



Student Research Conference

Online Oral Abstract

Wednesday, February 16, 2022

➤ **Natural Sciences**

Natural Sciences

Michelle Mohr, Graduate Student

Tree - Ring Growth Response of Pinus Ponderosa (PIPO) to Climatic Variability in Prescott National Forest, Arizona

Faculty Mentor: Parveen Chhetri, Earth Sciences

Warming temperatures across the Southwestern U.S. have posed a significant threat to the future of our forest ecosystems. Climate change has altered forest populations around the globe, with a record-breaking fire season currently taking place across the Southwestern U.S. An increase in fire activity, season length, and intensity in the region has been attributed to an extended dry spell that has produced some of the hottest days on record. Trees across the region are responding to these extended periods of aridity with high mortality rates, as well as changing annual radial growth patterns. To understand how detrimental these extreme conditions have been to the forest ecosystem, study plots were established in Prescott National Forest, Arizona, to collect tree-ring cores. These cores were analyzed using the standard dendrochronology procedures of collection, measurement, cross dating, and statistical analysis in order to determine the impact that severe droughts have had on the Ponderosa pine (*Pinus ponderosa*) population of the Southwest. Dendrochronology has long been used to understand forest dynamics, therefore using tree rings from Ponderosa pine (PIPO), one of the most populous tree species in the American Southwest, we can understand how this unprecedented era of climate change has impacted radial growth and the ultimate longevity of forest productivity.

Stacy Zamora, Graduate Student

Neurobiological Correlates of Substance Use Disorder: Disrupted Δ FosB protein expression in the PFC and NAc of Ethanol and Cocaine-Exposed Male and Female Rats

Faculty Mentor: Philip Viera, Psychology

Substance Use Disorder (SUD) is a chronic relapsing disease associated with long-lasting neurobiological alterations in the brain's mesolimbic reward pathway. In particular, alcohol is widely abused throughout the world, attributing to 3 million deaths a year, an increased societal financial burden, and poor health outcomes in alcoholics. Additionally, the rate of cocaine abuse, has been rising in the USA, creating an economic and healthcare burden. The exact mechanisms behind SUD are still being investigated. However, as sex differences in SUD expression exist, it is of importance to determine the interaction of molecular factors with biological sex. To understand the pathogenesis of SUD, we focused on a neuronal transcription factor implicated in drug abuse called Δ FosB. Ongoing research has shown that Δ FosB is involved in long lasting alterations of neural pathways that support the chronic and relapsing nature of SUD. We focused on two subregions of the reward pathway, the prefrontal cortex (PFC) and the nucleus accumbens (NAc). To measure Δ FosB, we first obtained brain tissue from adult male and female Sprague-Dawley rats that were exposed to cocaine under four different conditions: control (saline), acute intoxication, short-term withdrawal, and long-term withdrawal. We isolated two subregions of the reward pathway, the prefrontal cortex (PFC) and the nucleus accumbens (NAc), by taking 50 μ m coronal sections of the brain. We then performed immunohistochemistry on these sections to label neurons possessing Δ FosB. Sections were then imaged under epifluorescent microscopy and automated cell counting was performed on the images taken using ImageJ. In each group, the number of Δ FosB -positive neurons was assessed within the ventrolateral PFC, ventromedial PFC, and the NAc. When performing a single factor ANOVA, we observed a difference in the amount of Δ FosB -positive cells in all experimental groups ($p = 0.05$). Additionally, when comparing the amount of Δ FosB - positive cells in the regions themselves, there was a statistical difference observed only in the ventromedial PFC ($p < 0.01$). Post Hoc testing was performed and confirmed statistical differences for amount of Δ FosB -positive cells in the ventromedial PFC. These preliminary results indicate that there is an association between cocaine use and the amount of Δ FosB present in the mesolimbic pathway. Further analysis will be performed to compare sex differences in the number of Δ FosB -positive cells in the different treatment groups. Overall, these new insights can lead into possible treatments that target transcription factors in those suffering from SUD.

Shinaola Agbade, Graduate Student

Efficient Greedy Algorithm for Virtual Network Function Placement

Faculty Mentor: Bin Tan, Computer Science

Recent advances in virtualization have allowed for networking solutions to be far more scalable than traditional solutions which were widely in use. These solutions required the use of middleboxes in order to implement network function. With virtualization, these solutions, termed virtual network functions, are much more cost effective relative to traditional middleboxes.

Placement of virtualized network functions within a fat tree data center topology is useful in today's technological climate as more network functions are becoming virtualized, thanks to containerization. In this study, a greedy virtual network function placement method is proposed and compared to the previously established random placement. It is observed that the total cost of the greedy method has been less than the random placement and that the performance improves as the amount of placement increases relative to random placement. This can be attributed to the greedy method always choosing the location which results in the lowest possible amount of hops. When paired with the communication frequencies of the pairs, it will guarantee that the total cost of the greedy placement will be either equal to or less than the random placement of the VNF. While the greedy placement of the VNF within a fat tree topology was investigated, it would be interesting to see the performance of both approaches with other proposed topologies.

Sterling Abrahams, Graduate Student

SAM: Maximizing Service Function Chain Availability in Cloud Data Centers

Faculty Mentor: Bin Tang, Computer Science

Service function chaining (SFC), which consists of a sequence of virtual network functions (VNFs), provides effective and flexible network service management in a cloud computing environment. Due to the vulnerabilities of software-implemented VNFs, existing research has introduced VNF backup servers to achieve the fault-tolerance of VNFs and to improve the availability of SFCs. However, they either do not consider the failures of backup servers or do not aim to maximize the availability of the entire SFC. In this paper, we study how to maximize the availability of an SFC considering that both VNFs and backup servers can fail. We refer to the problem as SAM: service function chaining availability maximization problem. Given an SFC and a set of backup servers placed inside a cloud data center network, the failure probabilities of the VNFs and the backup servers, the goal of SAM is to assign backup servers to VNFs to maximize the availability of the SFC while satisfying the backup capacity constraint of the servers. We design a suite of optimal and efficient algorithms to solve SAM. Via extensive simulations with different network parameters, we show that our work outperforms the existing research by up to 21.7%, demonstrating the effectiveness of our algorithms in achieving high SFC availability in cloud data centers.



Student Research Conference

In-Person Abstracts

Wednesday, February 16, 2022

- Behavioral and Social Sciences
- Natural Sciences
- Health, Nutrition, and Clinical Sciences

Behavioral and Social Sciences

Bianca Hunter, Graduate Student

Reducing Homelessness in Los Angeles County: Policy Strategies for Housing First

Faculty Mentor: Rui Sun, Public Administration

There are numerous underlying causes that contribute to homelessness, including, mental illness, substance abuse, cost of living and limited affordable housing. These causes have led to a dramatic increase in the homeless population over the years, The county of Los Angeles currently holds a total of 66,436 homeless persons in Los Angeles County (LAHSA, 2020). Homelessness is a wicked problem that requires meaningful solutions, and policies that can help prevent the issue from growing. Homelessness is an issue that does not necessarily have a “root cause” since there are several contributing factors, for this reason, there can be no single approach to a resolution. It is an issue that is never fully solved but repeatedly re-solved and requires government and nongovernment collaboration to find a meaningful and lasting solution. In recent years, the 'Housing First' policy has been implemented to aid in the reduction in homelessness in Los Angeles County. Housing First is a model that allows for placement into permanent housing, a non-treatment first focused approach. The model assumes that individuals can focus on barriers that contributed to homelessness once they are housed. While studies have shown that Housing First is capable of short-term housing retention, it does not directly address mental illness, addiction, and affordability to sustain long-term. The following provides three research-informed policy proposals for improving Housing First.

Edward Cruz, Graduate Student

Social Mobility and Income Inequalities: Work opportunities, working conditions, and fair wages

Faculty Mentor: Rui Sun, Public Administration

While the standard of living has increased due to phenomena such as Globalization and the Fourth Industrial Revolution, so have the disparities and inequalities. Individuals who face such inequalities experience challenges in social mobility. Social mobility is described as the ability for individuals in a society to achieve their full potential regardless of origin and background. Though, research indicates most societies are unable to provide conditions which allow individuals to achieve their full potential as socio-economic backgrounds influence an individual's social mobility. For example, the top 1% of income earners has seen a 158% increase since 1979 while the bottom 90% has only seen a 24% increase in income. Such outcomes affect an individual's outlook which may affect the economic growth of society. The three areas of importance include work opportunities, fair wages, and working conditions. Work opportunities are measured through unemployment levels, corresponding level of education with the unemployed, and demographics of the labor force. Fair wages are measured through incidence of low pay, adjusted labor income share, and various comparisons between top and bottom income earners. Working conditions considers number of hours worked per week, employee-employer relations, and workers' rights. This research study uses regression analysis to understand the importance of work opportunities, fair wages, and working conditions and their relationship to income inequality. This study uses International Labour Organization data.

Lamiya Hoque, Graduate Student
Public School Leadership During a Pandemic
Faculty Mentor: Rui Sun, Public Administration

The reality of COVID-19 has required schools to become more aware of the financial and resource disparities among school districts and among students. The board of education for each school district operates to serve the different wants and needs of their constituents. This study examines different leadership styles exhibited during the COVID-19 pandemic through three case studies. Leadership styles may be distinguished as the following: (1) Instructional Style, (2) Structuring Style, (3) Participative Style, (4) Entrepreneurial Style, and (5) Personnel Development Style. Specifically, the research questions are: (1) What types of leadership styles have exhibited at school district boards during COVID-19? (2) What factors have influenced the decisions of school district leaders? (3) How do different leadership styles of the district boards affect teacher engagement and student learning during COVID-19? Based on the interviews with the board members of these school districts in California, USA, the study anticipates that distinctive leadership styles lead to specific program development. The findings will contribute to the public administration literature and provide valuable resources for academic leaders.

Nate Hertweck, Graduate Student
Tragicomedy of Errors: Colonial Oppression, Conversion, and Martyrdom in The Island Princess and Beyond
Faculty Mentor: Kimberly Huth, English

For all of Western colonialism's conquests, perhaps the most transformative, deep-rooted, and enduring spoil of war is the generational collection of converted Christian souls. As Seventeenth Century Europeans began to expand their efforts to exploit resources, claim land, conquer civilizations, and impose their God-given religion the world over, Early Modern England was forming what would become the British Empire, and their attitudes toward the Eastern world and its people were driven by religious superiority. The spiritual and cultural damage was cataclysmic, widespread, and lasting, begging the question of how Christianity has thrived into the modern era in postcolonial cultures while other vestiges of colonialism have been duly condemned. A look at how this Western religious superiority plays out in the generalized Eastern world of John Fletcher's 1621 tragicomedy *The Island Princess* provides a historical glimpse into English attitudes of religious conversion, martyrdom, and dominance. Additionally, Thomas Hobbes's concept of the "Common-Wealth" and "perpetual war" in *Leviathan* can connect the religious aspects of colonialism represented in *The Island Princess* with the targeting of both bodies and souls simultaneously in the practice of proselytization. In the play's world and in our modern world, religion is a vehicle for power, and colonial peacemaking is merely a byproduct of victory and expression of prosperity on European terms. Specifically, the play's pair of pivotal apostate moments—the strong European Armusia's rejection of Islam and the changeable title character Quisara's conversion to Christianity—portray Early Modern English positions on religious conversion and martyrdom. Enabled further by the shifty moral ground and dangerous power hybrids of tragicomedy, this 400-year-old play's genre, action, and commentary predict Western colonialism's lasting legacy of religious oppression and teach us about the methods behind the modern stronghold of Western religious supremacy in postcolonial cultures.

Jasmine Hannani, Jessica Chan, Rachel Garcia, Kayla English, Graduate Student

The Lived Experiences of Neurotypical Individuals with Autistic Siblings: Occupational Participation and Balance

Faculty Mentor: Sheryl Ryan, Occupational Therapy

Families with autistic children face unique challenges that have the potential to influence the occupations of neurotypical (NT) siblings. The purpose of this study was to gain a better understanding of the occupations and occupational balance of NT children during their childhood, based on their adult reflections of growing up in neurodiverse families. Method: This study was a qualitative, narrative study that utilized interviews to obtain reflections from five adult NT siblings. Results: Data analysis generated several themes: family dynamics, hesitancy to acknowledge ASD, independent engagement in occupations, a different normal, and inclusion. Implications: Occupational therapy can support neurodiverse families by providing parent education and compensatory strategies to address the needs of all family members. In addition, due to societal stigma toward neurodiverse individuals, there is a need for more advocacy, education, and full inclusion of this population.

Stephen Wong, Mallory Sheldon, John Stokes, Sarah Taylor, Graduate Student

Understanding Social Participation Among the Previously Incarcerated Population: A Narrative Study

Faculty Mentor: Sheryl Ryan, Occupational Therapy

Objective: Formerly incarcerated individuals face many difficulties with reintegrating into society which is exacerbated by the lack of resources supporting social skills. This study sought to understand how prison affected social participation for previously imprisoned individuals. Method: Utilizing a qualitative approach, the researchers collected individual narratives by conducting interviews with 2 participants recruited from a community-based program (CBP). Researchers analyzed the interview transcripts by coding common themes on how social participation changed over time. Results: Participants struggled post-incarceration but involvement in CBP services provided them with the resources needed to reintegrate back into society. Implications: This study shows that CBP services can aid previously imprisoned individuals with life after prison. Particularly, how CBPs can support the occupation of social participation which can benefit many other aspects of an individual's life.

Natural Sciences

Gabriel Angulo, Graduate Student

Using Maxent Species Distribution Modeling to Project Suitable Habitat of Ponderosa Pine in Arizona

Faculty Mentor: Parveen Chhetri, Earth Science

The structure and dynamics of the forest ecosystem are responding to global climate change. Patterns observed include high tree mortality and changing radial growth patterns in dry southwestern United States. Ponderosa Pine (*Pinus ponderosa*) is a significant timber species and understanding of its distribution is vital. Maxent species distribution modeling is an approach that utilizes species occurrence and environmental data to predict suitable habitats. This study used environmental layers gathered from worldclim.org and species occurrence data for Ponderosa pine in Arizona collected from fieldwork and published literature. The environmental data were based on Coupled Model Intercomparison Projects (CIMP). These climate models were featured in this past 2021 IPCC sixth assessment report (A6). The CIMP6 models contain projections for the years 2021 to 2040. Using these climate models for predicting suitable habitats will aid in the understanding of the future changes to the forest ecosystem in the United States. This study will also highlight the data preparation needed to utilize CIMP6 climatic variables using Geographic Information Systems (GIS).

David Saldana, Graduate Student

Dendrochronological investigations of Pinus jeffreyi in San Jacinto Mountain.

Faculty Mentor: Parveen Chhetri, Earth Science

Over the past century we have observed global temperatures rise as a result of anthropogenic activities. Due to this change the spatiotemporal effects of droughts have increased as natural hazard. The purpose of this study to understand the changing response of California mixed conifer forests to the ongoing effects of a changing climate. To close this research gap, we have selected of Jeffrey Pine (*Pinus jeffreyi*). As one of the most abundant species in the transverse cismontane regions its spatial distribution is within the bounds of various ecotones along the elevation gradient. By analyzing its radial growth by comparing Basil Area Increment (BAI) and Ring Width Index (RWI) we hope to understand the nature of past drought events and help predict future events. Tree cores were collected from three elevation belts – lower (1000 – 2000 m), middle (2000 – 3000 m), and upper (3000+ m). Cores processed using standard dendrochronological methods. Ring width was measured with the Velmex tree-ring measurement system and software (J2X). Visual cross dating and statistical tests (COFETCHA, ARSTAN, treeclim, bootres, and dplR) were used to remove age related noise. Findings from this study will help forest managers and the United States Forest Service manage the changing southwestern forest ecosystem.

Kimberly Campos, Graduate Student

Identifying Disparities in Air Pollution Exposure and Transit Access in the South Los Angeles Region

Faculty Mentor: Tianjun Lu, Earth Science

While transportation system is a crucial component in urban environments, traffic-related air pollution (TRAP) poses greater threats to historically marginalized communities (e.g., people of color, persons living in poverty) where community residents experience this environmental harm at disproportionate rates to their privileged counterparts. The South Los Angeles region of California receives more attention to TRAP studies due to the diversity of the population and transportation infrastructure throughout the region. This study examines the air pollution distribution, transportation access, and population demographics. Notably, this study conducts a spatial analysis on traffic-related air pollution exposure and infrastructure qualities (e.g., road densities, transit access, and walkability) alongside population demographics. Statistical tests determine the significance of disparities between air pollution exposure and transit access based on demographic factors. This study finds that there are significantly higher rates of air pollution exposure closest to major freeways, which coincidentally has high road density and higher population of historically marginalized groups. Additionally, distance to the nearest transit stops decreases towards the inner Los Angeles region, suggesting the public transit is more accessible within the more populated areas of the county. The study results will be helpful to identify areas deserving of directed mitigation efforts for improved air quality and access to equitable transportation options.

Angelo De Guzman, Graduate Student

Wildland-Urban Interface Controls Vegetation Recovery after Fire – A Case Study from the Station Fire

Faculty Mentor: Parveen Chhetri, Earth Science

Although wildfires play an integral role in ecological functioning and biodiversity, recent studies pose wildfires as a threat to vegetation structure, composition, and recovery. Elevation, soil erosion, fire intensity, and hydrology are major complex factors that affect vegetation structure loss. However, other factors such as the wildland-urban interface (WUI) and anthropogenic factors in conjunction may destroy forest vegetation further. WUI is the transition between unoccupied land and human development. Urbanization tied with the WUI has disrupted the soil profile and has a huge impact on vegetation recovery. The present study utilizes spectral indices and active remote sensing to assess whether WUI and non-WUI areas control vegetative recovery post-wildfire. Normalized Difference Vegetation Index (NDVI) uses electromagnetic wavelengths to highlight vegetation health and greenness as a proxy of vegetation abundance. Similarly, Normalized Difference Burn Ratio (nDBR) exhibits burn severity and highlights potential post-wildfire vegetation regrowth. Light detection and ranging (LiDAR) use pulsed light to measure vegetation biomass, carbon sequestration, tree canopy cover, and height. The first objective of this study was to assess spatial differences in healthy vegetation pre-wildfire and post-wildfire vegetation using NDVI indices. The second aim was to assess potential differences in post-wildfire vegetation recovery using nDBR indices. The third objective of this study was to highlight the significant differences in carbon sequestration and biomass coverage of WUI and non-WUI areas. A statistical analysis was conducted to determine the correlation between carbon sequestration and biomass coverage of WUI and non-WUI areas. Another statistical analysis was performed to differentiate the means of carbon sequestration and biomass coverage of WUI and non-WUI areas. Results indicate that WUI areas exhibit slower vegetation recovery rates than non-WUI areas.

Richard Quiloan, Graduate Student

Using Generative Machine Learning Models to Protect Patient Privacy

Faculty Mentor: Sanaz Rahimi Moosavi, Computer Science

Machine learning is transforming the world industry by industry. Over time and with more data, machine learning models progress to support humans in making more efficient and more strategic decisions. Machine learning generates a plethora of incredible opportunities, but it comes with an inherent and serious weakness in privacy protection. More specifically, the data of individuals that is used to feed machine learning models can be exploited by adversaries to remove privacy safeguards and access sensitive user information. In regard to machine learning, protecting data privacy is unique from traditional data privacy protection in that machine learning can be used to both preserve privacy and infiltrate privacy protections.

Machine learning is beginning to have a major impact in healthcare, a slow-to-evolve industry. Combined with the advancing progress in cloud/edge computing, mobile communication, and big data technology, machine learning has the potential to highly accurately predict outcomes and promote smart healthcare that can focus more on what is most important - quality care for patients.

The main goal of this project is to review and critically analyze all the generative machine learning models that can be used to preserve patient privacy in healthcare systems. We investigate existing approaches for generative machine learning models to gain a comprehensive understanding of the current state of research in such systems. We then employ a proof-of-concept generative machine learning algorithm to generate synthetic health data. This approach protects patient privacy by essentially removing the opportunity for adversaries to re-identify an individual patient through his or her data.

Result: After applying the 2G8 antibody on the Detoxi-Gel an ~ 43% or 0.3405 mg was recovered from the sample from 0.8 mg. The Endotoxin Units per milliliter (EU/ml) was 12,665 before cleaning and 0.15 EU/ml after.

Conclusion/summary: The FDA regulates the acceptable level of endotoxin contamination to be 0.5 endotoxin EU/ml. Thus, our purification method was successful in producing an acceptable levels of endotoxin in the 2G8 antibody. The purified antibody will be tested for its efficacy in protecting against fungal infections in mice.

