educate and introduce them to CI resources and services available to them to incorporate into their research efforts. Lastly, research computing centers are accessible within and outside of university settings to provide researchers the training and data management and sharing expertise to research projects, specifically they stimulate organizational capacity building for facilitating effective interdisciplinary collaboration for project success.

77. Instructional Communication Needs in the Secondary Classroom: An Exploratory Study

Presenter(s): Sarah Downey
Advisor(s): Dr. Sara LaBelle

The purpose of this study is to identify the communicative needs of secondary education teachers in the United States. In understanding these needs, a research agenda can be created for instructional communication scholars hoping to develop better programs for education in the secondary (K-12) educational context. Though several early instructional communication studies focused on a wide range of participants across what Fredriech and Nussbaum (2005) call the "developmental continuum,"(p. 580) the vast majority of work has centered on the college classroom. The two proposed research questions of this study are an initial attempt to examine communication in the secondary classroom by identifying (RQ1) communication strengths, and (RQ2) communicative weaknesses perceived by current secondary teachers. Using an anonymous online survey, secondary teachers are being recruited through network sampling to answer a series of open-ended questions about communication in their classrooms. Teachers' responses will be analyzed using the principles of grounded theory as a framework (Glaser & Strauss, 1967). This approach will allow meaning to emerge from participant responses, rather than subjecting them to pre-existing frameworks. The results of this study will establish a research agenda to guide future work by instructional communication scholars interested in exploring the processes of teaching and learning at the secondary level. References Friedrich, J. F., & Nussbaum, G. (2005). Instructional/developmental communication: Current theory, research, and future trends. Journal of Communication, 55, 578-593. doi:10.1111/j.1460-2466.2005.tb02686.x Glaser, B. G., & Strauss, A. L. (1967). The discovery of grounded theory: Strategies for qualitative research. Piscataway, NJ: Aldine Transaction.

Oral Presentations- Session I

Thursday, May 2 | 1:30PM-2:30PM

Argyros Forum

AF 209 A

Chemistry

Computational Investigation of the Lewis-Acid Mediated Activation of Sulfonyl Fluorides

Presenter(s): Matthew Nwerem

Advisor(s): Dr. Maduka Ogba

Since the early 20th century, nitrogen-containing sulfur (VI) compounds such as sulfonamides have been synthesized via either the oxidation of thiols or the substitution of sulfonyl chlorides. The prior method occurs under harsh conditions which limit the functional group compatibility. Moreover, sulfonyl chlorides are thermodynamically unstable and are susceptible to hydrolysis and redox reactions. Sulfonyl fluorides have emerged as promising alternatives to sulfonyl chlorides in the synthesis of sulfonamides. A recent study by Ball and coworkers has reported the use of stoichiometric calcium triflimide in the activation of sulfonyl fluorides; however, the mechanism of this process is unknown. The goal of my project is to use computational techniques to (1) elucidate the calcium complex responsible for the S-F bond activation, (2) investigate the mechanism of the reaction, and (3) provide rationale behind the use of a stoichiometric amount of calcium salt. The thermodynamic stabilities of various Ca2+ complexes and hypotheses for S-F bond activation will be presented.

Computational Science

Deep Convolutional Neural Networks for Classification of Cancer Driver Mutations

Presenter(s): Steven Agajanian, Oluyemi Odeyemi, Hamilton Pitlik, Caitlyn Chavez

Advisor(S): Dr. Gennady Verkhivker

Determining whether a point mutation is a driver or a passenger is a difficult problem involving the extremely complex ecosystem of the body, and all of the possible interactions it might have with a particular nucleotide. It is often required that the problem be looked at on a smaller scale to be able to solve it in a tractable manner. Supervised machine learning allows the reuse of some of the work that has already been done in the field to infer the answer for unclassified mutations in an effective manner. Previously, we performed an experiment where precomputed functional and evolutionary features were successfully used to perform this classification. In this experiment we used a convolutional neural network architecture to convolve around two nucleotide strings and determine whether a mutation would contribute in a meaningful way to the onset of cancer. Various architectures and preprocessing techniques were used to attempt to perform this task. While nucleotide information alone was unable to classify accurately, it provided significant informational content that was complementary to the functional features. We then integrated the DNA based scores generated by the convolutional neural networks with various categories of conservational evolutionary and functional features into a generalized random forest classifier. The results of this study have demonstrated that convolutional neural networks can learn high level features from genomic information that are complementary to the ensemble-based predictors often employed for classification of cancer mutations. By combining deep learning generated scores with the