Health, Nutrition, Clinical Sciences

Danielle Clay, Graduate Student

Non-Pharmacologic Interventions to Prevent or Reduce the Incidence of Chemotherapy-Induced Peripheral Neuropathy: An Integrative Review

Faculty Mentor: Samira Moghrabi, Nursing

Chemotherapy-induced peripheral neuropathy (CIPN) is a complication that affects 68% of cancer patients receiving neurotoxic chemotherapy. Despite its long-lasting adverse impact on the patient's physical and psychological wellbeing, no medication has yet been identified to prevent CIPN. Consequently, nonpharmacologic interventions have been explored to identify alternative treatments to this devastating complication. Purpose: This integrative review was conducted to examine the existing literature relative to the most effective non-pharmacologic intervention in preventing CIPN in chemotherapy naïve cancer patients. Methods: CINAHL, PubMed, and Medline databases were used to identify relevant literature using the Boolean phrases "chemotherapy induced peripheral neuropathy" AND "prevention". Primary English articles investigating non-pharmacologic interventions to prevent CIPN in neurotoxic chemotherapy naïve adult oncology patients were included. The quality and level of evidence of each included article were assessed using the Melnyk and Fineout-Overholt's Hierarchy of Evidence for Intervention Studies. Results: Eight randomized control trials, two quasi-experimental self-control studies, one retrospective study, and one prospective single arm study were included in this review. Across these 12 articles, 6 interventions were investigated: (1) cryotherapy (2) hand compression (3) acupuncture, (4) exercise, (5) hands and feet massage, and (6) vitamin B complex supplements. Conclusion: The quality of the studies included in this review were limited by the study design, small sample size, and lack of post-intervention follow-up. Despite these limitations, exercise, acupuncture, and massage were the only interventions that have shown some promising effects. Vitamin B did not show significant impact on CIPN. Further studies on the safety and efficacy of cryotherapy and compression are needed. This review revealed a need for high quality, longitudinal large scale RCTs to better understand the benefit of these nonpharmacologic interventions in CIPN.

Noelle Wada, Salma Sudarmadji , Mayán Rodriguez , Graduate Student

The Lived Experiences of Internationally Adopted Children

Faculty Mentor: Sheryl Ryan, Occupational Therapy

An internationally adopted child living in a cross cultural and/or transracial family might struggle with forming their identity (Reynolds et al., 2016). Various factors, such as whether the family actively helps the adoptee connect with their ethnicity, contributes to establishing identity (Baden et al., 2012). There is little research regarding how the culture of the adoptee's birth country, along with the culture of the adoptee's family influences identity. Little is known regarding how cultural occupations, such traditions, might influence an adoptee's identity as well. Therefore, the purpose of this phenomenological study was to examine how culture and occupations contribute to the identity making of the adoptee. By using semi-structured interviews with adults of various ethnicities who have been adopted internationally, it was possible to get a glimpse as to how their culture and occupations were part of the identity forming process. Cultural occupations affect one's day to day life, helps cultivate pride, are affected by stereotypes, and helps connect families; all of which contribute to one's identity. With this information, parents and occupational therapists may be better equipped to support an adoptee navigating the path towards identity development. Keywords: international adoption, culture, occupations, identity, family.

Mina Kim, Roy Jeon, Lydia Lee, Mohammad Maabreh, Graduate Student

Perceptions of Male Occupational Therapists on Delivering Hands-on Care to Pediatric Female Clients

Faculty Mentor: Sheryl Ryan, Occupational Therapy

Male occupational therapists (OT) generally enjoy working in a female-dominated profession. Male OTs, like male nurses, may experience gendered care delivery and gender stereotyping. We examined an underexplored topic of male OTs' perceptions on delivering hands-on care to pediatric female clients. Methods: The phenomenological study conducted semi-structured interviews with four registered male OTs with at least one year of experience with the pediatric population. Results: Three themes emerged: relevance of the therapist's and client's gender, setting, and rapport. Male OTs consider their gender advantageous when working with the pediatric population. Conclusion: Within the larger conversation about male healthcare practitioners, the findings suggest that male OTs do not experience the same discomfort levels, liability concerns, and gendering as male nurses. The study helps reassure present and future OT practitioners who may be nervous about working with the pediatric population.

Ria Glassman, Nina Hoang, Kristina Ballard, Caitlin Terry, Graduate Student

My Therapist Is the Trees'': A Phenomenological Study of Experiences of Spirituality in Nature

Faculty Mentor: Sheryl Ryan, Occupational Therapy

The increasing number of adults suffering from symptoms of depression and anxiety is a call for occupational therapy interventions that address these symptoms in order to promote occupational balance. Nature-based interventions are an avenue for occupational therapists to support clients with exploring the domain of spirituality and improving mental health outcomes. The purpose of this study was to understand the role nature plays in spirituality for adults experiencing symptoms of anxiety and depression.

Method: A qualitative, phenomenological methodology was selected to assess participant's experience of spirituality through engagement in nature for eight adults. Horizontalization was used in the reduction process of the data analysis which assigned equal value to each participant's statements. Transcripts were coded by researchers individually and as a group to compare codes and find common themes.

Results: Data analysis revealed four main themes: (a) nature is healing, (b) nature provides connection (with the earth, others, themselves, and their spirituality), (c) spirituality is ineffable, and (d) spirituality is a practice.

Conclusion: The results from this study emphasize the interconnectedness of meaning-making, activities in nature, spiritual practice, and positive mental health outcomes. All participants expressed that their spiritual practice was integral to positive mental health outcomes. Therefore, the domain of spirituality needs to be emphasized during initial conversations and in subsequent interventions with the client. Nature can be used as a conduit through which OTs can effectively explore client spirituality.

Lisette Martine-Torres, Jenna Meyers, Sarah Milbrodt, Serena Ortiz, Graduate Student

The Influence of Traumatic Brain Injury on the Friendship Roles of Survivors

Faculty Mentor: Sheryl Ryan, Occupational Therapy

Traumatic brain injuries (TBI) are a leading cause of long-term disability that create disruptions in the lives of survivors. Research has demonstrated that social networks can buffer some of the negative effects of TBI. This study aimed to investigate how a TBI influences the friendship roles of survivors.

Methods: This study was designed as a qualitative, phenomenological study in which three individuals with TBI participated in a semi-structured interview.

Results: Data analysis generated 4 themes: (a) personality and cognitive changes impact friendships, (b) learning compensatory friendship strategies, (c) changes in abilities and tolerance for activities limit social interactions, and (d) changes in perspectives on friendship.

Implications: The results support occupational therapy interventions that promote the social engagement of survivors. Specifically, providing strategies for emotion regulation and communication and suggesting suitable activities and resources for survivors.

Claire Stacy, Lauren V. Sabihon, Cassandra R. Sigua, Araceli Villarreal, Graduate Student

The Career Development Process of Occupational Therapy Practitioners Utilizing Animal Assisted Therapy

Faculty Mentor: Sheryl Ryan, Occupational Therapy

Although there is ample evidence to support the psychological benefits of animal assisted therapy (AAT) with different populations and settings, there are few to no relevant studies that address the career development process of occupational therapy practitioners (OTPs) utilizing AAT. This study employed a qualitative narrative design through interviews with four OTPs who have utilized AAT with dogs, which allowed the researchers to explore the participants' career development process. Researchers found that each participant used unique avenues of learning about and eventually utilizing AAT. One recommendation discussed introducing AAT within coursework more frequently and in depth. Another recommendation included having more AAT specific research in occupational therapy and continuing education courses that review interventions available to OTPs interested in AAT. Participants expressed it would be extremely beneficial to have official certifications for both the dog and OTP.

Emily Acker, Hannah Chang, Annabelle Clegg, Megan Gibson, Graduate Student

Exploring the Mothering Occupations of Women with Physical Disabilities

Faculty Mentor: Sheryl Ryan, Occupational Therapy

Despite the growing number of women with physical disabilities having children, little research has been conducted to understand their mothering occupations. Literature does show mothers had variable experiences with occupational therapists (OTs) (Wint et al., 2016; Powell et al., 2019). The purpose of this study was to explore the mothering occupations of women with physical disabilities to inform OTs on how to support this population. This study utilized a qualitative narrative method and photo elicitation. A total of six women participated. Interviews were transcribed and coded based on prominent features, then grouped into six themes: stigma, parenting strategies, adaptive equipment, social support, condition-related challenges, and interactions with OT. This study suggests OTs should educate themselves about the experiences of parenting with a physical disability. Effective interventions can include adaptive equipment, energy conservation, environmental modification, and advocacy.

Suzette Chavez, Hannah Mi Chang, Jessica German, Graduate Student

Community-based practice for underserved stroke survivors: A case study

Faculty Mentor: Sheryl Ryan, Occupational Therapy

Occupational therapists are critical in improving the function and enabling performance of adult's post-stroke. Nevertheless, many stroke survivors are challenged with receiving essential rehabilitation services after inpatient discharge. The study's focus is to gain insight on the influence a community-based program has on post-stroke care and on the process involved in community-based program implementation.

Methods: A qualitative case study of a community-based stroke center was utilized. Semi-structured interviews of 9 participants, consisting of 7 underserved stroke survivors and 2 staff members, were conducted and transcribed. Thematic analysis was utilized to identify common themes that arose from transcriptions for data analysis and interpretation.

Results: Five themes were generated: 1) peer, staff, and family social support 2) improved physical outcomes 3) improved mental health and well-being 4) need for advocacy, and 5) need for resources and inclusion.

Conclusion: The study highlighted how the community-based stroke center provides stroke survivors with chronic rehabilitative care that is difficult to attain elsewhere. The stroke center allowed members to engage in meaningful activities and reintegrate into the community. In addition, the value of the center was recognized as a model that can be used in other cities.

Morgan Kumlin, Shekinah Laylo, Minji Kim Graduate Student

The Lived Experiences of First-Generation Immigrants in Los Angeles Navigating the Healthcare System

Faculty Mentor: Sheryl Ryan, Occupational Therapy

In 2018, immigrants represented 13.7% of the population of the United States, and despite their continuous growth in numbers, immigrants disproportionately represent the uninsured in the nation (Budiman, 2020; Vargas Bustamante et al., 2012). They are twice as likely to lack health insurance compared to native born Americans and are also more likely to spend more on treatment for mental illnesses that could have been prevented with access to insurance (Amuedo-Dorantes & Zhan, 202; Huntress & Kenney, 2014; Vargas Bustamante, 2012). In order to protect and promote the public health of the United States it is important to address the health of all residents. The objective of this study was to gain insight into the perceptions and values of English-speaking first-generation immigrants in Los Angeles County in respect to accessing healthcare, and how occupational therapists can bridge potential gaps in accessibility as cultural navigators. A qualitative phenomenological design was used to collect data through semi-structured interviews with six English-speaking participants and analyzed using coding and thematic analysis. Results revealed the importance of government funded programs to increase accessibility, utilization of services as mostly reactive instead of preventative, and the importance of a positive patient provider relationship. These findings indicate that occupational therapists can serve as cultural navigators by advocating for government-funded programs, health promotion and prevention, and by improving patient-provider relationships through therapeutic use of self which is a technique geared towards providing client-centered care and relationship-building.

Adriana Del Barco, Postback credential/certificate

Cervical cancer screening in patients on the Female to Male Transgender Spectrum

Faculty Mentor: Payman Nasr, Clinical Science

(ASC-H), and 1/82 (0.01%) low grade intraepithelial lesion (LSIL). Human papillomavirus (HPV) results were available for 40 patients; 10 were positive for high-risk HPV. Among the cases with atrophy, 2 had a prior Pap diagnosis of ASC-H, one LSIL with negative HPV test, one ASCUS with HPV positive. The remaining 14 atrophic cases were interpreted as negative, with 5 of them having HPV positive result.

Conclusion:

In conclusion, the most common FTM transgender male cervical pap smear was NILM with atrophy followed by unsatisfactory. 2/82 of cases were interpreted as ASC-H cytologically, and subsequently diagnosed as atrophic in follow up. Pelvic exams to obtain pap smears may be challenging for transgender patients; therefore, in order to avoid unnecessary invasive procedures, appropriate history should be provided by the clinicians to assist the cytotechnologist who is screening FTM transgender male cervical pap smears.



Student Research Conference

Posters Abstracts

Wednesday February 16, 2022

- Behavioral and Social Sciences
- Natural Sciences

Behavioral and Social Sciences

Denise Aguiluz, Antonio Romero, Taylor Duffy, Daniel Correa, Graduate Student

Type 2 Diabetes Threat Appraisal & Exercise-Self-efficacy as Predictors of Vigorous Exercise among at-risk Latinx Students.

Faculty Mentor: Silvia Santos, Psychology

This study examines type 2 diabetes threat appraisal, gender, and exercise self-efficacy to distinguish between at-risk Latinx college students who engage in vigorous exercise or not. The sample included 156 Latino/as college students at risk for type 2 diabetes due to familial history. Participants were predominantly female (66%). The total sample was considered overweight based on BMI. A multiple regression was run to predict vigorous exercise from three threat appraisal variables: perceived diabetes risk, perceived threat, and genetic risk. Gender and exercise self-efficacy were also expected to predict vigorous activity in the analysis. The overall model was significant [$F(5, 146) = 10.80, p < .001$], and the predictors accounted for 27% of the variance of vigorous exercise. Gender and exercise self-efficacy were significant predictors of vigorous exercise. Men engaged more in vigorous exercise compared to females. Participants with higher levels of self-efficacy engaged more in vigorous exercise. Threat appraisal variables were not significant in the model. Then, a binary logistic regression was performed to identify if gender and exercise self-efficacy predicted who met federal guidelines for vigorous exercise of a minimum of 60 minutes per week versus who did not. The overall regression equation was significant and provided a good fit for the model, $\chi^2(2) = 31.89, p < .001$, Nagelkerke $R^2 = .247$. Exercise self-efficacy was found to be a significant predictor of vigorous exercise. With everyone unit increase in exercise self-efficacy, the odds of being classified as “meeting federal guidelines of vigorous exercise” was 2.92 times greater than the odds of being classified as “not meeting federal guidelines of vigorous exercise.” Gender was not found to be significant in this model. Future college interventions should focus on promoting exercise self-efficacy to lower the onset of type 2 diabetes among at-risk Latinx college students.

Madison Reyna, Graduate Student

Retrospective Self-Reports of Parental Monitoring

Faculty Mentor: Carl Sneed, Psychology

With the increased accessibility of technology, parents have had to modify their ways of monitoring to adapt to the widespread use of technology among their children. However, very little research has been conducted on parental use of technology for monitoring the behavior and location of their children. Therefore, the purpose of the current study is to examine attitudes toward the use of technology for parental monitoring and gather information from retrospective self-reports of parental monitoring. This study contains an exploratory analysis as no assumptions were made about students' past behaviors. A sample of 114 CSUDH students completed an online survey that contained questions relating to their adolescent experiences. Specifically, questions regarding opinions on parental behaviors, perceived parental self-efficacy, parental psychological control, resilience, and demographic questions relating to their personal background and home life. Most participants were female, first-year students between the ages of 18-19 years old and of Hispanic/Latinx ethnic background. The current study found that on average, participants did not agree with parents using technology to monitor their children. Additionally, most participants reported their parents did not track their location while they were adolescents. Furthermore, there was a positive correlation between parental monitoring and parental monitoring with technology ($r = .22, p = .02$) indicating that participants who reported more parental monitoring were also likely to report more parental monitoring with technology. These findings suggest that although parents have access to technological means to monitor their children, most parents are not utilizing them.

Belen Guillen, Tristan Ayoubi, Dominique Hall, Antoya Graham Graduate Student

The Trajectory of Research of COVID-19's Effect on Working Populations

Faculty Mentor: Ashley Membere, Psychology

The aftermath of the COVID-19 pandemic and subsequent shut down left damaging impacts on the workforce that has been researched extensively. However, there has been previous criticism of the lack of representation in work and management research samples (Bergman & Jean, 2016) that led us to question what populations are being represented in these studies. Many historically underrepresented populations were impacted during the COVID-19 pandemic, including people of color and the working class. To locate studies, student researchers used a 'covid-19 or coronavirus or 2019-ncov or sars-cov-2 or cov-19' search string along with journal names in PsycInfo, Business Source Premier, and Academic Search Premier. Searches were also performed directly on journal websites for articles published up to October 2021. We then saved results in Zotero, for later pruning. 741 articles across 50 journals in industrial/organizational psychology and management were narrowed down to 388 articles using Nvivo to only include articles that mentioned COVID-19 in the abstract and/or keywords. We have 125 articles categorized as research about the impact of COVID-19 on the workplace that will be analyzed further. 77 articles collected data and 48 are review/commentary articles. For future analysis, the research team will read the full text of the 125 articles and categorize them based on a number of characteristics: type of sample (e.g., retail workers, healthcare, management), country of data collection, demographics of sample (e.g., gender, racial composition), and outcomes measured (e.g., physical, psychological, social, family). These categorizations will allow us to assess if COVID-19 research within I/O psychology and management fails to focus on the effects of the pandemic on those who are most impacted. Following this, we can create a series of recommendations to researchers on how to address our gaps of knowledge about the effects of COVID-19 for understudied samples.

Miguel Palacios, Graduate Student

Differences in Social Support and Mental Health Among Urban College Students

Faculty Mentor: Giacomo Bono, Psychology

Urban universities have been essential to helping young adults achieve life goals and increasing the social mobility of the students and the communities they serve. Unfortunately, due to the COVID-19 pandemic, the students and communities these urban universities serve now need to contend with new challenges that compounded the stress of many students, especially underrepresented minorities who were disproportionately harmed by the pandemic. The purpose of this study was to look at the resilience and mental health (levels of anxiety, stress, and depression) of college students at California State University, Dominguez Hills (CSUDH) during the pandemic. We were specifically interested in looking at social support as a predictor for resilience, stress, anxiety, and depression symptoms. This study was a longitudinal study that took place at CSUDH. It started during the 2020 fall semester and went through the 2021 spring semester. There were four-time points: the start of the 2020 fall semester, the end of the 2020 fall semester, the beginning of the 2021 spring semester, and the end of the 2021 spring semester. There were (n = 341) participants taken from psychology and business courses from CSUDH. Data was collected from Alchemer and once the participants finished, they were awarded credit for their course. We predict that individuals with high social support will exhibit higher levels of resilience compared to individuals with little to no social support (PeConga et al., 2020). We also predict that individuals with low levels of social support will experience higher levels of stress, anxiety, and depression compared to individuals with high levels of social support (Wasserman et al., 2021). We plan to run ANOVA's to examine the differences between individuals with high social support and individuals with low social support.

Marissa Wenzell, Graduate Student

Grit, Academic Function, Academic Harm, Resilience, and SES During the COVID-19 Pandemic

Faculty Mentor: Giacomo Bono, Psychology

During the COVID-19 pandemic, the academic function of college students has been harmed due to various global and personal circumstances. The definition of grit has existed for over a decade, but recent research suggests that in addition to consistency and perseverance with respect to goals, grit also includes adaptiveness with goals (Datu et al., 2017). Further, these researchers found that adaptability function of grit predicted academic and career development self-efficacy among college students. Bono et al. (2020) found that academic harm from the pandemic was higher for lower SES students than moderate SES college students, but grit was related to more resilience and well-being and marginally less academic harm from the pandemic. The current study builds on this by examining if grit is protective of academic functioning by contributing to more resilient responding to the pandemic. An online survey including questions pertaining to grit, academic functioning, resilience, and SES was sent to college students at the beginning of the Fall 2020 semester and the end of the Spring 2021 semester. A sample of 85 students was obtained. It consisted of 23 (27.1%) men and 62 women (72.9%) ranging in age from 18-55 years ($M = 20.67$, $SD = 5.27$). Bivariate correlations were used to gather preliminary results. Academic harm from the pandemic was negatively correlated with grit and with resilient responding to the pandemic at both Time 1 and Time 2. For the current study, multiple linear regression analyses will be used to better explore the relationship between academic function and grit. Specifically, mediation will be used to see if resilience mediates the relationship between academic harm and grit, and moderation will be used to see if SES moderates the relationship between academic function and grit. Implications for supporting college students in the aftermath of the pandemic will be discussed.

Jennifer Marie Correa, Nasim Karimi, Christian Riley, Julissa Magana, Graduate Student

The Impact of COVID-19 On CSUDH Students

Faculty Mentor: Steven Freeze, Psychology

The COVID-19 pandemic rapidly spread around the world, causing massive disruptions to everyday life and in some cases resulting in irreparable harm. The Center for Disease Control and Prevention (CDC) has declared a grand total of over 51 million COVID-19 cases and an ongoing death count of over 800,000 people in the United States. College students are one of the hardest hit populations who struggle to maintain their previous level of functioning achieved prior to the pandemic. Routine activities for students such as attending class became difficult, sometimes overwhelming, during the remote learning environment. Coursework, which must be achieved, has become increasingly complicated as students cope with isolation, address stress and attempt to stay focused on their personal and professional objectives. This study will examine how COVID-19 has impacted student issues ranging from the academic environment (including student perceptions of campus resources), the management of stress, social networking, adjustments to value systems, and hopefulness and resilience. The survey questionnaire will obtain information on a variety of everyday measures including the emotions experienced by students during this period (the PANAS-X scale will be employed). One of the primary objectives of this research is to illuminate students' experiences during the period of time when classes were operated primarily through remote instruction. This study will also consider which campus resources were perceived as available and helpful to students. It is hoped that the findings from this study will enable all constituents in the university community to better prepare for and improve their ability to respond to future crises. The project is in the final stages of development and will be submitted to IRB in the early Spring.

Lindsey Washington, Graduate Student

Educator Burnout in Underserved Communities: Examination of Family and Workplace Social Support

Faculty Mentor: Monique Willis, Marital and Family Therapy

Educator burnout is prevalent with harmful effects on teachers and educational systems across the United States. Teachers who experience “burnout” may encounter a range of negative symptoms, including feelings of energy depletion and exhaustion, mental distance from their professional role, and ineffectiveness and lack of accomplishment. For example, according to a 2021 State of the U.S. Teacher Survey, 75 percent of teachers reported frequent job-related stress compared to 40 percent of other working adults. In addition, of those surveyed, 27 percent of teachers reported symptoms of depression, and 25 percent of teachers shared they were likely to leave their jobs by the end of the 2020-2021 school year, post-COVID-19 (Steiner & Woo, 2021). Furthermore, inner-city teachers experience high levels of burnout due to unique factors evident in underserved communities. In these instances, educators in these communities bear the weight of achievement gaps between students of color and their White counterparts, challenges of community adversity, systemic oppression, and a lack of adequate resources (Farber, 1998). Currently, there is a lack of research concerning how inner-city teachers can remedy their burnout levels amid these additional factors. Studies on social support suggest the importance of teachers’ interpersonal relationships and social support from their family system. More importantly, school leaders can aid in lessening the effects of burnout even among inner-city educators. Specifically, McCormick (2019) suggests that money allotted to mental health services for educators in an underserved community can decrease teacher turnover rates and increase teachers’ patience, which positively impacts students’ mental and emotional well-being and academic performance. This study continues to add to the body of literature on inner-city teachers. It will further explore teachers’ experiences in a city in Los Angeles County social support (both familial and school staff support). Additionally, the research will look at the implications that having social support might have on these teachers’ burnout rates and levels of stress.

Natural Sciences

Kevin Quezada Alvarez, Undergraduate Student

Analysis of the Importance of ycfM, hofM, and iraD for Escherichia coli’s Survival in Long Term Stationary Phase

Faculty Mentor: Karin E. Kram, Biology

The bacterium *Escherichia coli* can survive for long periods without additional nutrients in a growth phase called Long Term Stationary Phase (LTSP). LTSP allows us to use the laboratory to imitate *E. coli*’s natural environmental conditions more closely. During this phase, the bacteria adapt to multiple growth and death cycles, along with changes in nutrient levels and composition accompanied by other stressors. This phase has only recently been examined, which means the genes responsible for the ability to survive in these conditions are not completely known. To understand which genes are needed for the cells to adapt and survive, competitions between wild-type (WT) & mutant (Δ hofM, Δ ycfM, Δ iraD) strains were performed. hofM is responsible for the utilization of DNA as the only source for carbon and energy and iraD helps to regulate the transition from log phase to stationary phase. Through competitions, we have shown that these genes do not have any effect during LTSP when deleted from the *E. coli* genome, even though they were previously identified as possible targets. However, the strain missing the gene ycfM, which helps to generate peptidoglycan in the cell wall of the bacterium, was outcompeted by WT during competition. This means that the ycfM gene is important for survival in LTSP when competing against the WT strain. Further research will determine why ycfM has this effect and will also help identify other genes that are important in LTSP.

Kevin Mosqueda, Kelsie Kaufman, Raven Nolasco, Undergraduate Student

Pervasiveness of Microplastics in the Southern California Bight

Faculty Mentor: Samantha Leigh, Biology

Microplastics (MPs) are a growing issue that needs to be addressed in the same respect as macroplastics as they pose dangers to marine life. Given they are still largely understudied, this research aims to study the number and types of MPs in water and zooplankton (a primary food source for many marine organisms) samples in the Southern California Bight. From the data analysis (using averages, ANOVAs, and standard deviation), it was found that fibers were more abundant than particles in all samples and water samples had more MPs in general. For instance, Palos Verdes had the greatest amount of MPs present in plankton samples, yet the least in water samples. Additionally, two types of fish, the Northern Anchovy and California Halibut are currently being dissected to take a look at selective tissues. In the future, these tissues will undergo MP extraction to analyze the quantity of MPs present and to discover how many MPs are being transferred from zooplankton to the fish that eat them.

Jocelynn Mena, Undergraduate Student

Identifying if ycfJ, yqgB, malZ and tfaS Play A Role in Long-Term Stationary Phase in Escherichia coli

Faculty Mentor: Karin Kram, Biology

Escherichia coli can survive long periods of time by adapting to live in stressful environments. *E. coli* enters a long-term stationary phase (LTSP) when it grows in an environment where nutrients are scarce; this is one of the five phases in bacteria's life cycle. After "stationary phase", over 99% of the cells die. The remaining cells survive into LTSP, which can be used as a proxy for a more natural environment in the lab to observe how cells adapt to these conditions. The genes which may be important to survival or adaptation in this phase are mostly unknown. Previous work in the Kram Lab screened through a collection of *E. coli* strains missing one gene each and identified a total of 101 gene deletions that affected the cell's ability to survive in long-term cultures when competing with wild-type strains (those that have the gene). To confirm that these genes actually play a role in survival, I compared the effect of the genes ycfJ, yqgB, malZ and tfaS in competition with wild-type *E. coli*. We found that the deletion of yqgB had no effect on growth of *E. coli* while competing with wild type. The strain missing ycfJ was outcompeted by the wild type. ycfJ is activated upon biofilm formation and is involved in flagellar synthesis, swarming, and cell elongation. The strain missing malZ is greatly outcompeted by the wild type as well. malZ is involved in maltose metabolism. The strain missing tfaS, is greatly outcompeted by the wild-type strain. These data confirm at least three genes from the initial screen are important for survival in LTSP when competed with wild-type strains... Our continued research will help to determine why these are essential for survival into LTSP by determining their function in long-term cultures.

Marialuisa Flores-Jacobo, Undergraduate Student

Invasive Plant Species Exhibit Population-level Differences in Phenotypic Plasticity in Response to Nitrogen Availability

Faculty Mentor: Justin Valliere, Biology

The invasion of non-native plants is a leading cause of habitat loss and a major threat to our economic and environmental sustainability. The constant input of nitrogen pollution into our environment and climate change also play a key role in the degradation of native plant communities. Our project aimed to explore and understand the impact nitrogen deposition (due to air pollution) and climate have on two widespread invasive plant species of Southern California. In a common garden pot experiment, we compared the growth and functional traits of multiple populations of these species using plants grown from seed collected from 12 field sites that experience different levels of nitrogen deposition and aridity. For the experiment, half of the plants received added nitrogen and the other half did not. Using data from this plant growth study, we evaluated the influence of nitrogen and climate on invasive plant traits and their phenotypic plasticity, including for phenology, growth, and reproduction. Our overall research goal was to understand if site-level variables (climate and nitrogen deposition) play any major role in driving plant invasiveness, independently or in conjunction with one another.

Preliminary results strongly suggest that both species evaluated exhibit population-level differences in phenotypic plasticity in response to nitrogen availability. These responses may be driven by local adaptation in these populations to nitrogen deposition and climate. This work highlights how problematic plant invasives may respond to evolutionarily to environmental conditions, which could contribute to their invasiveness.

Mayra Hernandez, Undergraduate Student

Exploring the Impacts of Multiple Anthropogenic Stressors on California's Coastal Sage Scrub

Faculty Mentor: Justin Valliere, Biology

Dramatic changes in climate, soil nitrogen (N), and wildfire regimes in southern California are shifting the abundance and composition of vegetation – increasing invasive species and reducing native biodiversity. N deposition, the input of N from the atmosphere to ecosystems, is increasing due to air pollution. Although N is necessary for vegetation, it can be detrimental to ecosystems when extreme levels are present. Likewise, plant communities native to southern California's Mediterranean-type climate have evolved to thrive under historical wildfire conditions. However, increasing occurrences of fire can shift the plant composition, to the point of converting to invasive-dominated grasslands. Global change-type droughts have also altered the conditions under which vegetation survive and extreme drought may exacerbate the impacts of other stressors. To identify and quantify the effects of these potential anthropogenic stressors on southern California's coastal sage scrub species, we conducted a field N addition experiment at Deer Creek Canyon Park within the Santa Monica Mountains, a site which naturally experiences low levels of N deposition. To explore potential impacts caused by N deposition, a gradient of soil N availability was created by adding N at two levels corresponding to levels of N deposition under moderate and high levels of air pollution. Control plots received no N addition. Vegetation was monitored from 2012 to 2017 during which the site experienced an intense drought and the 2013 Springs Fire, allowing for observations on the effects of N addition on post-fire recovery. Data on community composition, shrub cover and resprouts, and soil N was statistically analyzed through R. Preliminary results of this long-term field study suggest N addition may alter community responses to drought and fire. Information on potential interactions between multiple anthropogenic stressors may provide applied ecologists with a better understanding of future vegetation patterns in southern California shrublands under continued environmental change.

Ruben Lopez, Undergraduate Student

*The Importance of the Genes *bdm*, *phoP*, and *sdhE* in Long-Term Stationary Phase in *Escherichia coli**

Faculty Mentor: Karin Kram, Biology

Escherichia coli goes through five phases in its life cycle: lag, log, stationary, death, and long-term stationary phase (LTSP). In the laboratory, we use LTSP to mirror a more natural environment where the bacteria must adapt in order to survive. Through previous work, the lab has identified a number of genes that may be important to the LTSP. The goal of this project is to determine the importance of each identified gene and deepen our understanding of LTSP. To achieve this, a knockout mutant strain of *E. coli* missing one of the previously identified genes was made and competed against the wild-type strain of *E. coli* in LB media. Over the course of ten days, the culture was closely monitored by determining cell counts of each strain (the mutant and wild type), to obtain a growth curve. We have observed that the strain missing *sdhE* or *phoP* underperforms in LTSP compared to wild-type strains. The strain missing *bdm*, on the other hand, outcompeted the wild-type strain in our experiment. The gene *sdhE* helps the cell to use succinate as a carbon and an energy source. *phoP* is a dual transcriptional regulator that activates multiple genes involved in behaviors like: Mg^{2+} homeostasis, resistance to antimicrobial peptides, acid resistance, and LPS modification. *bdm* stands for biofilm dependent modulation and is involved in regulating flagellar biosynthesis. The data indicates that all three genes affect LTSP; *sdhE* and *phoP* are essential for survival (without them, cells die in LTSP when competed with wild-type strains) and the loss of the *bdm* gene actually gives the mutant strain an advantage in LTSP, indicating its presence may hinder survival. Further work will help to understand the complexities of LTSP, and the role of these genes in adaptation to this environment.

Susana Lopez-Ignacio, Undergraduate Student

*Rare Species in *Encelia**

Faculty Mentor: Sonal Singhai, Biology

My research focuses on two rare species in the desert plants *Encelia*, *Encelia ravenii* and *Encelia densifolia*. The rare species of *Encelia* are primarily found in certain spots of Baja California. We define “rare” on how limited its geological range is and the low population density the plant has. The desert flora has a very small population and at specific locations one can count each individual rare *Encelia* by hand. *Encelia*, as well as many other desert plants, go through a process called “seed-banking”, which is when seeds are present in the soil and they will remain there until germinated. This and other factors, ecological or genetic, could be the reason why *Encelia* is slowly diminishing. There are 15 species of *Encelia*, and we are analyzing genetic data from 10 species. We are determining if there is a difference in genetic variation and diversity between the rare and non-rare species. We hope to understand if rarity reduces genetic diversity in these plants, thus putting them at increased risk for extinction.

Joie Luna, Undergraduate Student

Urban Coyote Project at CSUDH: Using Urban Ecological Research to Guide Wildlife Management

Faculty Mentor: Justin Valliere, Biology

Coyotes' populations have been increasing in highly urbanized areas, including in the greater Los Angeles area. In 2020 the CSUDH campus community noticed a high amount of coyote activity and brought it to the attention of the Office of Risk Management. Coyotes have been known to inhabit the campus and surrounding area but due to Covid-19 their presence was more noticeable with less staff and students on campus. As part of Professor Valliere's spring 2021 Ecology course, we aimed to determine when and where coyotes were active on campus and what food sources coyotes were utilizing. In order to evaluate coyote activity and abundance, we installed a network of nine camera traps in different locations across campus and analyzed the captured images for wildlife activity. We identified all species observed and recorded the location, data, and time into a spreadsheet. The most frequent species observed was the desert cottontail rabbit, coyotes, and rats. Across all locations we recorded about 400 individual sightings of coyotes. The coyotes were active all day, but activity peaked in the late afternoons, evenings, and early mornings. To analyze coyote diets, we collected scat samples from Heritage Creek and dissected and weighed the samples to determine the food sources coyotes were eating. We separated samples into different food sources including, plant seeds, insects, mollusks, bones, fur, and anthropogenic food sources (e.g., trash). We determined that the coyotes on campus mainly ate small mammals, since fur and bones were the largest proportion of mass and the most frequently present food sources in samples. We continue to recommend further monitoring, proper signage, education about the coyotes, and proper landscaping in order to manage campus coyotes. With education and proper landscaping, humans and coyotes may be able to safely coexist on campus.

Mikaela Gil, Undergraduate Student

Playing with Fire: Potential Benefits and Risks of Prescribed Burning for Grassland Management in California

Faculty Mentor: Justin Valliere, Biology

Prescribed burning is a tool that can be used by land managers to promote and enhance growth of native vegetation, control invasive species, and reduce fuel loads that contribute to wildfires. This management strategy has been suggested as a particularly useful tool in preserving California's native bunchgrasses, and it is often assumed to benefit these species. However, while prescribed burning has been used in California's grasslands for years with some observed success, little is known about the specific effects this method may yield, and published research has shown inconsistent effects for both native and non-native species. We conducted a literature review and collected data on effects of prescribed burns in California with the goal of identifying when, where, and how prescribed fires may be beneficial. This review considered articles that used prescribed burning across California, in different seasons, for various target native and non-native species, and with different burn frequencies. By synthesizing these results, we aimed to determine the number of studies evaluating this method, the species for which it has been tested, and how prescribed burning could be a solution for land management. We found promising evidence in some studies that had performed prescribed burning across different seasons and over multiple years. However, other studies showed variable success for invasive species control and enhancement of native species, which could be due to differences in site conditions, timing of burns, and species composition. We concluded that prescribed burning does show promise as a management tool, but more research is needed, especially long-term studies across different seasons and sites in order to develop accurate recommendations for when and where land managers can utilize this technique for preserving California's rich grassland biodiversity.

Isabel Parada, Undergraduate Student

Oenothera Pallida ssp. Pallida are an Important Species for Testing Genetic Diversity and Breeding Systems.

Faculty Mentor: Kathryn Theiss, Biology

Oenothera is used for medicine in form of herbal supplements either in oil supplements or seed oil for treating inflammatory-related disorders such as eczema and rheumatoid arthritis and alternative medication for diabetes. Climate change can affect the evolution of Oenothera by influencing the timing of fertilization and adaptation to the biogeographic condition. This group needs to have the ability to adapt to an extreme environment with its genetic diversity and morphological variation.

Oenothera pallida ssp. pallida are pollinated by hawkmoths and sometimes bees and grow in exposed sand dunes from Washington to Utah. Our previous research shows that Oenothera pallida ssp. pallida are extremely variable with regard to the breeding system, and it is dependent on the maternal plant. However, these previous experiments sampled only 13 plants across three populations, limiting our success in the testing breeding system using hand pollination. Our goal for this year is to get 15 plants per population to be used for experimentation.

We obtained seeds from 12 populations of Oenothera pallida ssp. pallida from across its complete range. We are starting to germinate these seeds in the Spring of 2022 with a goal of having 15 plants per population to test for the breeding system. After conducting the breeding system experiments, we will use genetic markers to follow the inheritance patterns. We expect to find variation in breeding systems across the populations and the usage of the genetic markers will allow us to correlate overall genetic diversity with the breeding system.

Gavin Acosta, Undergraduate Student

A Survey of Constructed and Simulated Molecular Knots

Faculty Mentor: Carolyn Yarnall, Mathematics

In regard to the field of topology, knots are similar to their shoestring counterparts with one major difference; there are no ends, the loop is closed. These knots can be classified by their number of crossings. Knots can be manipulated to reduce the number of crossings present, but it must be done without severing the strand in question. The purpose of our study into knots is to see if any particular patterns exist amongst the knots present within certain molecules.

We are going to examine molecular knots, both physical and simulated, and categorize them by their properties. Their knot properties such as number of minimal crossings, actual crossings, strands, and templates, as well as their chirality (topological), and more will be taken into account. Their chemical properties will also be taken into account, such as the number of atoms, elements present, and chirality (chemical). Models of these knots will be manipulated to demonstrate a relationship between these properties, such as the number of strands and templates. Any noted patterns will be presented.



STUDENT RESEARCH DAY

Student Research Conference

Online Oral Abstracts

Thursday, February 17, 2022

- Health, Nutrition, and Clinical Sciences
- Behavioral and Social Sciences
- Natural Science
- Education and Social Sciences

Health, Nutrition, and Clinical Sciences

Carlos Mora, Graduate Student

Empowerment or Endangerment? An Examination of Social Media Use in Healthcare Organizations

Faculty Mentor: Rui Sun, Public Administration

Health care nonprofit organizations (HCNPOs) are organizations whose activities focus on influencing public policy regarding health, providing consultation, training, fundraising, medical treatments, and other health-related support, and conducting research on health issues. The COVID-19 pandemic has provided HCNPOs with both challenges and opportunities, for example, in terms of disseminating timely information about COVID-19 and combating misinformation, addressing patients' concerns and providing healthcare services safely and efficiently during the lockdown. Social media as a two-way communication tool could play a vital role in addressing these challenges.

This study aims to identify the social media strategies used by HCNPOs during the COVID-19 pandemic. The research questions are: (1) How does the pandemic influence the integration of social media in HCNPOs? (2) Does social media improve the organizational effectiveness of HCNPOs? (3) Does social media empower the organization's stakeholders, in particular, the public they serve?

Previous studies have summarized social media use for health-related purposes such as health interventions, health campaigns, medical education, and disease outbreak surveillance (Chen & Wang, 2021). However, most studies focused on health care professionals, patients, and the public, rather than from an organizational perspective. This study intends to fill the research gap by analyzing a survey conducted on 100 HCNPOs in California.

The survey questionnaire includes 30 multiple-choice and open-ended questions. Data are analyzed using mixed methods. The regression analysis uses the effectiveness of social media use as the dependent variable, social media marketing strategies as the independent variable of primary interest, and other characteristics of the organizations as control variables. In addition, responses from the open-ended questions are analyzed using a qualitative approach. The findings will not only contribute to both the public administration and marketing literature but also provide valuable resources for nonprofit leaders.

Christine Field, Nicholas Fernando, Graduate Student

Exploring Culture Misconception and Fear of Retribution as Barriers to Reporting Elder Abuse Among Undergraduate and Graduate Nursing Students

Faculty Mentor: Sally Mahmoud, Nursing

Health care nonprofit organizations (HCNPOs) are organizations whose activities focus on influencing public policy regarding health, providing consultation, training, fundraising, medical treatments, and other health-related support, and conducting research on health issues. The COVID-19 pandemic has provided HCNPOs with both challenges and opportunities, for example, in terms of disseminating timely information about COVID-19 and combating misinformation, addressing patients' concerns and providing healthcare services safely and efficiently during the lockdown. Social media as a two-way communication tool could play a vital role in addressing these challenges.

This study aims to identify the social media strategies used by HCNPOs during the COVID-19 pandemic. The research questions are: (1) How does the pandemic influence the integration of social media in HCNPOs? (2) Does social media improve the organizational effectiveness of HCNPOs? (3) Does social media empower the organization's stakeholders, in particular, the public they serve?

Previous studies have summarized social media use for health-related purposes such as health interventions, health campaigns, medical education, and disease outbreak surveillance (Chen & Wang, 2021). However, most studies focused on health care professionals, patients, and the public, rather than from an organizational perspective. This study intends to fill the research gap by analyzing a survey conducted on 100 HCNPOs in California.

The survey questionnaire includes 30 multiple-choice and open-ended questions. Data are analyzed using mixed methods. The regression analysis uses the effectiveness of social media use as the dependent variable, social media marketing strategies as the independent variable of primary interest, and other characteristics of the organizations as control variables. In addition, responses from the open-ended questions are analyzed using a qualitative approach. The findings will not only contribute to both the public administration and marketing literature but also provide valuable resources for nonprofit leaders.