two main ensemble-based function features, we can achieve a very good performance of various machine learning classifiers. Our findings have also suggested that the synergy of nucleotide based deep learning scores and integrated metrics derived from protein sequence conservation scores can allow for robust classification of cancer driver mutations with a limited number of highly informative features.

Health Sciences and Kinesiology

Community Presentations Using 3D Printed Anatomical Models on Knee Injury Prevention

Presenter(s): Kinnera Reddy
Advisor(s): Dr. Caroline Wilson

Knee injuries such as anterior cruciate ligament (ACL) and meniscus tears are common but can be prevented if risk factors and prevention exercises are learned. In order to inform the public about knee injury prevention, a project was designed utilizing 3D printed knee models that show various injuries. In collaboration with Chapman's Academic Service Learning coordinator, presentations were organized for local high school students to highlight best practices. This research project largely comprised of a literature review identifying the effectiveness of 3D models in teaching anatomy and details on the anatomy of ACL and meniscus tears, followed by the creation of the 3D models. While the presentations are scheduled to take place in April 2019, they will include a Kahoot, an interactive online game, which will be used to test the prior knowledge of the audience. Next, a 3D knee model demonstration using rubber bands to simulate the ligaments of the knee will be presented as a fun, interactive way to illustrate knee anatomy. An active component requiring the audience to participate in ACL-tear prevention exercises will also be included in hopes that they will incorporate the exercises into their own daily lives. This work can be used for future studies that identify best practices in using 3D knee models to help teach anatomy and injury prevention

Oral Presentations- Session I

Thursday, May 2 -1:30PM-2:30PM

Argyros Forum 209 ABC

AF 209 C

Art

I'm Tired

Artist: Elle Chapman

Advisor(s): Micol Hebron

"I'm Tired" is a digital designed social justice poster made with photoshop that is 18 X 24. This poster is modeled after the artwork and social movement of co-creators Paula Akpan and Harriet Evans. They used Facebook, Twitter, Tumblr and Instagram to share photos of what participants are most tired of, which is displayed across their bare backs, allowing for a positive space in which people can share their own stories. For my rendition of this project, I photographed an anonymous friend of mine who has suffered sexual abuse, and photoshopped words taken from a participant from the "I'm Tired" project. On her back it says, "I'm tired of having to justify breaking her expectations". I chose this statement as she found that in embodies what she felt when she suffered sexual abuse. She was in a situation with a man where she felt like she "owed" him sex. I chose to make this piece as I have suffered from sexual assault and wanted to bring the topic into the light.

Peace Studies

The Effects of Female-Targeted Healthcare on Female Enrollment in Higher Education: India

Presenter(s): Natalie Kowel

Advisor(s): Dr. Lisa Leitz

Women's empowerment has been a buzzword to the academic and NGO-world for the past century. Every scholar, program, and agency has their own definition of female empowerment. But the big question of postmodern academics is, "how do you measure empowerment?" Through the research available, there seems to be two very important factors that play into "empowering" an individual or community: health and education. When one researches the effects health and education have on female empowerment, there is always a direct linkage between education and health, with better education being the prerequisite to better health. There is little research however, showing a causal linkage in the opposite direction: better health being the precursor to better educational outcomes. In the following research study, data will be collected from two regions in India that have had extensive health reform, including multiple health interventions by governmental and non-governmental health agencies. Women's enrollment in higher education will be tracked from 1985 to 2015 in 3-5 year intervals, looking at female enrollment before and female enrollment after those specific female-targeted health programs. Testing both empowerment theory, as well as Maslow's theory of Basic Needs, it is hypothesized that women in India will have higher tertiary education/higher education enrollment rates after the women's health programs have been implemented.