Jennifer Robbins, Andie Cano, Monica Craft, Catherine Cummings, Graduate Student

Occupational Justice for Women Survivors of Intimate Partner Violence

Faculty Mentor: Sheryl Ryan, Occupational Therapy

Intimate partner violence (IPV) is a public health matter entailing various forms of abuse, predominantly affecting women. Two types of social institutions engage with IPV women survivors, government agencies and community-based organizations. We designed this study to explore how these interactions either facilitate or impede meaningful participation in life and wellbeing. Researchers utilized a qualitative narrative approach with two study participants who were interviewed. Interview transcripts were analyzed by the researchers who then met to distill the following themes: met and unmet needs, trauma-informed approach, establishing safety, impact on roles, community support, and access to resources. In general, government agencies failed to approach survivors with an understanding of the dynamics of abusive relationships and often failed to respond appropriately, endangering survivors and negatively impacting their mental health and meaningful roles in life. Community-based organizations, such as domestic violence shelters, were effective in providing for physical needs, a sense of community and access to resources, however they also at times did not do enough to support survivors with the mental health care and resources they needed. These gaps are spaces in which occupational therapists can help to ensure justice for survivors by promoting their ability to partake fully in safe and healthy lives via universal, group, and individualized interventions. These include advocacy for trauma informed approaches, ensuring access to resources, and bridging the gaps between the needs of IPV survivors and the services that they employ.

Rebecca Moore, Yevgeny Medalle, Rachel Lee, Graduate Student

Exploring Occupational Participation in LGBTQIA+ Individuals Following the Coming Out Process: A Narrative Study

Faculty Mentor: Sheryl Ryan, Occupational Therapy

Positive and negative outcomes result from disclosure of gender and sexual identity, as experienced by the LGBTQIA+ population. There is a lack of research with this population and their ability to participate in meaningful activities after coming out.

Purpose: This study aimed to explore the effects of disclosing sexual and gender identity on participation in meaningful activities.

Methods: This qualitative narrative study was conducted with 8 participants through Zoom. Photo elicitation and participant responses to interview questions were analyzed into codes and formed into themes.

Results: Themes included experiences before and after coming out, engaging in activities to process or distract, relying on peer support, feeling free to participate in meaningful activities, conflicting ideals, and changes in identity acceptance.

Discussion: Coming out did not influence participants' abilities to engage in meaningful activities, however changes in perspectives, identity, and contexts were noted. Occupational therapists can help LGBTQIA+ individuals navigate negative outcomes of coming out through meaningful activities.

Behavioral and Social Sciences

Jennyfer Ibarra, Undergraduate Student

Southern California ESL High School Teachers: Examining Curriculum Placement and Implicit Bias with Latinx ESL Students

Faculty Mentor: Alfredo Gonzalez, Chicana and Chicano Studies

This study measures how public high school educators in Southern California are conducting curriculum placements for immigrant-origin Latinx students. These programs may include general courses as well as English as Second Language (ESL) curriculum programs. Using Grounded Theory, a methodology used to construct a theory through the data analysis, this study utilizes qualitative interviews with educators to better understand how ESL students are placed into these programs and therefore provide adequate support for students to enter general courses. Additionally, this study employs an Implicit Association Test to measure the bias that educators may have towards students. The study is in the data collection phase and is conducted remotely through the Zoom application. Initial findings include four participants that have shown an extent of implicit bias through the IAT. Findings also include that the rationale of placement comes through the high school institution through a form filled out by the parents. The study provides insight on how immigrant-origin Latinx adolescents are perceived by public school educators in Southern California.

Maria De La Toree, Undergraduate Student

E-cigarette Reduces Apoptosis in Prolonged Latent Breast Tumors

Faculty Mentor: Shehla Pervin, Biology

Electronic Cigarettes, also known as E-Cig or Vapes were launched into the retail market in 2007 as a potential benefit or alternative for cigarette smokers to stop their addiction. E-Cigarettes are battery-powered devices that heat liquids to an aerosol to deliver stimulant nicotine to users without any burning. Since they were introduced E-cigarettes have become accepted amongst all ages, but have become increasingly more popular among youth. (1) Additionally, many studies have shown that the effect of e-cigarettes is similar to that of traditional smoking on multiple organ systems and diverse cell types. Traditional cigarette smoking is known to contribute to the progression of various cancers including breast cancer. A study conducted by k. Pham showed that e-cigarette with nicotine could reduce apoptosis and increase the metastatic potential of triple-negative breast cancer. Breast cancer is not only a single disease, it is heterogeneous with many subtypes where many different cells play a role in its development. Triple-negative breast cancer is an aggressive and heterogeneous subtype of breast cancer with low survival rates and has poor clinical outcomes. In this study, we show the effects of e-cigarette with and without nicotine on triple-negative breast cancer cell lines MDA-MB-468 and HCC70 using a xenograft model. The MDA-MB-468 cell lines have shown an increased rate of apoptosis and prolonged latency. Most interestingly, xenografts exposed to the e-cigarette with and without nicotine have shown reduced levels of apoptosis and increased growth compared to saline control. Our results indicated that in MDA-MB-468 cell lines, e-cigarette switched pro-apoptosis to anti-apoptosis via the activation of two key genes CFLAR (CASP8 and FADD-like apoptosis regulator) and XIAP (X-linked inhibitor of apoptosis). However, fast-growing HCC70 xenos did not show a significant change in their expression levels with vapor exposure.

Yesenia Gonzalez, Undergraduate Student
Impacts of Racism and Discrimination on Mental Health
Faculty Mentor: Giacomo Bono, Psychology

Racism has been described as a hierarchical ideology used to classify and rank social groups to enforce white supremacy (Bonilla-Silva, 1996). Different treatment (discrimination) toward people of color, has been found to affect victims' health (Williams, 2018; Williams & Mohammed, 2013).

The study examines the impacts of racism and discrimination on mental health outcomes (stress, anxiety, and depression) among Latinx, Asian, and Black college students. College students (N = 156) took a survey to examine different behaviors and the impacts of discrimination on mental health. We used part of the sample to create approximately equal size groups for each of the racial/ethnic groups. We analyzed whether White students experience less discrimination than minority students during the pandemic and whether experiences of discrimination predict mental health outcomes more for minority students than white students.

Claudia Blandino, Undergraduate Student
First-Year Pandemic: Virtual Learning Experiences In the K-12 System
Faculty Mentor: Corina Diaz, Sociology

The research that I conducted was to capture the perception of virtual learning through the parents perspective during the beginning of the pandemic in 2020-21 period. The way I was able to conduct my research was by interviewing 10 subjects with a set of questioning in which different demographics were incorporated and different school districts as well. My research was completed in November 2021 and presented my completed work in the California Sociological Association Annual Conference on November 12.

Lauren Castillas, Undergraduate Student
A New Wave of Linguistics
Faculty Mentor: Iara Mantenuto, Education

This study assesses the current teaching of linguistics at the high school level (Bucholtz et al. 2015, Lidz & Kronrod 2014, Loosen 2014, McKee et al. 2015, Plackowski 2020) proposes an alternative curriculum that centers the experiences and the communities of the student population. A relevant introductory linguistics course is essential for high schools because students learn how language is a core element of human development and identity. Contrary to current research (Larson et al. 2019), which proposes a survey introductory linguistics course centered on syntax, morphology, phonetics, phonology, semantics, and pragmatics; this study highlights the importance of social and cultural aspects of linguistics and why they are crucial for first-year high school students, such as introduction to linguistics, history of language, language acquisition, sociolinguistics, raciolinguistics, educational linguistics, careers in linguistics, and computational linguistics are more attractive to K-12 students.

The presentation (i) addresses previous proposals (ii) presents an alternative curriculum rooted in raciolinguistics ideology by exposing students to a variety of languages and languages that are associated with their identity; eliminating "subtractive approaches to language diversity" (Flores & Rosa., 2015, p. 150). Subtractive approaches are different ways of controlling language diversity in classrooms by increasing competence in Standard English (Flores & Rosa, 2015). Thus, a curriculum must value diverse linguistic backgrounds to achieve educational justice. The developed introductory linguistics curriculum is divided into three central units, providing the teaching objectives, enabling objectives, topics for each lesson, assignments, assessments, and materials. Finally, the presentation (iii) offers a portfolio for high schools and an outreach plan.

This study advocates the importance of teaching linguistics in a manner relevant to the students by centering their identities and lived experiences with hands-on experience studying Language, giving them the opportunity to learn already in high school about a growing field with a 9.6%+ employment in SoCal.

Natural Science

Kristen Clerre Rafanan, Graduate Student

The Particle Size and Shape of Hydroxyapatite in the Presence of Fish Antifreeze Protein and Chondroitin Sulfate

Faculty Mentor: Sen Wang, Chemistry and Biochemistry

Drugs for osteoporosis include estrogens, selective estrogen modulators, and bisphosphonates. Concerns have been raised about serious side effects from the long time term use of the above drugs. We will explore the effect on the hydroxyapatite crystal (the model of bone) morphology in the presence of the combination of antifreeze protein and chondroitin sulfate at different molar ratios and concentrations. The effect from the different molar ratios and concentrations of the mixture has been also studied. The molar ration of 1 vs 6 combinations of the fish antifreeze protein ($2.0 \times 10^{-6}M$) and chondroitin sulfate can greatly decrease spaces in the honeycomb for osteoporosis as a potential drug. Our results will provide valuable insights into the mechanism of the key additives for biominerals and bring new osteoporosis drugs with the least side effects.

Alexis Widmann, Graduate Student

Corona Coloration of Encelia Farinosa

Faculty Mentor: Sonal Singhal, Biology

Encelia farinosa, commonly known as the brittlebush plant, is a plant found in Mexico and the southwestern states of the United States. *E. farinosa* has been found to exhibit a variation in coloration of the corona in different geographical environments. In the southern region of California, *E. farinosa* has a yellow corona. Into Mexico, *E. farinosa* is found to have a brownish black corona. Using a genetic dataset of 46 individuals of *E. farinosa* and field observations of 112 localities, we are exploring the genetic basis for this color variation and the environmental factors that maintain it. Our study will help us understand the genetic basis and potential adaptive role of corona color in *E. farinosa*.

Our field observations have been compiled into 15 geographic groups based on geographic similarities. The 15 geographic groups displayed a gradual transition from yellow corona *E. farinosa* in southern California to black corona *E. farinosa* across the Mexican border. A two population hypothesis best fits the initial genetic data.

Future work will construct principal component analysis of the genetic variation of our 46 individuals. The results of this analysis will help us further understand how genetically similar our black and yellow individuals are.

Carlos Zuniga, Undergraduate Student

Examining Genetic Signatures Fast and Slow Growing Tumors in African American Triple-Negative Breast Cancer

Faculty Mentor: Shehla Pervin, Biology

Tumor initiation and progression is a complex process involving many complex mechanisms among which pro-inflammatory interactions appear to be clinically significant. These interactions brought meaningful attention to these complex molecular crosstalks between tumor cells and the host's immune cells in the microenvironment. Stark genetic differences between two African American Triple Negative Breast Cancer cell lines, MDA-MD-468 and HCC70, were suggested by our in vivo studies. We found that MDA-MB-468 displayed slow growth phenotype and HCC70 displayed a more aggressive phenotype that resulted in accelerated tumor growth. We analyzed xenograft tissue morphology via immunohistochemistry and immunofluorescence. We also examined the expression of pro-inflammatory secretions via immunoblot analysis and RNA sequencing. Upregulation of MCSCs/ESCs markers coincided with more aggressive behaviors in tumor progression. Where we observed upregulation in MCSCs/ESCs markers in HCC70 xenografts and reduced expression in MDA-MB-468 xenografts. We also observed pro-tumor activities in HCC70 xenografts such as immune evasion. These observations highlight the tumor microenvironment as a path to determine key immune or pro-inflammatory players from both cancer and host origins that may promote immune evasion from infiltrating cytotoxic T-lymphocytes for accelerated tumor progression. To understand whether the tumor cells are the main driver of aggressive phenotype, or both tumor cells and host are required for tumor-promoting inflammation to drive progression. Our lab's commitment is to further characterize these key protein secretions and receptors that play an essential role in eliciting an immune response for both anti-tumor and tumor-promoting activities for tumorigenesis.

Arman Izadifar, Undergraduate Student

Digital Forensics

Faculty Mentor: Mohsen Beheshti, Computer Science

With digitization, opportunities for cybercrimes have increased. Digital forensics gathers digital evidence from cybercrime. This evidence, if not authentic and accurate, is inadmissible in court. Secondly, the advancements in information technology have strengthened anti-forensic techniques.

The study comprises two parts. It surveys literature to study digital forensics technology. It highlights the types of cybercrimes, digital forensic tools (hardware/software), and techniques used. It explores the strengths, weaknesses, legal issues, and challenges it faces fighting cybercrime. The second part of the study performs a forensic analysis of two cybercrime scenarios. The underlying aim is to cover all the steps of the digital forensic process i.e. data collection, analysis, and presentation. One scenario involves using the pre-existing digital forensic tools to perform the analysis. The second scenario involves building a tool customized to help an ongoing investigation.

When online, the perpetrator's history, documents, and media files downloaded get stored on the device. Existing forensic tools are for general purposes. Their performance depends on how well their technique coincides with the case needs. Sometimes, tools can be created for a specific analysis scenario. Secondly, when the data to process is huge, it is helpful to utilize artificial intelligence techniques instead of manual processing. For instance, data from social networking sites can be analyzed faster with sentiment analyzers.

Digital forensics is a reliable technology that is used in courts to prove the guilt or innocence of a cyber-criminal. Digital evidence presented must be valid, accurate, authentic, and convincing. The investigators, prosecutors, and judges must have the required technical skills.

Education and Social Sciences

Maria Torres Graduate Student

Waiting for Education Desegregation? How to Drop Out Factories Produce Juveniles into Prison

Faculty Mentor: Jen Stacy, Liberal Studies

Education in America has been established as the stepping-stone to more significant opportunities, social mobility, and opportunities into an established career. For several students, a path to college starts with which track system the school offers (AP, AVID, GATE, Magnet classes, etc) and the school's zip code, which determines school funding. Wealthier neighborhoods equal well-funded schools that track students into successful ivy league colleges and create several opportunities for successful students. Nonetheless, these elite-rated schools are in affluent areas with a high percentage of White students privileged to earn an educational journey filled with opportunities for success. On the other hand, only a tiny percentage of students of color in lower-income neighborhoods struggle to get tracked into college preparation classes, and a high percentage of lower-income students of color end up in regular classes or behavioral classes, which starts the molding of the “throwaway child,” which are the students pushed through each grade level knowing less and less throughout the years; thus, leading into the school to prison pipeline. In this research, I will analyze the continued education segregation using the critical race theory framework, illustrating how segregation has led to drop-out factories that produce juveniles into the prison system. This research will incorporate the history of America’s educational reforms, racial and class inequalities in American education, and the steps of the school-to-prison pipeline (STPP) that have left students of color helpless to the system. Finally, I offer the results of scholars committed to advocacy in breaking the cycle of drop-out factories and interrupting the flow of young Black and Brown students who are heading into the pipeline.

Casey Caprioglio, Graduate Student

The Mental Health of Medical Interns during the COVID-19 Pandemic: A Mixed Methods Analysis of Gender and Institutional Failures

Faculty Mentor: Kelin Li, Sociology

The purpose of this study was to determine what role, if any, gender had played in the mental health of medical interns during the COVID-19 pandemic. This is a mixed-methods study comprised of secondary survey data from the Intern Health Study conducted by the University of Michigan and primary interview data of two medical interns in 2020. Quantitative data from the 2019 and 2020 cohorts were analyzed using SPSS, and qualitative data were analyzed using thematic coding and analysis. This study shows that the pandemic may exacerbate the mental health disparity along gender lines but not to the extent hypothesized. More important institutional factors, such as familial support in day-to-day tasks and hospital conditions for interns and residents, have been more influential than gender during the pandemic. More research is needed to observe the long-term mental health effects of the COVID-19 pandemic on medical interns.

Norah Alnassar, Graduate Student

An Investigation of Saudi English Second Language Students' Acquisition Prepositions

Faculty Mentor: Iara Mantenuto, Education

English as a Second Language students face some difficulties when they try to choose appropriate preposition to use in a sentence (Celce-Murcia 1983). Shakir & Yassen's (2015) preposition study among Iraqi students indicated that the main reason for all the errors is the dominance of the mother tongue (Iraqi Arabic) on the English Language (EL), in particular because of the syntactic mapping of Arabic on EL. Differently from Shakir & Yassen (2015) this study looks closely to the acquisition of Saudi Arabia's Arabic; moreover, it investigates whether the age of acquisition has an impact on the adult proficiency level of use of the prepositions in EL speakers. Following Lenneberg's (1967) critical period hypothesis that language acquisition is an example of biologically constrained learning and that takes place between the age of 2 and puberty, this study investigates whether Saudi EL learners acquiring English prepositions before the critical period perform better than Saudi EL learners acquiring them after the critical period. 103 Saudi Arabic participants took an online questionnaire based on 40 items: 10 multiple choice items, 20 true or false items and 10 socio-linguistic questions. Results indicated the early acquisition age plays a significant role in reducing errors in EL especially when the syntactic grammatical structure of Arabic is superimposed on English. The results also inform the way we might want to approach EL students when teaching them EL and when discussing with them how to overcome some of the difficulties that they face when learning English.

Kelsie Traylor, Graduate Student

CRT and the Fight for K-12 Education

Faculty Mentor: Katy Pinto, Sociology

Critical Race Theory or CRT has become the Boogeyman in the minds and conservations of Republicans, and CRT is coming to wreak havoc on the K-12 educational system. Republicans are against CRT being taught to children in the K-12 educational system, and they have made it public enemy number one as it relates to educating children. . Kimberle Crenshaw (1981-prsent), Dr. Cornell West (1973-present), Nikole Hannah-Jones (1998-present), Derrick Bell (1952-2011) and Richard Delgado (1974-present) are all CRT scholars who have thoroughly studied the theory. Nikole Hannah-Jones who has spearheaded this campaign to implement CRT into education and is responsible for the creation of the 1619 Project (Hannah-Jones, 2021). The 1619 Project aims to tell a more detailed version of US History and chattel slavery (Hannah-Jones, 2021). Hannah-Jones believes that the 1619 Project can be used in addition with any history curriculum, to thoroughly teach US History. Hannah-Jones has used qualitative methods to conduct her research and has also reached out to other scholars on the topic of CRT. Some limitations with Hannah-Jones' research is that it is not quantitative, and does not offer any statistical data, to back up the claims that she and others who have contributed to this specific research. The way that I will collect my data is through qualitative interviews with five participants. Each of these participants have expressed that they are willing to contribute to my overall research and are enthusiastic to do so. The findings from this research is the conservatives and Republicans do not want CRT being taught because, it will prove that the U.S. was built on the backs of African Americans and continues to treat African Americans wrong. African Americans have been subjected to the mistreatment of those who uphold white supremacist ideas, which were created by our nation's founding fathers, and upheld by the institutions that the founding fathers have created. Those same white supremacist ideals are still being upheld by institutions, conservatives, and Republican political officials.



STUDENT RESEARCH DAY

Student Research Conference

Online Oral Abstracts

Thursday, February 17, 2022

- Health, Nutrition, and Clinical Sciences
- Behavioral and Social Sciences
- Natural Science
- Education and Social Sciences

Health, Nutrition, and Clinical Sciences

Carlos Mora, Graduate Student

Empowerment or Endangerment? An Examination of Social Media Use in Healthcare Organizations

Faculty Mentor: Rui Sun, Public Administration

Health care nonprofit organizations (HCNPOs) are organizations whose activities focus on influencing public policy regarding health, providing consultation, training, fundraising, medical treatments, and other health-related support, and conducting research on health issues. The COVID-19 pandemic has provided HCNPOs with both challenges and opportunities, for example, in terms of disseminating timely information about COVID-19 and combating misinformation, addressing patients' concerns and proving healthcare services safely and efficiently during the lockdown. Social media as a two-way communication tool could play a vital role in addressing these challenges.

This study aims to identify the social media strategies used by HCNPOs during the COVID-19 pandemic. The research questions are: (1) How does the pandemic influence the integration of social media in HCNPOs? (2) Does social media improve the organizational effectiveness of HCNPOs? (3) Does social media empower the organization's stakeholders, in particular, the public they serve?

Previous studies have summarized social media use for health-related purposes such as health interventions, health campaigns, medical education, and disease outbreak surveillance (Chen & Wang, 2021). However, most studies focused on health care professionals, patients, and the public, rather than from an organizational perspective. This study intends to fill the research gap by analyzing a survey conducted on 100 HCNPOs in California.

The survey questionnaire includes 30 multiple-choice and open-ended questions. Data are analyzed using mixed methods. The regression analysis uses the effectiveness of social media use as the dependent variable, social media marketing strategies as the independent variable of primary interest, and other characteristics of the organizations as control variables. In addition, responses from the open-ended questions are analyzed using a qualitative approach. The findings will not only contribute to both the public administration and marketing literature but also provide valuable resources for nonprofit leaders.

Christine Feld, Nicholas Fernando, Graduate Student

Exploring Culture Misconception and Fear of Retribution as Barriers to Reporting Elder Abuse Among Undergraduate and Graduate Nursing Students

Faculty Mentor: Sally Mahmoud, Nursing

According to the National Council on Aging (2021), one in every ten Americans aged 60 and up has experienced a form of elder abuse, with estimates of up to five million elderly being abused yearly. Additionally, one study found that only one in twenty-four cases of abuse is reported to authorities (National Council on Aging, 2021). Moreover, mandated reporters, including registered nurses, may be hesitant to report elder abuse, for fear of misinterpreting various cultural practices as abuse. The purpose of this study is to explore whether cultural misconceptions and fear of retribution are identified barriers to reporting elder abuse to the authorities.

A cross-sectional, descriptive, quantitative design using a convenience sample of 107 nursing students from the undergraduate (68%) and graduate (32 %) nursing programs at Cal State University Dominguez Hills. Students voluntarily completed a 46-question online survey during Spring-Fall, 2021.

Based on the survey results, 42% of students responded (agree and strongly agree) that they have a fear of reporting elder abuse due to cultural practices and misunderstanding. Moreover, 20% of students reported fear of retribution from the abuser if they reported their findings to the authorities. While 87% of participants perceived elder abuse as a problem in the United States, the results formulate the basis for further analysis into the understanding of the phenomenon of the under-reported cases of elder abuse.

Based on the study results, it is proposed that conducting analysis between barriers of reporting elder abuse and cultural misconception can yield further understanding into the under-reporting nature of elder abuse. Nursing schools can include specific elder abuse assessment education and training. This implementation can address barriers to reporting and create assessment questions to help rule out misconception in cultural practice."

Jennifer Robbins, Andie Cano, Monica Craft, Catherine Cummings, Graduate Student

Occupational Justice for Women Survivors of Intimate Partner Violence

Faculty Mentor: Sheryl Ryan, Occupational Therapy

Intimate partner violence (IPV) is a public health matter entailing various forms of abuse, predominantly affecting women. Two types of social institutions engage with IPV women survivors, government agencies and community-based organizations. We designed this study to explore how these interactions either facilitate or impede meaningful participation in life and wellbeing. Researchers utilized a qualitative narrative approach with two study participants who were interviewed. Interview transcripts were analyzed by the researchers who then met to distill the following themes: met and unmet needs, trauma-informed approach, establishing safety, impact on roles, community support, and access to resources. In general, government agencies failed to approach survivors with an understanding of the dynamics of abusive relationships and often failed to respond appropriately, endangering survivors and negatively impacting their mental health and meaningful roles in life. Community-based organizations, such as domestic violence shelters, were effective in providing for physical needs, a sense of community and access to resources, however they also at times did not do enough to support survivors with the mental health care and resources they needed. These gaps are spaces in which occupational therapists can help to ensure justice for survivors by promoting their ability to partake fully in safe and healthy lives via universal, group, and individualized interventions. These include advocacy for trauma informed approaches, ensuring access to resources, and bridging the gaps between the needs of IPV survivors and the services that they employ.

Rebecca Moore, Yevgeny Medalle, Rachel Lee, Graduate Student

Exploring Occupational Participation in LGBTQIA+ Individuals Following the Coming Out Process: A Narrative Study

Faculty Mentor: Sheryl Ryan, Occupational Therapy

Positive and negative outcomes result from disclosure of gender and sexual identity, as experienced by the LGBTQIA+ population. There is a lack of research with this population and their ability to participate in meaningful activities after coming out.

Purpose: This study aimed to explore the effects of disclosing sexual and gender identity on participation in meaningful activities.

Methods: This qualitative narrative study was conducted with 8 participants through Zoom. Photo elicitation and participant responses to interview questions were analyzed into codes and formed into themes.

Results: Themes included experiences before and after coming out, engaging in activities to process or distract, relying on peer support, feeling free to participate in meaningful activities, conflicting ideals, and changes in identity acceptance.

Discussion: Coming out did not influence participants' abilities to engage in meaningful activities, however changes in perspectives, identity, and contexts were noted. Occupational therapists can help LGBTQIA+ individuals navigate negative outcomes of coming out through meaningful activities.

Behavioral and Social Sciences

Jennyfer Ibarra, Undergraduate Student

Southern California ESL High School Teachers: Examining Curriculum Placement and Implicit Bias with Latinx ESL Students

Faculty Mentor: Alfredo Gonzalez, Chicana and Chicano Studies

This study measures how public high school educators in Southern California are conducting curriculum placements for immigrant-origin Latinx students. These programs may include general courses as well as English as Second Language (ESL) curriculum programs. Using Grounded Theory, a methodology used to construct a theory through the data analysis, this study utilizes qualitative interviews with educators to better understand how ESL students are placed into these programs and therefore provide adequate support for students to enter general courses. Additionally, this study employs an Implicit Association Test to measure the bias that educators may have towards students. The study is in the data collection phase and is conducted remotely through the Zoom application. Initial findings include four participants that have shown an extent of implicit bias through the IAT. Findings also include that the rationale of placement comes through the high school institution through a form filled out by the parents. The study provides insight on how immigrant-origin Latinx adolescents are perceived by public school educators in Southern California.

Maria De La Toree, Undergraduate Student

E-cigarette Reduces Apoptosis in Prolonged Latent Breast Tumors

Faculty Mentor: Shehla Pervin, Biology

Electronic Cigarettes, also known as E-Cig or Vapes were launched into the retail market in 2007 as a potential benefit or alternative for cigarette smokers to stop their addiction. E-Cigarettes are battery-powered devices that heat liquids to an aerosol to deliver stimulant nicotine to users without any burning. Since they were introduced E-cigarettes have become accepted amongst all ages, but have become increasingly more popular among youth. (1) Additionally, many studies have shown that the effect of e-cigarettes is similar to that of traditional smoking on multiple organ systems and diverse cell types. Traditional cigarette smoking is known to contribute to the progression of various cancers including breast cancer. A study conducted by k. Pham showed that e-cigarette with nicotine could reduce apoptosis and increase the metastatic potential of triple-negative breast cancer. Breast cancer is not only a single disease, it is heterogeneous with many subtypes where many different cells play a role in its development. Triple-negative breast cancer is an aggressive and heterogeneous subtype of breast cancer with low survival rates and has poor clinical outcomes. In this study, we show the effects of e-cigarette with and without nicotine on triple-negative breast cancer cell lines MDA-MB-468 and HCC70 using a xenograft model. The MDA-MB-468 cell lines have shown an increased rate of apoptosis and prolonged latency. Most interestingly, xenografts exposed to the e-cigarette with and without nicotine have shown reduced levels of apoptosis and increased growth compared to saline control. Our results indicated that in MDA-MB-468 cell lines, e-cigarette switched pro-apoptosis to anti-apoptosis via the activation of two key genes CFLAR (CASP8 and FADD-like apoptosis regulator) and XIAP (X-linked inhibitor of apoptosis). However, fast-growing HCC70 xenos did not show a significant change in their expression levels with vapor exposure.

Yesenia Gonzalez, Undergraduate Student
Impacts of Racism and Discrimination on Mental Health
Faculty Mentor: Giacomo Bono, Psychology

Racism has been described as a hierarchical ideology used to classify and rank social groups to enforce white supremacy (Bonilla-Silva, 1996). Different treatment (discrimination) toward people of color, has been found to affect victims' health (Williams, 2018; Williams & Mohammed, 2013).

The study examines the impacts of racism and discrimination on mental health outcomes (stress, anxiety, and depression) among Latinx, Asian, and Black college students. College students (N = 156) took a survey to examine different behaviors and the impacts of discrimination on mental health. We used part of the sample to create approximately equal size groups for each of the racial/ethnic groups. We analyzed whether White students experience less discrimination than minority students during the pandemic and whether experiences of discrimination predict mental health outcomes more for minority students than white students.

Claudia Blandino, Undergraduate Student
First-Year Pandemic: Virtual Learning Experiences In the K-12 System
Faculty Mentor: Corina Diaz, Sociology

The research that I conducted was to capture the perception of virtual learning through the parents perspective during the beginning of the pandemic in 2020-21 period. The way I was able to conduct my research was by interviewing 10 subjects with a set of questioning in which different demographics were incorporated and different school districts as well. My research was completed in November 2021 and presented my completed work in the California Sociological Association Annual Conference on November 12.

Lauren Castillas, Undergraduate Student
A New Wave of Linguistics
Faculty Mentor: Iara Mantenuto, Education

This study assesses the current teaching of linguistics at the high school level (Bucholtz et al. 2015, Lidz & Kronrod 2014, Loosen 2014, McKee et al. 2015, Plackowski 2020) proposes an alternative curriculum that centers the experiences and the communities of the student population. A relevant introductory linguistics course is essential for high schools because students learn how language is a core element of human development and identity. Contrary to current research (Larson et al. 2019), which proposes a survey introductory linguistics course centered on syntax, morphology, phonetics, phonology, semantics, and pragmatics; this study highlights the importance of social and cultural aspects of linguistics and why they are crucial for first-year high school students, such as introduction to linguistics, history of language, language acquisition, sociolinguistics, raciolinguistics, educational linguistics, careers in linguistics, and computational linguistics are more attractive to K-12 students.

The presentation (i) addresses previous proposals (ii) presents an alternative curriculum rooted in raciolinguistics ideology by exposing students to a variety of languages and languages that are associated with their identity; eliminating "subtractive approaches to language diversity" (Flores & Rosa., 2015, p. 150). Subtractive approaches are different ways of controlling language diversity in classrooms by increasing competence in Standard English (Flores & Rosa, 2015). Thus, a curriculum must value diverse linguistic backgrounds to achieve educational justice. The developed introductory linguistics curriculum is divided into three central units, providing the teaching objectives, enabling objectives, topics for each lesson, assignments, assessments, and materials. Finally, the presentation (iii) offers a portfolio for high schools and an outreach plan.

This study advocates the importance of teaching linguistics in a manner relevant to the students by centering their identities and lived experiences with hands-on experience studying Language, giving them the opportunity to learn already in high school about a growing field with a 9.6%+ employment in SoCal.

Natural Science

Kirsten Clerre Rafanan, Undergraduate Student

The Particle Size and Shape of Hydroxyapatite in the Presence of Fish Antifreeze Protein and Chondroitin Sulfate

Faculty Mentor: Sen Wang, Chemistry and Biochemistry

Drugs for osteoporosis include estrogens, selective estrogen modulators, and bisphosphonates. Concerns have been raised about serious side effects from the long time term use of the above drugs. We will explore the effect on the hydroxyapatite crystal (the model of bone) morphology in the presence of the combination of antifreeze protein and chondroitin sulfate at different molar ratios and concentrations. The effect from the different molar ratios and concentrations of the mixture has been also studied. The molar ration of 1 vs 6 combinations of the fish antifreeze protein ($2.0 \times 10^{-6}M$) and chondroitin sulfate can greatly decrease spaces in the honeycomb for osteoporosis as a potential drug. Our results will provide valuable insights into the mechanism of the key additives for biominerals and bring new osteoporosis drugs with the least side effects.

Alexis Widmann, Undergraduate Student

Corona Coloration of Encelia Farinosa

Faculty Mentor: Sonal Singhal, Biology

Encelia farinosa, commonly known as the brittlebush plant, is a plant found in Mexico and the southwestern states of the United States. *E. farinosa* has been found to exhibit a variation in coloration of the corona in different geographical environments. In the southern region of California, *E. farinosa* has a yellow corona. Into Mexico, *E. farinosa* is found to have a brownish black corona. Using a genetic dataset of 46 individuals of *E. farinosa* and field observations of 112 localities, we are exploring the genetic basis for this color variation and the environmental factors that maintain it. Our study will help us understand the genetic basis and potential adaptive role of corona color in *E. farinosa*.

Our field observations have been compiled into 15 geographic groups based on geographic similarities. The 15 geographic groups displayed a gradual transition from yellow corona *E. farinosa* in southern California to black corona *E. farinosa* across the Mexican border. A two population hypothesis best fits the initial genetic data.

Future work will construct principal component analysis of the genetic variation of our 46 individuals. The results of this analysis will help us further understand how genetically similar our black and yellow individuals are.

Carlos Zuniga, Undergraduate Student

Examining Genetic Signatures Fast and Slow Growing Tumors in African American Triple-Negative Breast Cancer

Faculty Mentor: Shehla Pervin, Biology

Tumor initiation and progression is a complex process involving many complex mechanisms among which pro-inflammatory interactions appear to be clinically significant. These interactions brought meaningful attention to these complex molecular crosstalks between tumor cells and the host's immune cells in the microenvironment. Stark genetic differences between two African American Triple Negative Breast Cancer cell lines, MDA-MD-468 and HCC70, were suggested by our *in vivo* studies. We found that MDA-MB-468 displayed slow growth phenotype and HCC70 displayed a more aggressive phenotype that resulted in accelerated tumor growth. We analyzed xenograft tissue morphology via immunohistochemistry and immunofluorescence. We also examined the expression of pro-inflammatory secretions via immunoblot analysis and RNA sequencing. Upregulation of MCSCs/ESCs markers coincided with more aggressive behaviors in tumor progression. Where we observed upregulation in MCSCs/ESCs markers in HCC70 xenografts and reduced expression in MDA-MB-468 xenografts. We also observed pro-tumor activities in HCC70 xenografts such as immune evasion. These observations highlight the tumor microenvironment as a path to determine key immune or pro-inflammatory players from both cancer and host origins that may promote immune evasion from infiltrating cytotoxic T-lymphocytes for accelerated tumor progression. To understand whether the tumor cells are the main driver of aggressive phenotype, or both tumor cells and host are required for tumor-promoting inflammation to drive progression. Our lab's commitment is to further characterize these key protein secretions and receptors that play an essential role in eliciting an immune response for both anti-tumor and tumor-promoting activities for tumorigenesis.

Arman Izadifar, Undergraduate Student

Digital Forensics

Faculty Mentor: Mohsen Beheshti, Computer Science

With digitization, opportunities for cybercrimes have increased. Digital forensics gathers digital evidence from cybercrime. This evidence, if not authentic and accurate, is inadmissible in court. Secondly, the advancements in information technology have strengthened anti-forensic techniques.

The study comprises two parts. It surveys literature to study digital forensics technology. It highlights the types of cybercrimes, digital forensic tools (hardware/software), and techniques used. It explores the strengths, weaknesses, legal issues, and challenges it faces fighting cybercrime. The second part of the study performs a forensic analysis of two cybercrime scenarios. The underlying aim is to cover all the steps of the digital forensic process i.e. data collection, analysis, and presentation. One scenario involves using the pre-existing digital forensic tools to perform the analysis. The second scenario involves building a tool customized to help an ongoing investigation.

When online, the perpetrator's history, documents, and media files downloaded get stored on the device. Existing forensic tools are for general purposes. Their performance depends on how well their technique coincides with the case needs. Sometimes, tools can be created for a specific analysis scenario. Secondly, when the data to process is huge, it is helpful to utilize artificial intelligence techniques instead of manual processing. For instance, data from social networking sites can be analyzed faster with sentiment analyzers.

Digital forensics is a reliable technology that is used in courts to prove the guilt or innocence of a cyber-criminal. Digital evidence presented must be valid, accurate, authentic, and convincing. The investigators, prosecutors, and judges must have the required technical skills.

Education and Social Sciences

Maria Torres Graduate Student

Waiting for Education Desegregation? How to Drop Out Factories Produce Juveniles into Prison

Faculty Mentor: Jen Stacy, Liberal Studies

Education in America has been established as the stepping-stone to more significant opportunities, social mobility, and opportunities into an established career. For several students, a path to college starts with which track system the school offers (AP, AVID, GATE, Magnet classes, etc) and the school's zip code, which determines school funding. Wealthier neighborhoods equal well-funded schools that track students into successful ivy league colleges and create several opportunities for successful students. Nonetheless, these elite-rated schools are in affluent areas with a high percentage of White students privileged to earn an educational journey filled with opportunities for success. On the other hand, only a tiny percentage of students of color in lower-income neighborhoods struggle to get tracked into college preparation classes, and a high percentage of lower-income students of color end up in regular classes or behavioral classes, which starts the molding of the “throwaway child,” which are the students pushed through each grade level knowing less and less throughout the years; thus, leading into the school to prison pipeline. In this research, I will analyze the continued education segregation using the critical race theory framework, illustrating how segregation has led to drop-out factories that produce juveniles into the prison system. This research will incorporate the history of America’s educational reforms, racial and class inequalities in American education, and the steps of the school-to-prison pipeline (STPP) that have left students of color helpless to the system. Finally, I offer the results of scholars committed to advocacy in breaking the cycle of drop-out factories and interrupting the flow of young Black and Brown students who are heading into the pipeline.

Casey Caprioglio, Graduate Student

The Mental Health of Medical Interns during the COVID-19 Pandemic: A Mixed Methods Analysis of Gender and Institutional Support

Faculty Mentor: Kelin Li, Sociology

The purpose of this study was to determine what role, if any, gender had played in the mental health of medical interns during the COVID-19 pandemic. This is a mixed-methods study comprised of secondary survey data from the Intern Health Study conducted by the University of Michigan and primary interview data of two medical interns in 2020. Quantitative data from the 2019 and 2020 cohorts were analyzed using SPSS, and qualitative data were analyzed using thematic coding and analysis. This study shows that the pandemic may exacerbate the mental health disparity along gender lines but not to the extent hypothesized. More important institutional factors, such as familial support in day-to-day tasks and hospital conditions for interns and residents, have been more influential than gender during the pandemic. More research is needed to observe the long-term mental health effects of the COVID-19 pandemic on medical interns.

Norah Alnassar, Graduate Student

An Investigation of Saudi English Second Language Students' Acquisition Prepositions

Faculty Mentor: Iara Mantenuto, Education

English as a Second Language students face some difficulties when they try to choose appropriate preposition to use in a sentence (Celce-Murcia 1983). Shakir & Yassen's (2015) preposition study among Iraqi students indicated that the main reason for all the errors is the dominance of the mother tongue (Iraqi Arabic) on the English Language (EL), in particular because of the syntactic mapping of Arabic on EL. Differently from Shakir & Yassen (2015) this study looks closely to the acquisition of Saudi Arabia's Arabic; moreover, it investigates whether the age of acquisition has an impact on the adult proficiency level of use of the prepositions in EL speakers. Following Lenneberg's (1967) critical period hypothesis that language acquisition is an example of biologically constrained learning and that takes place between the age of 2 and puberty, this study investigates whether Saudi EL learners acquiring English prepositions before the critical period perform better than Saudi EL learners acquiring them after the critical period. 103 Saudi Arabic participants took an online questionnaire based on 40 items: 10 multiple choice items, 20 true or false items and 10 socio-linguistic questions. Results indicated the early acquisition age plays a significant role in reducing errors in EL especially when the syntactic grammatical structure of Arabic is superimposed on English. The results also inform the way we might want to approach EL students when teaching them EL and when discussing with them how to overcome some of the difficulties that they face when learning English.

Kelsie Traylor, Graduate Student

CRT and the Fight for K-12 Education

Faculty Mentor: Katy Pinto, Sociology

Critical Race Theory or CRT has become the Boogeyman in the minds and conversations of Republicans, and CRT is coming to wreak havoc on the K-12 educational system. Republicans are against CRT being taught to children in the K-12 educational system, and they have made it public enemy number one as it relates to educating children. . Kimberle Crenshaw (1981-present), Dr. Cornell West (1973-present), Nikole Hannah-Jones (1998-present), Derrick Bell (1952-2011) and Richard Delgado (1974-present) are all CRT scholars who have thoroughly studied the theory. Nikole Hannah-Jones who has spearheaded this campaign to implement CRT into education and is responsible for the creation of the 1619 Project (Hannah-Jones, 2021). The 1619 Project aims to tell a more detailed version of US History and chattel slavery (Hannah-Jones, 2021). Hannah-Jones believes that the 1619 Project can be used in addition with any history curriculum, to thoroughly teach US History. Hannah-Jones has used qualitative methods to conduct her research and has also reached out to other scholars on the topic of CRT. Some limitations with Hannah-Jones' research is that it is not quantitative, and does not offer any statistical data, to back up the claims that she and others who have contributed to this specific research. The way that I will collect my data is through qualitative interviews with five participants. Each of these participants have expressed that they are willing to contribute to my overall research and are enthusiastic to do so. The findings from this research is the conservatives and Republicans do not want CRT being taught because, it will prove that the U.S. was built on the backs of African Americans and continues to treat African Americans wrong. African Americans have been subjected to the mistreatment of those who uphold white supremacist ideas, which were created by our nation's founding fathers, and upheld by the institutions that the founding fathers have created. Those same white supremacist ideals are still being upheld by institutions, conservatives, and Republican political officials.