Oral Presentations- Session I

Thursday, May 2 -1:30PM-2:30PM

Argyros Forum 209 ABC

Psychology

The Formation of Queer Consciousness in Gay, Latin, Men: How Experiences Affect the Lives of Queer Latinos

Presenter(s): Daniel Leon-Barranco

Advisor(s): Dr. Miguel Zavala

This research was the product of my coursework in the First-Year Foundation Course, Histories of Consciousness. The research I carried out began from the puzzle: How does experience, in a Latinx environment, affect the "coming out" process for Latinx men. This puzzle was the results of my own experience and is the basis for my autoethnography. This research is a form of introspection that I carried out with the intention of discovering where my queer consciousness was formulated and developed. The beginning of my research, I deducted that this consciousness began from my experiences in a Latinx household; from then on, I have fleshed out my project with help from the works of Sandra Harding on Standpoint theory, Cindy Cruz's thoughts on the epistemology of Xicanas, and the research conducted by Katie Acosta on queer, Xicanas.

Oral Presentations- Session II

Thursday, May 2 -3:00PM-4:00PM

Argyros Forum 209 ABC

AF 209 A

Biochemistry and Molecular Biology

Biophysical Characterization of CowN from Gluconacetobacter Diazotrophicus

Presenter(s): Kevin Bretzing

Advisor(s): Dr. Cedric Owens, Michael Medina

Gluconacetobacter diazotrophicus is a nitrogen fixing bacterium that is associated with plants and plays a crucial part in providing fixed nitrogen to many crops such as sugar cane. The enzyme responsible for reducing atmospheric nitrogen to ammonia is nitrogenase. The presence of carbon monoxide gas will inhibit nitrogen fixation by nitrogenase. While nitrogenase in vitro is inhibited, diazotrophs may have a mechanism of protecting nitrogenase in vivo. It is believed that a protein contained in diazotrophs, CowN, protects the nitrogenase from the detrimental effects of carbon monoxide. The overall goal of this research is to better understand how CowN shields the nitrogenase from carbon monoxide. Particularly, we are interested in understanding the structure and biophysical properties of CowN and whether it interacts directly with nitrogenase. Here, we will describe the purification of CowN and its biophysical characterization. Following expression of the CowN gene in E. coli and purification by affinity and size exclusion chromatography, samples of CowN can be found in two different states; monomeric and oligomeric. The functional importance of the two oligomeric states and the interconversion mechanism is unknown. CowN contains a cysteine residue which can form disulfide bridges with other cysteine residues. We determined that reducing the disulfide results in greater amounts of monomer, suggesting that disulfide bond formation and oligomerization may be related. Furthermore, we found that a CowN variant that has its cysteine mutated to a serine also predominantly forms a monomer. However, oligomer still is present, suggesting oligomerization is not entirely dependent on disulfide bond oxidation. Therefore, we are exploring other factors that may cause the change in oligomeric state of CowN such as temperature, salt concentration and pH. We characterize the change in oligomeric state by using dynamic light scattering, size exclusion chromatography and circular dichroism spectroscopy. The results of these experiments will be discussed in the presentation.

Chemistry

Computational Investigation of the Mechanism of Cysteine Oxidation by Bleach (HOCl) in the Zinc-Binding Core of Cystolic Chemoreceptor Transducer-Like Protein D (TlpD)

Presenter(s): Lindsay Zumwalt

Advisor(s): Dr. Maduka Ogb

About half of the world's population is affected by a single pathogen; Helicobacter pylori. This pathogen is known to cause gastritis, stomach ulcers, and stomach cancer. Rather than being eradicated by reactive oxygen species (such as HOCl), H. pylori is attracted to the source through a chemotaxis swimming response resulting in more effective colonization. Previous mutation studies have indicated that

transducer-like protein D (TlpD) is responsible for the chemoattractant response and efficient colonization. Within TlpD is a chemoreceptor zinc binding (CZB) site consisting of a Zn2+ coordinating with three histidine (His) and one cysteine (Cys) residues. HOCl reversibly oxidizes the cysteine resulting in chemotaxis. Our understanding of this oxidation process is still in its infancy. The goal of this project is to use computations to uncover the mechanism of HOCl-mediated cysteine oxidation within the Zn-binding core of TlpD. Three models were used to systematically probe the effect of TlpD on the HOCl-mediated oxidation pathway: (i) methanethiol (CH3SH) only, (ii) CH3SH bound to a Zn-complex comprised of Zn2+ and three imidazoles – the first coordination sphere model, and (iii) model system in (ii) but now including surrounding amino acid residues – the second coordination sphere model. Both one-electron and two-electron pathways are currently being investigated. Various sulfur protonation states, oxidant protonation states, sulfur ionization states, and the impact of zinc on the thermodynamics of this oxidation are being investigated. Insights from computations will be presented.

Pharmacy

Viral Factors Influencing Plasmablast Proliferation/Differentiation in Early B lymphocyte Infection with KSHV

Presenter(s): Romina Nabiee
Advisor(s): Dr. Jennifer Totonchy

KSHV is the etiologic causative of Multicentric Castleman Disease (MCD). One well-established result of MCD is infected plasmablasts, which are present in patients' lymph nodes and spleens. Reports have shown that these plasmablasts increase in number and coalescence to form variably sized aggregates both within and outside of the germinal centers of infected lymph nodes and spleens. However, these plasmablasts do not present somatic hypermutations, which suggests they are derived from naive B cells that have undergone extrafollicular differentiation. One of the factors that is known to have a pivotal role in the pathogenesis of MCD is KSHV conserved protein K2 (Viral Interleukin-6). K2 levels are detectable in systemic circulation and its levels directly correlate with disease progression. It has been shown in in-vitro studies using non-primary cells that deletion of K2 leads to higher expression levels of ORF11, which is a highly conserved gamma herpes virus tegument protein. This suggests a possible co-regulation in the lytic cascade. Both of these proteins are known to be early lytic markers, which peak approximately 36 hours post-infection, thus making them important factors influencing the early infection with KSHV. We have performed loss of function studies via de novo infection of primary B lymphocytes from human tonsil specimens with recombinant BAC16 KSHV lacking ORF11 (KSHV-Δ11) and BAC16 KSHV lacking K2 (KSHV-ΔK2) to study the early B lymphocyte infection processes compared to KSHV-WT. Our loss-of-function studies have revealed that while KSHV-Δ11 targets Plasmablast cells and increases their proliferation levels, KSHV-ΔK2 decreases the Plasmablast differentiation. Conclusively, our data suggests that ORF11 and K2 may play a crucial regulatory role in differentiation and/or proliferation of Plasmablasts, in early infection with KSHV.

Oral Presentations- Session II

Thursday, May 2 | 3:00PM-4:00PM

Argyros Forum

AF 209 B

Computational Science

Development of Cancer-Specific Deep Learning Predictive Model for Classification Pathogenic Mutations in Human Genome