STUDENT RESEARCH DAY

Student Research Conference

Roundtable Abstracts

Thursday, February 17, 2022

- Graduate Roundtable
- Undergraduate Roundtable

Graduate Roundtable

Eli Sarceno , Graduate Student

Ethnographic Roundtable Discussion

Faculty Mentor: Katy Pinto, Sociology

The research project will be based on ethnographic research from a Latino Evangelical Christian Church, with a focus on the charismatic leader. I conducted a pilot study in my ethnography class, Fall 2021; this will be my thesis proposal for graduate school. I will do the roundtable discussion in order to receive feedback, suggestions, and critiques. Max Weber defines a charismatic leader as a character, seen by a group of people, believed to have “exceptional powers or qualities...[from a] divine origin...” (1914:260). The social significance of this project is to showcase how the church is essential to the community; and how the vision executed by the charismatic leader affects the members and society. To reiterate, the following research observes one particular religious organization located in South Los Angeles; meaning that there has never been a scientific study published regarding this specific organization: CCDFR:MDZ. Weber stated that Christianity does not focus on empirical validity, rather it is considered value-judgment: faith driven ideology (1904:215). The purpose of this paper is to discuss certain characteristics of an organization: structural organization; personality of leader; membership criteria; protocols or rules; ideology; political implications; challenges; and continuity.

FIELDWORK APPROACH

Before the interview, I gathered the following: Consent form, 15 interview questions, and an Incentive. In the brainstorming process, I began freewriting and came up with 38 questions; then I highlighted the questions by dividing them into two categories: Organizational questions and self-questions. The latter focuses on the organizational structure of the religious institution, whereas the self-questions pertain to the charismatic leader. After reviewing the questions, I condensed it to about 15 direct questions: 10 regarding the organization and 5 concerning the charismatic leader; in retrospect, 15 interview questions may seem like much, but if the individual is concise then it is doable.

After constructing the questionnaire, I developed a consent form. This consent form was derived from a previous ethnographic research course, and I asked the professor for permission. The consent form provides my personal information on the center top of the page: name, graduate student, course title, semester, university, student email, and student phone number. It is then divided by six subheadings that read: what is this study about; what is required of me; what if I change my mind; is this anonymous; what if I have questions later; and what are my rights as a participant of this study. Underneath follows the signature of the research participant, as well as the pseudonym they would like to be referred as. In short, the consent form is to educate the participant about the purpose of the study, if they are willing to be recorded, and also the assurance of retracting any personal information presented.

Tanya Jimenez, Graduate Student

Homelessness Among People Incarcerated as Youth

Faculty Mentor: Rui Sun, Public Administration

Following release, formerly incarcerated individuals are more likely to experience homelessness than the general population, particularly those incarcerated before age 25. Approximately 26% of justice involved youth and young adults will experience homelessness at some point (Cox et. al, 2020). Though the risk is highest soon after release, the risk persists long after (Remster, 2019). Cox et. al (2020) explicate the link between the timing and duration of incarceration and the experience of being unhoused. One area of prior research focuses on the linkage between adverse childhood experiences (ACEs) – abuse, neglect, and household dysfunction – and later involvement in the justice system. Padgett et al. (2012) and others identify a “chain of risk”, wherein initial exposure to a traumatic event predisposes individuals to additional adverse experiences (Cox et. al, 2020). Other research focuses on a youth’s experience post-release, examining one’s transition back into free society given the stunted development of legal human capital, such as educational attainment, and social capital, including strong healthy social bonds. A correlated adversity model will be utilized, focusing on the cumulative effect of various forms of disadvantage, including social support, housing insecurity, job instability, and mental and physical health on age at first experience of homelessness post-release. As such, three policy alternatives will be discussed: trauma-informed correctional care, emphasizing trauma and how it can affect people; reentry preparation while incarcerated and support post-release, such as permanent supportive housing; and educational in-prison programs that expand human capital and one’s ability to earn a living. Analyses will focus on the State of California, given its high rate of homelessness and policies aimed specifically at furthering the rehabilitation of youth offenders, particularly the “Youthful Offender Program” (YOP). Established in 2014, the YOP expands access to rehabilitative programming for youth incarcerated before age 25, including vocational and general education programs.

Undergraduate Roundtable

Brianna Marquez, Undergraduate Student

Composting comparative analysis

Faculty Mentor: Jenney Hall, Interdisciplinary Studies

For my research project, I conducted a comparative study in order to analyze the differences and quality of the compost produced using three different types of composting technologies. This included a standard Miracle Gro tumbler, Earth Cube and Aerobin. My prediction was that the Aerobin would promote the most growth because it had the least amount of human intervention. All the food waste decomposed naturally and all it required was me simply tossing in the food. I conducted my experiment by picking up food waste from our school's dining hall every Monday and then on Wednesdays I went to the garden again to observe and fix any issues that arose. My principal findings with this experiment was that I needed to maintain a balance between the browns and greens, always cover the food waste with browns and that it's extremely important to stay consistent and follow your set schedule. To conclude, it is still an ongoing project, and I am still collecting data and writing down my observations. I intend to continue this project until my senior year. Which is where the second part of my study comes into play. I will be testing out my theory on which compost will promote the most growth by growing the same type of vegetable using the raised garden beds on the urban farm under the same conditions.

Aysa Collins, Undergraduate Student

Understanding the Experience of Black Women During Prenatal Care in Underrepresented Communities

Faculty Mentor: Enrique Ortega, Health Science

In recent years, the United States has seen an overall increase in the rates of maternal morbidity and mortality notably in underrepresented populations. Non-Hispanic Black women are at highest risk for maternal morbidity and mortality outcomes compared to other races and ethnicities. In 2019, the maternal mortality rate for non-Hispanic black women was 44.0 deaths per 100,000 live births. This was 3.5 times higher than the rate for Hispanic women, and 2.5 times higher the rate for non-Hispanic white women.

The most recent research on maternal morbidity and mortality focuses on establishing associations with prenatal care. Studies have shown that early and adequate prenatal care can considerably reduce the risk of preterm birth, and maternal morbidity. Nonetheless, when examining factors that contribute to poor maternal outcomes among non-Hispanic black women, education and income alone do not correlate with the increases in maternal morbidity and mortality. Investigations have found that prenatal care alone does not account for the poor maternal morbidity and mortality outcomes reported among non-Hispanic black women.

Culturally competent communication in prenatal care and assessment has been found to improve pregnancy outcomes by providing satisfactory care that ultimately decreases maternal morbidity and mortality rates among underrepresented populations.

My research will work to understand how culturally competent communication is associated with prenatal care and maternal outcomes among non-Hispanic Black women. These outcomes include early evaluation of mothers for medical risk and the need for psychosocial treatment, cultural barriers, and educational resources.

India Sanders, Undergraduate Student
Covid-19 and Mental Health
Faculty Mentor: Ashley Membere, Psychology

A growing concern has been observed in the psychological impact of Covid-19 on college students. Due to Covid-19, many students have been subjected to remote learning and isolation from friends and family. Both added complications of academic and work responsibilities have also furthered the anxiety of college students.

For this study, I will focus on minority college students attending Cal State Dominguez Hills to assess the effects of Covid-19 within their academic and personal lives. Secondly, to identify what additional resources need to be added or improve current resources to help existing minority students continue higher education to upward mobility.

Past studies suggest that the effects of Covid-19 greatly impacted the mental health of college students. A study was conducted with 733 college students who reported their recent stressful experiences. The hypothesis for this study showed that students without pre-existing mental health challenges showed severe signs of psychological distress during the pandemic. Another study that assessed the behavioral and emotional functioning during the pandemic also showed adverse effects on students' behavioral and emotional health during Covid-19.

A survey will need to be created detailing experiences and behaviors attributed to the pandemic assessing how students adapted to the new learning or work environments, and the impact on Covid-19 in their personal lives.

In conclusion, it is essential to consider how minority college students are affected by the pandemic and what resources are available for students dealing with the effects from Covid-19. Additionally, data will need to be collected from Cal State Dominguez Hills minority students regarding how Covid-19 has affected their college experiences, mental health, and personal lives. Additional resources and improving existing resources can be developed in conducting such research.

Jasmine Abag, Undergraduate Student
Perception Is Everything: Deconstructing Perceptions Around Mexican American Immigrant Women
Faculty Mentor: Tahereh Aghdasifar, Women's Studies

During the early 20th century, California experienced an influx of Mexican immigration. The political and economic realities in México under President Porfirio Díaz favored foreign investment and the Mexican elite's interests. This condition left ordinary Mexicans without land and no opportunities to sustain their livelihoods, forcing a continuous movement of rural people to cities searching for employment. Many settled in Los Angeles, where farming expanded on a larger scale. The Los Angeles white farm-owning elite supported and protected the flow of cheap labor from México because it was prosperous. They also thought that Mexicans would return to their country after the growing season. However, immigrants began to find permanent settlement in the city, igniting fears and angst over wellness and overpopulation amongst the Anglo-Nativists. To preserve a white Los Angeles, the first line of defense was to segregate public institutions such as public health. California soon adopted Eugenics ideology and used forced sterilizations as the acceptable way to manage the Mexican population growth. This project, utilizing Feminist theoretical frameworks, explores how and why brown bodies are viewed with discriminatory perceptions based on race, gender, class, and country of origin.

Lucero Velazco Undergraduate Student

Native Americans Resource Awareness: A Qualitative Report on How Resource Awareness Can Improve Native American's Quality of Life

Faculty Mentor: Helen Oesterheld, Education

As a data analyst intern for the development in student career readiness, I find that much due diligence is needed to develop a successful platform for a student to face the world in their chosen field competently. A particular area that interests me is Native Americans and the awareness of their resources to equip themselves to be ready for the workforce. Unfortunately, Native Americans' historical trauma and the loss of Native American Culture and Identity make for a lack of available Native Americans as candidates for the valuable resources. Nevertheless, even with the strong presence of these educational entities, the employment of Native Americans has not improved. (AL-Asfour A. 2018) This study investigates the achieved possibilities with education resources awareness to Native Americans. Resource awareness to Native Americans can have the option of healing individuals and communities since education is one source that contributes to stability and purpose, advocating opportunities for a better quality of life to the Native American Community.

Aliza Potter, Diana Aguirre, Ronald Jackson, Dwasha, Ezequiel Minero, Alexa Vasquez, Karl Lopez, Diana Robinson, Theresa, Anahi Gomez, Undergraduate Student

Making the Invisible Visible; Resilience through Awareness of Microaggressions on CSUDH students

Faculty Mentor: Monique Turner and Erin Barrett, Psychology

Although movements such as the Civil Rights Movement had a significant impact on racism, racism remains powerful and ubiquitous in the United States (Sue et al., 2007). Racism is a struggle in which people of color continue to contend. Racism is prominent in the U.S. with a Macro effect (institutional level) and a Micro effect (individual level; Solórzano & Yosso, 2007). This roundtable discussion will focus on the Racial Battle Fatigue framework (RBF), which is described as a social-psychological stress response to the cumulative experiences of racism (Dorazio et al., 2019). According to Snelling (2011), 63% of students witness microaggressions, leading to changes in their social-emotional health. The literature shows a recurring theme of how experiencing racial microaggressions in college contributes to students' mental health erosion through the racial battle fatigue theory lens. Moreover, there is a correlation between people of color's frequent experiences of microaggressions and undergoing a higher risk of depression (Torres & Taknint, 2015).

The purpose of the current study is to create awareness of situations one may have experienced in relation to systemic racism, in which microaggressions are a manifestation. Furthermore, this study aims to recognize the effects of microaggressions on students within an academic setting. The current methodology proposes utilizing anecdotal stories curated into vignettes to explore whether students can identify microaggressions. The research design focuses on the consequences of microaggressions in an academic context. Self-esteem and self-efficacy will be used as characteristics that may further influence one's self-perception and social interactions in the classroom, specifically with faculty. Students' academic performance will be one of the indicators of resilience. Researchers are interested in identifying coping mechanisms that foster the development of resilience amongst individuals who have previously experienced microaggressions. We plan to provide students with the knowledge and tools to confront and handle microaggressions effectively.



Student Research Conference

In Person Abstracts

Thursday, February 17, 2022

- Behavioral and Social Sciences
- Natural Science
- Arts and Humanities

Behavioral and Social Sciences

Angelica Nino, Myrick Nguyen, Jenna Leland, Leticia Ortiz, Graduate Student

Lived Experiences of Post-Graduates with a Family History of Mood Disorder: Examining Lifestyle Choices and Occupational Engagement

Faculty Mentor: Sheryl Ryan, Occupational Therapy

Risks of developing mood disorders increase with a family history and during life changes. This study seeks to understand how the awareness of these risks impacts the lifestyle choices of newly graduated individuals. Methods This qualitative study included four recent graduates with a family history of a mood disorder. The case study approach utilized an interview, a photo-elicitation activity, and a time use wheel activity. Results Analysis identified five emergent themes: (1) changing the environment to allow for personal growth, (2) proactively creating healthy routines, (3) navigating changing relationship dynamics, (4) engaging in leisure activities, and (5) being mindful of mental needs. Conclusion All participants engaged in preventive wellness practices. Due to a higher risk for mood disorder, this population may benefit from similar practices. OT expertise in wellness habits and lifestyle modification can play a vital role in preventive care for this population.

Therese Rafaela, Patricia Tom, Elisa Yao, Jann Ramirez, Graduate Student

Inclusion Among Ethnically Diverse Families Within an EI Pediatric Clinic

Faculty Mentor: Sheryl Ryan, Occupational Therapy

There is a lack of representation in research regarding the perspectives of minority research regarding the perspectives of minority caregivers with children with developmental disabilities/delays and occupational therapy (OT) practitioners in early intervention (EI). There is a need for inclusion among ethnically diverse families due to their multicultural context in pediatric OT. This study examines a culturally fluid pediatric clinic and how their values impact this population. Methods: This qualitative single case study conducted semi-structured interviews with 2 OT supervisors who have over 40 years of experience in interactions between minority caregivers and occupational therapists in EI. The data was analyzed through coding and thematic analysis. Results: Data analysis produced 4 themes: unconscious cultural responsiveness, investing in staff, investing in parents, and always growing. Conclusion: Clinics serving ethnically diverse families must reflect on their practices to enact changes that consider specific needs, demographics, and values of their clients and staff to cultivate an all-inclusive workspace. Changes may include abstaining from only celebrating common cultural holidays and broadly referring to them as the “holiday season.”

Kasey Reeve, Jenny Phung, Bobby Woodcock, Graduate Student

Investigating the Formation and Maintenance of Friendships in Autistic Adolescents: A Qualitative Study Using Narrative with Photo-Elicitation

Faculty Mentor: Sheryl Ryan, Occupational Therapy

The formation and maintenance of friendships is a critical developmental milestone during adolescence. Adolescents with Autism Spectrum Disorder (ASD) experience challenges with social skills and communication as well as making and keeping friends. Purpose: This study seeks to better understand their lived experience regarding friendships. Method: Our two participants with ASD were 18-24 years of age. Using a narrative with photo-elicitation methodology, researchers conducted Zoom interviews where participants provided one photo representing how they form friendships and one representing how they maintain friendships. Results: Four themes emerged: setting, common interest, effort, and desired characteristics. Implications: The results emphasize the importance of understanding the lived experiences of autistic adolescents. Considering common interests like video games will help health practitioners to design interventions to enhance autistic adolescents' social participation.

JiWon Anh, Larissa Arakaki, Jennifer Eo, Graduate Student

Neonatal Intensive Care Unit (NICU) Experiences with Compassion Fatigue and Its Effect on Occupations

Faculty Mentor: Sheryl Ryan, Occupational Therapy

The neonatal or newborn intensive care unit (NICU) cares for extremely vulnerable and high-risk infants. However, research on NICU workers' lived experience with compassion fatigue and burnout is scarce. This narrative qualitative study used interviews and photo-elicitation to research NICU compassion fatigue and burnout. Data analysis generated four themes: (a) unique and enjoyable population, (b) factors relating to workplace burnout, creating boundaries, and (d) coping strategies for compassion fatigue. Our findings emphasize that NICU workers should be aware of compassion fatigue caused by poor workplace communication. Workplace mental health support may not be provided so we suggest that NICU workers engage in coping strategies to combat and prevent compassion fatigue. By integrating these changes into treatment, mental health services can provide a more holistic approach to maintain work-life balance and create health-promoting routines and rituals.

Ramon Ronquillo, Celine Rezvani, Chris Simmons, Khanh Phan, Graduate Student

Tattoos and Six-inch Heels: A Visual Exploration of the Meaning of Clothing for Adults with Mobility Disabilities

Faculty Mentor: Sheryl Ryan, Occupational Therapy

Because people use clothing for self-expression as well as body covering, and most clothing is made for able-bodied people, it is important to explore how clothing impacts people living with disabilities (PLWD), beyond simply posing limitations with the physical act of dressing. Our study aimed to explore the meaning of clothing for PLWD. Method: Researchers used Photovoice, a participatory action research methodology in which participants take photos in response to prompts pertaining to the research topic. 6 subjects participated in a focus group to discuss their photographic contributions. Results: Four themes emerged: (a) adaptations/innovations, (b) trade offs, (c) being excluded, and (d) breaking barriers. Conclusion: A lack of universal design in clothing forces PLWD to adapt available choices to their needs, leading to a collective feeling of exclusion. Furthermore, it was found that the meaning of clothing went beyond self-expression, as many used clothing to break barriers and dispel preconceived notions about disability.

Brandon Lawton, John Lorenzo, Sandra Ngo, Faith Ignacio Graduate Student

Experiences of Occupational Therapists Working with Unhoused Populations

Faculty Mentor: Sheryl Ryan, Occupational Therapy

With rates of homelessness rising in the United States, individuals from unhoused populations continue to experience obstacles to health and wellbeing. Occupational therapists are well-positioned to support unhoused individuals with the everyday tasks they want or need to do. However, perspectives on the nature and contribution of occupational therapy to supporting unhoused communities have been scattered. The purpose of this study was to examine the personal experiences of OT professionals working with the unhoused and explore characteristics of their roles in everyday practice, challenges they face, and factors that sustain their work. Methods: Qualitative interviews were conducted with six licensed occupational therapists who had one or more years of experience working with unhoused populations. A phenomenological approach was used to guide the study. Results: Characteristics of occupational therapists' daily work included: a) supporting client centered skills, b) supporting clients with mental health challenges, and c) interdisciplinary team dynamics. Challenges they faced involved: a) limited funding and b) clients' barriers to accessing services. Factors that sustained work included: a) having a supportive staff and b) finding emotional and moral congruence. Conclusions: In uncovering the characteristics of daily work and factors that sustain the roles of occupational therapists working with unhoused communities, this study emphasizes the importance of being comfortable with overlapping professional roles and finding supporting multidisciplinary teams for OT's and other professionals interested in pursuing community-based practice. Furthermore, limited funding and clients' barriers to accessing social and healthcare still prove to be major challenges that need to be addressed.

Tracy Bertka, Anita Kapila-Ramirez, Undergraduate Student

Morning versus Evening Exercise— What's Better for Your Diet? Evidence From an Event-Related Potential (ERP) Study

Faculty Mentor: Kaylie Carbine, Psychology

Food-related inhibitory control, or one's ability to withhold dominant responses towards desired foods, is critical for managing diet and health. Acute aerobic exercise may improve food-related inhibitory control and one's diet, but it's unclear if morning versus evening exercise has a greater effect on food-related inhibitory control. To test if time of day and exercise affect food-related inhibitory control, we measured event-related potentials (ERPs), which are changes in the brain's electrical activity in response to stimuli during an electroencephalogram (EEG). We measured the N2 and the P3 ERPs in response to food stimuli after morning and evening exercise, as these ERPs get larger when withholding dominant responses, reflecting increased inhibitory control. Method: 138 participants (M_{Age} = 25.67; 54% female) attended two sessions held a week apart, either both in the morning (7-10am; n = 71) or evening (7-10pm; n = 67). For one session they rested and the other they walked on a treadmill at 3.8mph, both for 45 minutes. After they completed two food go/no-go tasks, one where they withheld responses to high-calorie foods and the other where they withheld responses to low-calorie foods, while EEG data were recorded. Results: Separate 2-time (morning/evening) x 2 session (rest/exercise) x 2-task (high/low-calorie) ANOVAs for the N2 and P3 ERPs both showed a main effect of task, with the high-calorie task eliciting a larger inhibitory response than the low-calorie task (all ps < .001). The effect of time, exercise, and any interactions were not significant for the N2 or P3 (all ps > .063). Conclusion: Regardless of the time of day or exercise, individuals require increased recruitment of inhibitory control resources to withhold from eating high calorie compared to low-calorie foods. Future research may wish to consider other interventions (e.g., cognitive-based interventions) or health factors (e.g., sleep deprivation, BMI status) that could affect food-related inhibitory control.

Nicole Figueroa-Sierra, Undergraduate Student
Batched Notifications Reduce Smartphone Addiction
Faculty Mentor: Nancy Cheever, Communications

Previous research has assessed the impact of smartphone notifications, uncovering the negative impacts they have on one's cognitive load, smartphone usage, productivity, and attention levels (Kim, Kim, & Kang, 2016; Kushlev, Proulx, & Dunn, 2016). One study found that receiving phone notifications impairs one's attention performance, even without interacting with the device. Just seeing or hearing notifications led to distracting thoughts, mind-wandering, and task-irrelevant thoughts. While there is a copious amount of research regarding the obstructiveness of notifications, there is minimal research on how batched notifications impact smartphone use/addiction, which is the primary goal of this study. Researchers recruited 50 adult student participants from California State University, Dominguez Hills via convenience sampling. The participants resided in the United States, utilized notifications, had an Android smartphone, and were able to complete a total of three surveys, one given every two weeks. Participants were randomly assigned into two groups, one of which utilized an app called Daywise to receive batched notifications at three intervals throughout the day (9 a.m., 3 p.m., and 9 p.m.), while the control group received their notifications normally. Participants then received a link to a survey every two weeks for a month. The surveys measured their technology usage, smartphone addiction, executive functioning, attention, stress, and well-being. While 28 participants completed the first survey, only 12 completed the last survey, indicating a significant drop off rate. Of those who received the batched notifications, there was a 17% drop in those who reported high smartphone addiction between the first and last survey administrations, and a 21% increase in those reporting low smartphone addiction. For those in the control group, there was an increase of 33% who reported high levels of smartphone addiction. These results help contribute to the current literature on notifications and smartphone addiction.

Alex (Adriana) Perez, Undergraduate Student
Adoption of Distributed Energy Resources in Disadvantaged Communities and Climate Change related Challenges
Faculty Mentor: Parveen Chhetri, Earth Science

Many studies have focused on energy burdens across the United States, yet few have focused specifically on Los Angeles (LA) County. The energy infrastructure and the distribution of services are adapting to the demand for alternative forms of energy, such as photovoltaic (PV) technology (solar power), as a response to climate change and the ever-increasing demand for energy in our day-to-day lives. In order to understand how the infrastructure works we looked at the multiple components of Distributed Energy Resources (DER), which include photovoltaics, fuel cells, microturbines, batteries, energy efficiency, demand response technologies, and electric vehicles. Widespread adoption of DER is critical to California's compliance with the 100 Percent Clean Energy Act of 2018 (SB 100), which has set a goal of powering all retail electricity sold in CA with renewable and zero-carbon resources by 2045. Our study examines Disadvantaged Communities (DACs), as defined by CalEnviroScreen Cumulative Impact Score data, and explores whether there is a correlation between DACs and low integration capacity (<100 kW Uniform Generation Static Grid, obtained from Southern California Edison's Distributed Resources Plan External Portal), thereby inhibiting the adoption of DER in disadvantaged communities in Los Angeles County. Unequal access to energy infrastructure (energy generation and battery storage), can potentially cause DACs to be more vulnerable to power outages due to the rising number of significant weather events caused by climate change. To address how DACs are currently being disproportionately affected by climate change-related energy issues, we used DACs data from CalEnviroScreen and climate extreme data from Cal-Adapt to identify the most vulnerable communities associated with climate change-related energy issues. Because a large proportion of the LA County population is classified as DACs, understanding the current services available, along with the current distribution of these services, is critical to ensure that future policies and the development within these communities are arranged equitably.

Natural Science

George Contreras, Undergraduate Student

Genetic & Geographical Evidence for New Species of Notoscincus

Faculty Mentor: Sonal Singhal, Biology

The lizard species *Notoscincus ornatus* is found in Northern Australia, and it consists of two subspecies: *Notoscincus ornatus ornatus* and *Notoscincus ornatus wotjulum*. Though these two subspecies have been deemed the same species for many years, recent evidence in morphology and DNA has shown that this may no longer be true. We analyzed nuclear and mitochondrial genetic data from 20 individuals from both subspecies to determine if these two subspecies are better characterized as different species. Our nuclear DNA was acquired through Double Digest Restriction Aided Digest (ddRAD), and we used these data to create a phylogeny of these lizards. With this phylogeny, we were able to group species into clades that correlate to different geographical environments when the individuals were plotted on a map. We then looked at the mitochondrial DNA (mtDNA) for 13 individuals and analyzed their evolutionary rate through a series of molecular clocks. This allows us to create a different phylogeny that approximates a timeline from which each lizard diverged from one another. In this phylogeny, we were able to approximate the earliest time of divergence was 15.3 million years ago, while our most recent time of divergence of *Notoscincus ornatus wotjulum* is less than half a million years ago. In continuing our research, we hope to use our data to revise species boundaries in *Notoscincus ornatus*.

Benjamin Garcia Morales, Undergraduate Student

Density of Length Spectra of Natural Numbers

Faculty Mentor: Wai Yan Pong, Mathematics

decomposition of a natural number m is a sequence of consecutive natural numbers that sum to m . The length of a decomposition is the number of its terms. The spectrum of m , denoted by $\text{spec}(m)$, is the set of lengths of its decompositions. For example, 9 has three different decompositions: 9, 4+5, 2+3+4. So, $|\text{spec}(9)| = \{1,2,3\}$. The spectral class of a number m is the set of all numbers that have the same spectrum as m .

A fact that the size of a spectral class can only be 1,2 or infinite was proved by W.Y. Pong in *Length Spectral of Natural Numbers*, *International Journal of Number Theory* Vol. 05, No. 06, pp. 1089-1102 (2009). The goal of this project is to answer a natural question that arises from this result: how often one can 'guess' the number from its spectrum? The question is related to the densities of sets of numbers with a specific size of their spectral classes.

Jeisson Pulido, Undergraduate Student

Magnetic Flux Rope Reconstruction in the Heliospheric Current Sheet using Parker Solar Probe Data

Faculty Mentor: Kristoff Paulson, Physics

The Heliospheric Current Sheet (HCS) is a region of the heliosphere that contains multiple flux ropes/plasmoids generated through solar magnetic reconnection and originated from helmet streamers. Parker Solar Probe (PSP) data is used to identify a transit of vicinal flux ropes when the spacecraft navigates through the HCS. We then use the Grad-Shafranov method to solve for the impact parameter and the flux rope axis. The local orientation and thickness of the HCS is ambiguous in PSP crossings because of the single-point measurements, however, we utilize the orientation and centroid locations of several flux ropes occupying the HCS to deduce the local current sheet shape

Joshua Quiran, Undergraduate Student

Affinity Purification of Antibodies (2G8) from Endotoxins

Faculty Mentor: Teklegiorgis Ghebremariam, Biology

The purpose of this experiment is to remove pyrogens from 2G8 antibody by using Detoxi-Gel Endotoxin removal gel. This fast-small-scale affinity purification of antibodies from endotoxin removes a certain percentage of endotoxins.

Background: Endotoxins can affect many human organ systems and disrupt humoral and cellular host immunity so they must be removed to negligible amounts. The sample in this study is Anti-1, 3 beta-glucan antibody [2G8]. This antibody has been shown to be effective in multiple models of fungal diseases including vaginal and systemic Candida infection, murine invasive Aspergillosis and Cryptococcus neoformans infections. Polymixins are antibiotics that function by binding and hence neutralizing the biological activity of endotoxins. In this study we used immobilized polymixin B gel to bind and remove endotoxin.

Method: The Detoxi-gel resin was regenerated by washing with 5 resin -bed volume of 1% sodium deoxycholate, followed by 5 resin bed volume of pyrogen-free buffer then the sample was applied. The sample was then collected by a gravity flow column and the level of endotoxin was measured by using the Limulus Amebocyte Lysate Endochrome kit.

Result: After applying the 2G8 antibody on the Detoxi-Gel an ~ 43% or 0.3405 mg was recovered from the sample from 0.8 mg. The Endotoxin Units per milliliter (EU/ml) was 12,665 before cleaning and 0.15 EU/ml after.

Conclusion/summary: The FDA regulates the acceptable level of endotoxin contamination to be 0.5 endotoxin EU/ml. Thus, our purification method was successful in producing an acceptable level of endotoxin in the 2G8 antibody. The purified antibody will be tested for its efficacy in protecting against fungal infections in mice.

Kamila Trzanek, Undergraduate Student

Clinical Laboratory: Lessons Learned from COVID-19

Faculty Mentor: Payman Nasr, Clinical Sciences

COVID-19 pandemic is currently overwhelming the healthcare systems across the world. Aside from the hospitals' ICU's, clinical laboratories are also facing unprecedented demand, primarily due to the surge of testing and the urgency for rapid results turnaround time. As new assays are being implemented with increasing availability to the public, and the COVID-19 cases surge, laboratories struggle in terms of productivity and efficiency. The current report aims to identify the primary challenges facing clinical laboratories during the pandemic. Information from the CDC and other scholarly sources, as well as interviews with the laboratory personnel in the Los Angeles metropolitan were conducted to identify the obstacles in the laboratory operation during the pandemic. The analysis identifies both internal and external obstacles that presented challenges for the effective laboratory operation. As the pandemic reached its peak, the main internal challenge was to meet the staff shortage as an increasing number of staff were either in quarantine or recovering from the infection. These individuals are often highly trained and difficult to replace. Their absence contributes to a significant reduction in productivity and a slower turnaround time. Cross-training of laboratory employees in the different departments is one way to decrease the impact of unforeseen employee shortages and, in turn, to improve turnaround time and productivity. The main external challenge involved the supply chain demand for reagents and personal protective equipment. Central distribution of medical supplies at the level of the Federal government that reduces outbidding practices and ensures regular distribution of supplies deemed necessary for a prompt laboratory response. In summary, the clinical laboratory is an essential element of communicable disease surveillance; therefore, improving multidisciplinary training for the laboratory staff, as well as ways to secure the laboratory supply chain will strengthen the laboratory response in future pandemic investigations.

Arts and Humanities

Caitlin Mcclister, Undergraduate Student

American Duplicity: How the FDR Administration and American Red Cross Voluntary Aid Bypassed Millions of Jewish Refugees during World War II

Faculty Mentor: Andrea Johnson, History

World War II will forever be one of the most horrific events in our world history. 75 million people died from a large variety of causes. 6 million of those were Jewish people killed in Nazi concentration camps. For Americans, the war really started in 1941 with the bombing of Pearl Harbor. The reality is that World War II started in 1939. As information has unfolded, and the contribution of the United States in terms of aid to European Jews has come under investigation numerous times. The role of President Franklin D. Roosevelt's administration and the various American voluntary associations that were responsible for providing aid have already been researched. The International Committee of the Red Cross has also released their records, proving to be controversial with regards to their impact on victims of Nazism. Regardless, it's clear that not enough was done. My research focuses on a different aspect of this topic that has not been examined thoroughly. I will analyze how the relationship between the FDR administration and the American Red Cross directly impacted the aid given to European Jews during World War II. This will involve looking at specific individuals within President Roosevelt's administration and the American Red Cross, as well as defining the relationship based off of the correspondence between them. I hope to provide a clearer understanding what really occurred during these years, and fill in the gaps that lead to the millions of people left at the hands of Hitler and the Nazis.

Danielle J. Enriquez, Undergraduate Student

The Making of Prohibition: How Immigrants Became the Reason Prohibition was Enacted into a Law

Faculty Mentor: Kate Fawver, History

The 18th amendment was ratified in December of 1917, the ratification ultimately led to what is known as the Prohibition Era from 1920 to 1933. Prior to the year 1917, between 1890 to 1915, woman feminist groups alongside religious groups fought for a law to be enacted for legislation to end alcohol consumption. The United States was a rising nation with an influx of immigrants arriving through Ellis Island. In addition, prohibition occurred when the United States was emerging from its involvement in World War I, experiencing the roaring twenties and undergoing the beginning of the Great Depression. Immigrants were seen in a negative light, outcasted and pushed away from society because of the different languages they spoke and their looks. Prior to prohibition, women Temperance movements and organizations like the Anti – Saloon League along with other organizations advocated for the legislation to be passed prohibiting the use, sale, and manufacturing of liquor; all of which was directly correlated to immigrants.

Michelle Avila, Undergraduate Student

Depictions of Fat Women Through the Gazes of Female and Male Artists During the Baroque Period

Faculty Mentor: Kirstin L. Ellsworth, Art and Design

The female body has been a famed subject for the gazes of artists, models, and audiences. As the female body became a preferred subject, the depictions of diverse body shape diminished. As a result, western society began to uphold unrealistic beauty standards when painting women in art. Due to these unrealistic standards, the male artistic gaze presumably portrays fat women in inaccurate perspectives that demonstrate them as subjects of mockery, misrepresentation, and over-sexualization for example, as seen in paintings of the female heroine Judith. According to the apocryphal Biblical account, Judith saves her town against the ill-ridden Holofernes. Judith quickly became one of the most famous female subjects throughout art history. The depictions of Judith differ depending, to a great extent, on the artist's gender. Artists like Artemisia Gentileschi (1610–1653) strive to reject the typical male gaze to create diverse depictions of women, as seen in *Judith Slaying Holofernes* (1612-1613). Gentileschi utilizes her strengths and experiences as a woman in 17th century Italy to produce art that diminishes the portrayal of frail women. By depicting fat women in positions of power, Gentileschi delivers power to the fat female subject. This research will explore the depictions of the female body of Judith in the art of Artemisia Gentileschi and Peter Paul Rubens (1577-1640) to demonstrate the differences between the female artistic gaze and the male artistic gaze. This project argues that art created by the female artist's gaze of Artemisia Gentileschi portrays larger bodies without the alleged compartmentalized views of women's bodies conserved by the male artistic gaze. By delivering research on diverse female subjects, the narrative of what it means to be a woman in the arts, whether the subject or the artist, can shift to prove that representation matters.



Student Research Conference

Poster Abstracts

Thursday, February 17, 2022

- Behavioral and Social Sciences
- Natural Sciences
- Health, Nutrition, and Clinical Sciences

Behavioral and Social Sciences

Arrianna Lister, Anita Kapila-Ramirez, Nicole C. Figueroa-Sierra, Nicole C. Figueroa-Sierra
Undergraduate Student

Does Alcohol Recovery Identity Predict Alcohol Consequences: An Examination of Heavy Drinkers
Faculty Mentor: Kevin Montes, Psychology

Explicit drinking identity is positively associated with the number of consequences experienced. However, it is unclear whether explicit alcohol recovery identity is similarly predictive of consequences. The purpose of the study was to examine whether explicit alcohol recovery identity was predictive of negative consequences. A total of 205 adults who self-reported engaging in heavy drinking completed an online survey. After controlling for the effects of drinking identity in the prediction of the number of consequences experienced in the hierarchical regression analyses, explicit alcohol recovery identity was found to be a statistically significant predictor of consequences, $B=.80$, $p=.002$. Explicit alcohol recovery identity was found to be uniquely predictive of consequences even after controlling for explicit drink identity. Treatment programs focused on alcohol recovery may include practices that involve individuals building a stronger sense of self that is unrelated to drinking.

Lukas Daniels, Undergraduate Student

Language in Lactation Care

Faculty Mentor: Sarah Lacy, Anthropology

Exploring the plausibility, complications, and implications of transgender and gender-diverse people who lactate to feed or 'chestfeed' necessitates a biocultural approach. Transgender and gender diverse people experience greater barriers to chestfeeding, such as a lack of access to accurately informed medical information, explicit instructional materials with inclusive language, and specifically trained lactational consultants. This has adverse psychological, physical, and cultural effects. Therefore, this research analyzes the language used by the largest lactational consultant certifying organization (IBLCE) and the most widely used lactational textbook to see how practitioners are being trained to speak about lactation and "chestfeeding". This work has implications to spread awareness about the needs of transgender and gender diverse people hoping to lactate while also posing questions that need further investigation to increase recognition of and support for transgender and gender diverse peoples by lactation consultants, OBGYNs, nurses, caregivers, and their communities. Ultimately, transgender and gender diverse people have demonstrated not only the ability to, but also a desire to gestate and lactate; thus, they deserve informed and hospitable medical care when doing so. Considering the health benefits of milk and chestfeeding for child and parent, the issues raised here should be of great interest for groups hoping to expand public awareness and social support for chestfeeding and encourage those groups to target their outreach beyond cisgender women.

Aliza Potter, Undergraduate Student

Are You the Culprit?: How workplace Incivility Impacts Black LGBTQ Members

Faculty Mentor: Ashley Membere, Psychology

Workplace incivility is a problem that affects a vast majority of employees; however, most research on this issue focuses on White women's experiences with sexual harassment or POC experiences with racism. There is little research on how workplace incivility impacts Black LGBTQ individuals. This study investigates how workplace incivility affects stress levels of Black LGBTQ members and their likelihood of reporting such incidents to human resources. The negative stereotypes surrounding their Black identity, gender, and sexuality can affect their rates and reasons for reporting. Due to backlash, they will be less willing to report these negative experiences to organizational authorities. Data collection has been completed for a preliminary sample of 125 Black LGBTQ workers residing in the United States. Participants completed a survey about their experiences with various types of workplace incivility, their reporting of these acts, and their levels of stress within the last month. Preliminary analyses reveal a positive correlation between workplace incivility and perceived stress. Qualitative responses for reporting incivility and evaluation of the reporting process will be analyzed specifically for Black women, gay Black men, and Black bisexuals. Investigating this often-overlooked population will bring awareness to their experienced stress and drive further interest in analyzing how these negative effects accumulate over time and spill over into non-work domains. For organizations, this work can shed light on the silent struggle of Black LGBTQ workers and encourage the creation of policies that contribute to a healthier and more inclusive work environment.

Jennifer Hernandez, Margarita Alvarez, Undergraduate Student

Academic Function, Grit, and Covid-19

Faculty Mentor: Giacomo Bono, Psychology

Research shows that female college students have experienced greater academic harm than male college students during the COVID-19 pandemic (Prowse et al., 2021). Therefore, the current study will examine differences between male and female college students at an urban university in terms of academic functioning and satisfaction with college during the height of the Covid-19 pandemic (Fall 2020 and Spring 2021), and whether such positive coping styles help protect students in terms of academic functioning and college satisfaction. This aspect will focus on Grit along Academic Function. Implications for how universities can better support academic motivation and success among demographically diverse college students during the COVID-19 pandemic will be discussed.

Margarita Alvarez, Jennifer Hernandez, Undergraduate Student

Gender Differences in College Student's Coping Strategies and Mental Health Outcomes during the COVID-19 Pandemic.

Faculty Mentor: Giacomo Bono, Psychology

Aside from just being a medical issue, a pandemic impacts people's mental health, causing problems such as depression, anxiety, and stress (Javed et al., 2020). Research shows that adult females have experienced more psychological harm than males during the COVID-19 pandemic (Thibaut et al., 2020). Though Prowse et al. (2021) examined specific behavioral coping strategies that protected or exacerbated male and female students from the pandemic's consequences (e.g., video conferencing with family/friends, exercising, eating, and using alcohol/substances), less is known about proactive social-psychological coping strategies like positive reinterpretation and growth, active coping, planning, use of emotional social support, and religious coping) that are generally known to improve individuals' coping with adversity (Carver et al., 1989). Therefore, the current study will examine differences between male and female college students at an urban university in terms of such coping strategies and mental health outcomes (i.e., anxiety and depression symptoms) during the height of the Covid-19 pandemic (Fall 2020 and Spring 2021). Further, it examines whether coping strategies help protect students in terms of mental health and pandemic impacts on psychological functioning. Implications for improving college mental health support services will be discussed, and suggestions will be made for gender-informed interventions that effectively address the impacts of the COVID-19 pandemic among demographically diverse students.

Arhelia Figueroa, Undergraduate Student

Recognizing Our Power: Experiences of Latinx Immigrant Predominantly Spanish-speaking Parents During COVID-19

Faculty Mentor: Joanna Perez, Sociology

Latinx predominantly Spanish-speaking immigrant parents have disproportionately been impacted by the transition to virtual learning during COVID-19 due to lack of resources and services. Latinx predominantly Spanish-speaking immigrant parents are facing detrimental disadvantages due to the longstanding digital divide and the use of deficiency models to assess the academic capacity, progress, and success of their children. At the same time, research has shown that they are more likely to be dealing with a series of hardships related to overcrowded housing, lack of insurance, harsh working conditions, loss of income and food security, limited access to economic relief (especially if they are undocumented) and grieving the loss of their loved ones. Implementing qualitative methods, this research seeks to understand the experiences of Latinx predominantly Spanish-speaking immigrant parents during COVID-19 through Pláticas, which are “informal conversations that allow people to share ideas, knowledge, memories, or consejos (advice)” (Delgado Bernal, 2020, 159). The purpose is to analyze the ways that research participants use their agency to change the culture of how Latinx predominantly Spanish-speaking immigrant parents are acknowledged and involved in the process of their student's learning. By highlighting the experiences of these parents, this research aims to provide academic, policy, and cultural implications.