Presenter(s): Oluyemi Odeyemi, Steve Agajanian, Caitlyn Chavez, Hamilton Pitlik

Advisor(s): Dr. Gennady Verkhivker

Cancer arises from accumulation of somatic mutations and genetic alterations in cell division checkpoints and apoptosis, this often leads to abnormal tumor proliferation. Proper identification and classification of driver-passenger mutations will considerably help our understanding of the molecular dynamics of cancer. In this study, we build on cancer-specific deep learning predictive model to identify driver-passenger mutation as a function of a sequence of deoxynucleic acid nucleotide. A comparative analysis was conducted using traditional machine learning classifiers logit (baseline), random forest, support vector machine and deep learning classifiers recurrent neural networks and long short-term memory. Due to the complexity and sequential nature of the nucleotides, the data was processed and vectorized using one-hot encoding and the seq2vec representation before inputting in the model. The data was partitioned into four pairs of train and test. We used 10-fold cross validation to prevent overfitting by the classifiers and as a further precaution, we used a drop out layer in the recurrent neural network and long short-term memory deep learning architectures. Due to the binary nature of the mutation class, we used the receiver operating characteristics curve for model evaluation and log loss function for the error component assessment From the results, recurrent neural network, long short-term memory, random forest, radial basis function support vector machine classifiers outperformed the baseline classifier. The recurrent neural network and long short-term memory deep learning classifiers were better at passenger-driver gene discrimination/prediction than traditional machine learning classifiers. The combination of long short-term memory deep learning architectures with recent advances in next generation sequencing will further expand the frontiers of cancer therapy.

Peace Studies

Cultural Perceptions of Performing Arts Careers: A Look at Career Access in America and a Discussion of Diversity

Presenter(s): Jackie Palacios

Advisor(s): Dr. Lisa Leitz

When we talk about diversifying certain fields of study, we usually mean adding more perspectives to the table; the perspectives of people of color, immigrants, LGBTQIA+, and other minoritized identities, in order to have an inclusive dialogue and strive toward an inclusive workplace and a diverse world. However, when we talk about this diversity we often overlook the fact that some careers have different perceptions attached to them, some careers might have higher salaries, a steady income, while others, may be looked down upon. So, how do we diversify fields that people have negative perceptions about?

How do we diversify fields when parents, and sometimes whole cultures, are condemning these fields as viable career paths? What does it mean if people from different cultures are not given the opportunities to pursue these careers? With the recent rise in representation in mainstream media, have we seen an increase of people of diverse backgrounds now pursuing a career in the performing arts? In my research I ask, how do certain cultures perceptions of pursuing the performing arts as a career affect their participation in performing arts careers? I will be examining existing literature and my own survey results with hopes to understand and strategize new ways to address diversity and representation.

AF 209 C

Art

Representation

Artist: Kara Bass

Advisor(s): Suzanne Wright

These pieces were submitted for my final for my Drawing and Planning course, in which the prompt was to create a series of pieces about a topic that you care about deeply. My goal as an artist is, and always has been, to create more representation in children's television shows in terms of race so that every child can see a bit of themselves portrayed as a hero. The first piece is "Yellowface", a mockery of a Hollywood poster starring Mickey Rooney as his role in Breakfast at Tiffany's and Scarlett Johansson as her role in Ghost in the Shell, where both white actors from two entirely separate eras accepted roles to be portrayed as an Asian actor and therefore contribute to erasure. The second piece is "The Others", depicting nine individuals meant to represent the stereotypes that people of color are forced to play, as they are usually the only options for a role. The background is a faded urban setting, intended not to catch the eye of the viewer or demand attention, a statement to how people of color are asked to behave when they demand representation in Hollywood. The final piece is "Two Truths and a Lie", meant to show how LGBT couples are versus how they are seen. The first two subjects are supposed to be the truths, with two old hands without wedding rings, and a teenager scared on the side of their bed as they realize their true identity. The bottom part of the piece, meant to be the lie, is a still from 13 Reasons Why, in which one of their four gay characters beats up his boyfriend in a fit of rage, followed by an immediate make-up scene.

Social Justice Poster: Animal Testing

Artist: Grace Hill

Advisor(s): Micol Hebron

This is a digital social justice poster that depicts the issue of animal testing with the stylist influence of Chinese communist propaganda posters. The digital poster is 18 x 24, created on Photoshop. The medium of the poster is a digital inkjet print The style of the poster was influenced by Chinese communist propaganda posters during 1976. The subject within the poster is commenting on the issue of animal testing and the animal testing industry. I chose this topic because using vegan and/or non-animal tested cosmetics has been something on my mind lately. And something I have been actively trying to stop supporting and cut out of my life. I wanted to depict the issue of capitalism behind animal testing, through

placing the bunny in a high place as if showing the bunny on a pedestal. I used the character of a bunny or rabbit because when thinking of the issue of animal testing this animal comes to mind first. I sketched the bunny on photoshop and then placed a red star with dripping "blood" over the eye, to bring attention to the issue of testing products on animal eyes. I used black to sketch the bunny to create contrast and draw the eye to the bunny. I used red as the main color of the rest of the poster paralleling the communist time period. I used white rays and a large circle against the red background to create a focal point. I then added text to the bottom of the poster says "Stop Animal Testing".

Film

The White Man's Burden and the Effects of Apologetic Othering in Cinema

Presenter(s): Keshav Srinivasan

Advisor(s): Dr. Kelli Fuery

The term "othering" brings forth images of people of color depicted as violent savages and marauders. However, there is a different, more modern form of othering-one that damages the portrayal of minorities in cinema in its own unique way. This concept, termed, as "apologetic othering", positions people of color only in relation to historical atrocities committed by white collectives. As a result, the individuality of these minorities is reduced, simplifying them into symbols of injustice. This presentation explores this phenomenon and how it has grown and progressed over the years, looking at classic cinema like Walkabout and Apocalypse Now, all the way to the postmodern Dead Man. Within these films, I will look at the portrayal of indigenous characters and how they stand in service of a white protagonist's spiritual journey. Rudyard Kipling's The White Man's Burden further correlates perspectives on classical and modern forms of othering. It is through this comparison in which we learn how inextricably linked modern and classic cinema can be in terms of their portrayal of minorities. The treatment of minorities in film has progressed while also bringing upon a new set of issues that need to be addressed. Through proper representation that establishes people of color as individuals rather than symbols, filmmakers can realize that true progression requires looking beyond the past.

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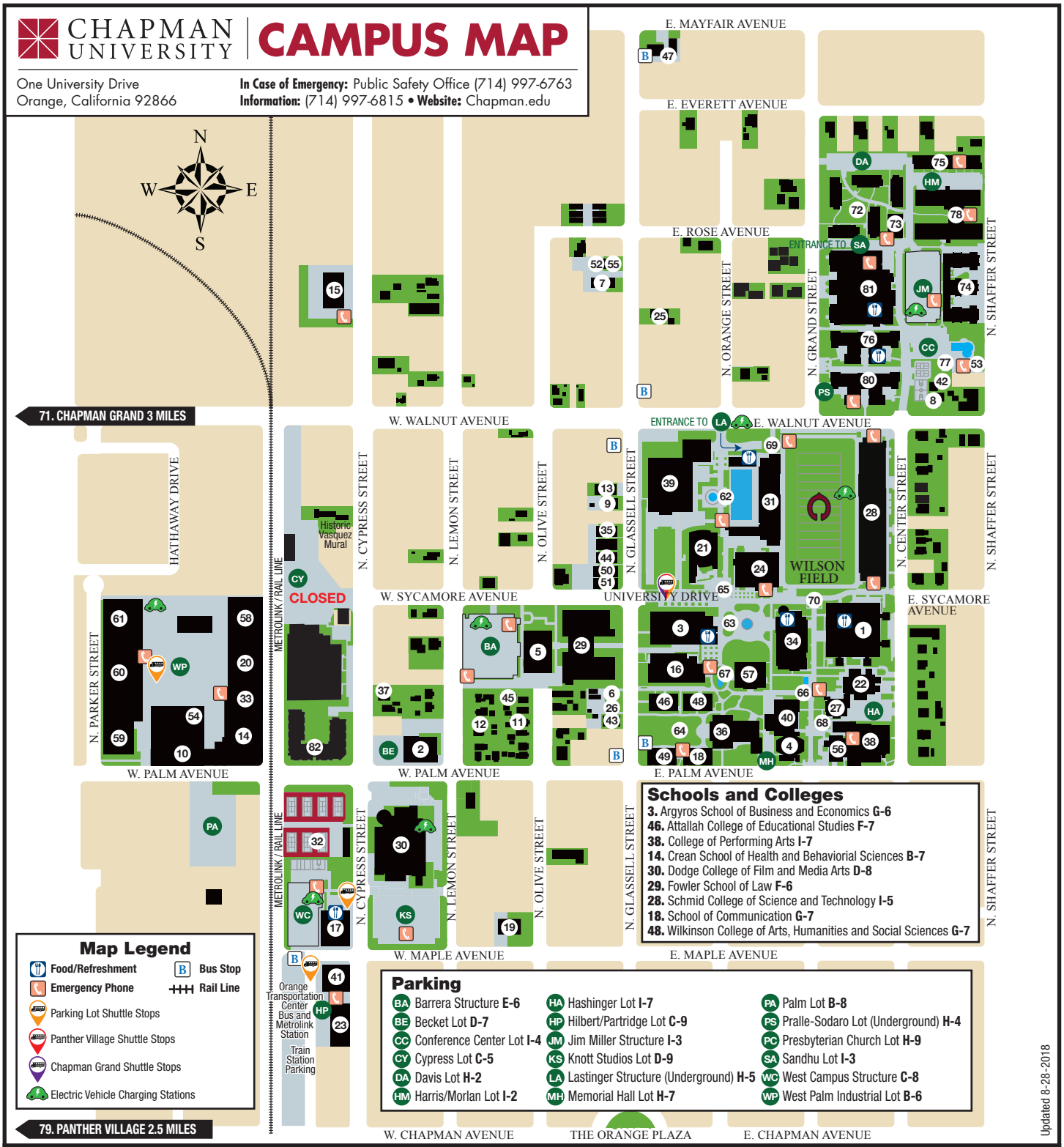
CHAPMAN UNIVERSITY | CAMPUS MAP

One University Drive
Orange, California 92866

In Case of Emergency: Public Safety Office (714) 997-6763
Information: (714) 997-6815 • **Website:** Chapman.edu



Map Legend

- Food/Refreshment
- Emergency Phone
- Parking Lot Shuttle Stops
- Panther Village Shuttle Stops
- Chapman Grand Shuttle Stops
- Electric Vehicle Charging Stations
- Bus Stop
- Rail Line

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46. Attallah College of Educational Studies **F-7**
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14. Crean School of Health and Behavioral Sciences **B-7**
30. Dodge College of Film and Media Arts **D-8**
29. Fowler School of Law **F-6**
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- **BE** Becket Lot **D-7**
- **CC** Conference Center Lot **I-4**
- **CY** Cypress Lot **C-5**
- **DA** Davis Lot **H-2**
- **HM** Harris/Morlan Lot **I-2**
- **HA** Hashinger Lot **I-7**
- **HP** Hilbert/Partridge Lot **C-9**
- **JM** Jim Miller Structure **I-3**
- **KS** Knott Studios Lot **D-9**
- **LA** Lastinger Structure (Underground) **H-5**
- **MH** Memorial Hall Lot **H-7**
- **PA** Palm Lot **B-8**
- **PS** Pralle-Sodaro Lot (Underground) **H-4**
- **PC** Presbyterian Church Lot **H-9**
- **SA** Sandhu Lot **I-3**
- **WC** West Campus Structure **C-8**
- **WP** West Palm Industrial Lot **B-6**

Updated 8-28-2018

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2. Becket Building **D-7**
3. Beckman Hall **G-6**
4. Bertea Hall **H-7**
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12. Conference Services, Event Scheduling, and Ticket Office **E-7**
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14. Crean Hall **B-7**
15. Cypress Street Schoolhouse **C-3**
16. DeMille Hall **G-6**
17. Digital Media Arts Center **C-9**
18. Doti Hall **G-7**
19. Elliott Alumni House **E-9**
20. Entertainment Tech. Center **B-6**
21. Fish Interfaith Center **G-5**
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23. Hilbert Museum **C-10**
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25. Institute for Interdisciplinary Brain and Behavioral Sciences **F-3**
26. Institute for the Study of Religion, Economics & Society **F-7**
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77. Masson Beach Club **I-4**
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Chapman is a smoke-free campus including parking lots

Notes

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