Leslie Gomez, Undergraduate Student

Lidar Study of Agricultural Landscape Usage & Food Security in the Northern Maya Lowlands

Faculty Mentor: Ken Seligson, Anthropology

The terrain of the Puuc Region in the Yucatán is well-documented as a complex compilation of low hills and vast jungles. The archaeological record indicates consistent habitation of the region from 800 BCE onward, with a population peak between 650-950 CE despite the challenging ecology of the “hill country.” However, surface excavations in the region have only provided so much evidence regarding how Northern Maya communities managed to maintain such a large occupancy. The production of digital elevation maps using lidar technology has allowed a closer look into understanding how large Maya population sizes were supported in a complex region, specifically by observing flat terrain anomalies presented in the data. The noting of these specific types of terrain strongly indicates a worked landscape, where potential plots were used for agriculture. By evaluating the size and distance of these agricultural plots using the ArcGIS geospatial analyses, this study provides insights into the daily diet, social economics, and relative food security the various Maya sites developed to support their population size and future expansions.

Alicia Melich, Undergraduate Student

Primate Influence on the Evolution of the Human Language

Faculty Mentor: Sarah Lacy, Anthropology

The evolution of human language is one of the biggest mysteries in the world. Amidst mathematical theories and other theories that have been disproven, a more evolutionary theory has been demonstrated to be more possible and favorable. Several non-related detailed studies have shown primate influence on the evolution of the human language. Previous studies focused solely on the beginning of language in hominids and ignored our closest living relatives. Two recent studies have exemplified the possibility of primate influence on the beginnings of human language. In one study on orangutans, it was found that their vocal calls could travel long distances without losing their meaning, which could be proposed that human ancestors strung together calls to convey messages similar to orangutans. (Pereira et al, 2020) In another study, the results showed that both humans and chimpanzees have a similar mouth to lip open and close-ratio and it can be hypothesized that spoken language was created with gestures such as lip-smacking that was available to ancestral primates and hominids. (Lameira, 2020) Both studies utilized naturalistic observations to gather data that could be quantified and analyzed. These new findings along with other primate communication research hold great significance in the origins of human language and can demonstrate supportive data to conclude human language evolved from our primate relatives.

Cesar Ovando, Undergraduate Student

Desde Tenochtitlan a Los Altiplanos: The Nahua and their Sixteenth-Century Conquest Mission in Guatemala

Faculty Mentor: Ken Seligson, Anthropology

Unfortunately, the history of the sixteenth-century Spanish conquest campaigns in the Americas continues to push Eurocentric epistemologies as many Iberian primary source accounts are available in print. The situation has allowed the Spanish conquistadors to entitle themselves to an elite and superior culture with little to no opposition. This narrative ultimately marginalizes the acknowledgment of indigenous participants and contributions to the campaigns. Despite these circumstances, scholars have pushed against the traditional triumphalist record by turning to a series of archival material, specifically indigenous language texts, which allowed them to uncover and amplify the Americas' indigenous perspectives and agency. This trend was known as the New Conquest History. Generally, the geographic scope of this study focuses on Mexico and, in some cases, Peru. However, the historiography of the New Conquest History has expanded into other American regions, including Guatemala. In this paper, I analyzed the contributions of the indigenous allies, specifically the Nahua from Central Mexico, in the conquest of the Guatemalan highlands. I argued that their intentions in aiding the Spanish during this invasion were all in the purpose of seeking and distinguishing themselves as conquistadors, so they were eligible for special privileges in their new colonial reality.

Alexander Camarillo, Undergraduate Student

Supporting First-Year Student Success through a Combination of High Impact Educational Practices

Faculty Mentor: Phillip A. Vieira, Psychology

A disparity exists for first-generation minority students pursuing degrees and careers in the Science, Technology, Engineering, and Math (STEM) when compared to their white counterparts. Currently, there is a barrier between accomplishing goals in STEM due to the lack of availability of resources and opportunities such as: access to mentorship, quiet areas to study, financial support for exams and applications, amongst others. Additionally, many students feel disengaged with their coursework, particularly those from minority households who are the first in their family to pursue higher education. By students not being supported with proper resources and opportunities we observe a decrease retention rate of minority freshmen in STEM majors. With a decrease of minorities staying in STEM during their academic career, this directly impacts the STEM workforce. A study by Excelencia in Education showed between 2012 and 2022 there will be a 11% projected growth in the STEM occupations, concurrent with the projected growth of the Hispanic population in the United States. Consequently, Hispanics students obtaining certificates and degrees in STEM will be vital for the STEM workforce. To address the need, a pedagogical study using transformative exploratory sequential mixed methods was utilized. This included designing a first-year seminar for the career development of entering undergraduate students at California State University Dominguez Hills, a Hispanic-serving institution. The impact of this study could include potentially providing a framework for which STEM departments can create a survey course to recruit incoming first-year students and encourage retention in STEM majors and careers. Lastly, this develops a pipeline for students to enter and graduate as a STEM major at this university and across the CSU-system to retain interest in STEM and join the STEM workforce.

Natural Sciences

Paul Dinh, Graduate Student

Accelerating Coral Growth Rates

Faculty Mentor: Charlene McCord, Biology

While accounting for less than 1% of the ocean's surface area, our coral reefs provide sanctuary to approximately 25% of all marine life. This biodiverse ecosystem also provides food, income, medicine, and coastal protection to billions of people worldwide. Unfortunately, due to global warming and human activity, our coral reefs are dying at an unprecedented rate.

The majority of coral research has focused on fast growing branching coral and overlooks the more resilient slow growing massive coral species. With water chemistry changing globally, it is imperative that we focus on coral that are more likely to survive these disturbances. Unfortunately, massive coral grows slowly but two methods, microfragmentation and thermal stress, have shown promise in increasing their growth rates. Microfragmentation is the process of creating small pieces of coral from a large colony and can increase growth rates by over 300% when compared to larger colonies. Additionally, 3 studies have shown that temporary exposure to elevated temperatures can be beneficial to coral growth rates.

In my research, I hope to demonstrate that both methods can be easily utilized to grow coral faster and potentially show a positive compounding interaction effect between microfragmentation and thermal stress. If the evidence does show a compounding effect, we can reduce the time, money and resources needed to out plant coral and restore biodiversity to our coral reefs.

Alicia Salmeron, Graduate Student

The Effects Native Plants and Fertilizers have on Nutrient Levels and Soil Infiltration Rates within two Different Sites on the CSUDH Campus.

Faculty Mentor: Charlene McCord, Biology

California State University Dominguez Hills has continually grown since the 1960s. As the campus has grown, there has been an increase in grey infrastructure, impermeable surfaces, and built environments on campus. These changes have led to more air pollution, storm water runoff, erosion, energy, higher temperatures, and an environment with less space for plant life to grow. When these conditions are combined with Southern California's droughts, it creates grave environmental and ecological concerns for our campus. My research is focused on mitigating the negative impacts of grey infrastructure, impermeable surfaces, and built environments on the CSUDH campus. My project aims to evaluate the impact of planting the highly adaptable cultivar *Verbena lilacina* and supplementing soils with organic and synthetic fertilizers on soil nutrient levels and water infiltration rate at three locations on the CSUDH campus: Green waste facility, vernal pool and the biology greenhouse. Preliminary results indicate that the introduction of *Verbena lilacina* and fertilizer contributed to an increase in infiltration rate at the green waste site over the course of twelve months. In contrast, infiltration rates at the vernal pool did not increase over the course of my project. This result is likely due to high concentration of clay in the soil at the vernal pool. I anticipate that the addition of both synthetic and organic fertilizers will initially increase soil content of phosphorus and nitrogen at all three study sites relative to the control. At the three-month post-planting mark, however, I foresee soil phosphorus and nitrogen concentrations to level off to the initial, pre-treatment levels because the plants will deplete all the nutrients that are readily available.

Armando Garcia, Graduate Student

Spatial Analysis of the Waste Management Program at CSUDH

Faculty Mentor: Parveen Chhetri, Earth Science

The generation of waste is a well-known problem throughout the planet. Waste has an impact on the environment, economy, and livelihood of people. It's gotten to the point where laws and mandates have been passed to help stop or limit the amount of waste that is generated. The idea of zero waste is widely becoming popular and the main point of emphasis for the solution to this problem. On a local level, California State University, Dominguez Hills (CSUDH) is taking initiative to become a zero waste campus. The Office of Sustainability on campus has set a goal of 90 percent diversion rate by 2025, with yearly goals along the way as well. In order to achieve this goal, a waste management program has been implemented throughout the campus which consists of the installation of zero waste stations with appropriate signage. The goal of this program is to provide students, faculty, and staff the opportunity and necessary tools to dispose of their waste and help the campus reach its zero waste goal. But three questions arise: are there enough zero waste stations on campus? are these zero waste stations in the best possible location? and are these zero waste stations actually working? To address these questions, the first objective of this study was to find if the campus needs more zero waste stations by using the spatial pattern of stations and population flow maps. The second aim was to find if the zero waste stations are being placed in locations that will maximize their potential by using spatial analysis. For the third objective, waste audits of all the major buildings on campus was conducted and the results was compared with data collected from 2018 and 2019 to see if the new waste management program is working. A statistical analysis was also conducted to compare the diversion rates from the zero waste stations from different buildings to see if certain buildings produce more waste than others. Initial findings have found that exterior bins are lacking in high traffic pathways and a lack of exterior bins in areas like Locker Student Union (LSU) and La Courte Hall (LH). These findings also found an abundance of exterior bins around buildings like at Natural Science & Mathematics (NSM) and Welch Hall (WH) that seem to be close to each other. This research aims to answer the previously stated questions in greater detail with the campus at 80 percent capacity next semester.

Elizabeth Hernandez, Graduate Student

Using GIS to Assess Vegetation Structure, Composition, and Recovery in the Angeles National Forest

Faculty Mentor: Parveen Chhetri, Earth Science

Wildfires play an important role in ecological functioning and biodiversity. Recently, wildfires have threatened forest ecosystems devastating the topography of the land and disrupting the soil profile. As urbanization and anthropogenic forces have increased, forest ecosystems will be further degraded. Thus, forest management is important to preserve biodiversity are classified as wildland-urban interface (WUI). WUI is the transition between unoccupied land and human development. Thus, forest management in WUI areas is important to preserve biodiversity. The recent study has evaluated the elevation, post-fire soil erosion, hydrology, and soil burn severity to assess post-wildfire vegetation recovery spatially. Spectral indices such as Normalized Difference Vegetation Index (NDVI) and Normalized Difference Burned Ratio (nDBR) were utilized to examine post-wildfire vegetation regrowth. NDVI uses electromagnetic wavelengths to detect healthy vegetation. Moreover, nDBR uses electromagnetic wavelengths to assess direct regrowth based on fire intensity. The purpose of this study was to use Geographic Information Systems (GIS) to assess vegetation structure, composition, and recovery in the Angeles National Forest. Overall, the spectral indices depicted significant differences in post-wildfire recovery in WUI and non-WUI areas. NDVI and nDBR suggested that vegetation recovery rates were lower in WUI areas than non-WUI areas. Post-fire soil erosion and soil burn severity were significant factors in post-wildfire vegetation recovery. Higher post-fire soil erosion led to water repellent soil. WUI areas consisted of high soil erosion and had an indirect effect on slower vegetation recovery. WUI areas that consisted of moderate soil burn severity can take longer for tree species to reestablish. Identifying and understanding factors of wildfires are an essential tool to creating hybridized approaches to better manage and preserve biodiversity.

Cindy Munoz, Undergraduate Student

High- and Low-Level Exposure to Particle Pollution in Unrepresented Cities

Faculty Mentor: Tianjun Lu, Earth Science

Low-income communities in Southern California are subjected to increased levels of air pollution due to multiple influences. In order to reduce emissions which disproportionately impact low income and minority communities, the spatial and temporal patterns of air pollution exposure in these communities must be identified. My research involves community engagement and the use of low-cost sensors (< \$300 USD) to collect samples in SoCal's 11 affected neighborhoods near CSU Dominguez Hills. This study conducted a cost-effective research analysis by rotating 7-10 Purple Air sensors for 22 households in June through November of 2021. We focused on assessing the temporal patterns (e.g., daytime vs. nighttime, weekdays vs weekends) and spatial patterns of the sampled measurements utilizing data from two weeks of continuous outdoor PM_{2.5} collection. We calculated the hourly averages of PM_{2.5} /atm and analyzed the high and low concentrations using statistical analysis. Concentrations averages 10-20 PM_{2.5} /atm during the majority of the study period. However, there were 2 notable data collection periods where PM_{2.5} /atm fluctuations were over 3 standard deviations from the mean. Our results indicate a high correlation between increased PM_{2.5} /atm concentration increases during periods of high road traffic and during industrial emissions events. These results indicate that households are impacted by emissions events; this is significant because zoning laws and environmental injustices have permitted the employment of industries near low-income communities.

Lari Smith, Jason Guerrero, Kirolos Saleeb, Sabrina Barata, Undergraduate Student

Discovery of Novel Natural Products with Cytotoxicity Towards a Pancreatic Cancer Cell Line

Faculty Mentor: Erin McCauley, Chemistry

Natural products are secondary metabolites produced by living organisms. They have played an important role in traditional medicine for thousands of years and continue to be an essential part of the current healthcare system, as over 65% of all approved therapeutic drugs are either natural products, natural product derivatives, or their pharmacophores are inspired from natural products. The success of these compounds and their derivatives as therapeutic agents is largely due to their high structural diversity and specific biological targets. Pancreatic cancer is a solid tumor cancer and over the last 50 years there has been no significant progress made to increase the 5-year survival rates of patients diagnosed with pancreatic cancer. The overall goal of this research is to identify novel chemical scaffolds from a large library of marine derived fungi that exhibit cytotoxic activity towards a pancreatic (PANC-1) cancer cell line. This was achieved by building a fungal library. The fungal library was grown by culturing 50 unique fungal strains in five different types of media and extracting the biosynthesized natural products. The metabolites were extracted and used to generate Distinct Testing Units (DTU). The DTU plates were screened in a biological assay to identify the extracts that contain compounds that exhibit cytotoxicity towards a pancreatic cell line. For extracts that exhibited cytotoxicity towards the PANC-1 cell line, the individual metabolites present in that extract were purified using high performance liquid chromatography and their structures were determined using mass spectrometry and NMR spectroscopy.

Jorge Hernandez Garcia, Undergraduate Student

Identification of Putatively Novel Natural Products from a Marine Derived Geotrichum silvicola Fungal Strain

Faculty Mentor: Erin McCauley, Chemistry

The overall objective of this research was to identify natural products with novel chemical scaffolds. One of the major bottlenecks in natural product research is the isolation and identification of previously known natural products. In order to avoid known natural product bottlenecks the Global Natural Products Social Molecular Networking (GNPS) platform was used. A library of over 50 fungal strains were grown in five different media types and the natural products they produced were extracted and analyzed using a liquid chromatography (LC)-tandem mass spectrometry (MS-MS). The MS-MS data was run through the GNPS platform, a program that allows for visual spectral networking of the natural products based on their chemical scaffolds. These scaffolds were then compared to a database of known natural products in the GNPS framework. By comparing the natural products present in the extracts to the known natural products in the GNPS database, dereplication of previously reported natural products were quickly identified. This allowed for prioritization of extracts that contained putatively novel chemical scaffolds, one of which was from a *Geotrichum silvicola* strain of fungi. The natural products produced by the *Geotrichum* strain were purified using high performance LC and their structures were determined using MS and NMR spectroscopy.

Edwin Chavez-Santana, Jorge Hernandez Garcia, Jeffrey Ocampo, Sabrina Barata, Undergraduate Student

Identifying Novel Chemical Scaffolds from Marine Derived Fungi using Mass Spectrometry based Molecular Networking.

Faculty Mentor: Erin McCauley, Chemistry

Natural products are secondary metabolites produced by living organisms. They have played an important role in traditional medicine for thousands of years and continue to be an essential part of the current healthcare system, as over 65% of all approved therapeutic drugs are either natural products, natural product derivatives, or their pharmacophores are natural product inspired. The success of these compounds and their derivatives as therapeutic agents is largely due to their high structural diversity and specific biological targets. The overall objective of this research was to identify novel natural products from an under explored source, marine derived fungi. This was achieved by culturing 50 unique fungal strains in five different media types and extracting the biosynthesized natural products. The extracts were analyzed using liquid chromatography-mass spectrometry (MS) using a tandem (MS-MS) format. The MS-MS data was analyzed using Global Natural Products Social Molecular Networking, a program that allows for visual spectral networking of the bacterial natural products present in the extracts. This enables the identification of clusters of compounds that had unique chemical scaffolds. The compounds were purified using high performance liquid chromatography and their structures were determined using 1D and 2D NMR spectroscopy.

Nathan Williams, Amber Alvarado, Arrianna Lister, Undergraduate Student

Characterization of HIV-1 P17 Interaction with Heparan Sulfate

Faculty Mentor: Kari Pederson, Chemistry

Heparan Sulfate (HS), a type of glycosaminoglycan (GAG), involved with the regulatory processes of the extra cellular matrix (ECM). HS is found throughout the ECM surface, has many sequences, and interacts with human immunodeficiency virus type 1 (HIV-1). Of the many proteins produced by HIV-1, only three interact with HS and of the three only two (Tat and gp120) have been extensively studied. This project focuses on the interaction between the third protein P-17 and HS. In specific P17 or Endo-S was expressed with a GST fusion tag, purified using affinity chromatography, and cleaved the tag protein. The binding interaction will be studied using NMR and that data will be used to generate possible structures.

Jessica Ledesma, David Saldana, Andrea Garcia, Raju Bista, Undergraduate Student
Tree-ring Growth Pattern Along the Elevation Gradient in San Jacinto Mountain, CA
Faculty Mentor: Parveen Chhetri, Earth Science

Global climate change is impacting the forest structure and dynamics around the world. Patterns observed include high tree mortality and changing radial growth patterns in dry southwestern United States. Jeffery Pine (*Pinus jeffreyi*) is one of the dominant tree species of the southwestern US forest ecosystem. However, research on its radial growth pattern in response to climate change is lacking. Therefore, this study aims to investigate the radial growth of Jeffery Pine in San Bernardino National Forest, California. This study was carried out in San Jacinto Mountain along the elevation gradient. We collected tree-ring cores from three elevation belts – lower (500 – 1000 m), middle (1500 – 2000 m), and upper (2500 – 3000 m). Tree-ring cores were processed in the Biogeography research lab of CSUDH, and we applied standard dendrochronological methods for data analysis. Results help us understand the factors controlling the tree-ring growth pattern along the elevation gradient and how the growth pattern changes in response to climate change. Findings from this study will help forest managers and United States Forest Service manage the changing southwestern forest ecosystem.

Jason Guerrero, Lari Smith, Kirolos Saleeb, Erin McCauley, Undergraduate Student
Identifying Natural Products with Selective Cytotoxicity Towards Breast Cancer Cell Line.
Faculty Mentor: Erin McCauley, Chemistry

Natural products are secondary metabolites produced by living organisms. They have played an important role in traditional medicine for millennia and continue to be an essential part of the current healthcare system, as over 65% of all approved therapeutic drugs are natural products or natural product derivatives. This research will screen a large library of natural products for metabolites that kill breast cancer cells. Additionally, it will use innovative tandem mass spectrometry techniques to rapidly identify natural products with novel chemical structures. The overall goal will be to identify novel natural products that can be used in breast cancer research as drug leads. There will be an estimated 281,550 new cases of breast cancer in the US in 2021 and an estimated 43,600 deaths. Although breast cancer research has come a long way over the last few decades, new compounds with novel chemical structures are continually needed to serve as drug leads for future therapeutic development. This research will add to that growing body of compounds by identifying natural products with novel chemical structures that exhibit cytotoxic activity towards a human breast cancer cell line.

Raymond Nunez, Undergraduate Student
Visualizing the Spatial Pattern of Sprinklers System for Better Irrigation Practices at CSUDH
Faculty Mentor: Parveen Chhetri, Earth Science

The baseball and softball players at CSUDH have issues with the uneven distribution of grass in both fields and overly wet and dry patches that make it difficult to perform during games. The purpose of mapping the sprinkler system of the baseball and softball fields at CSUDH is to visualize a spatial pattern where the grass is over and under irrigated. The goals are to identify better irrigation and distribution of resources, which will cause safer conditions for players, less waste of resources, and potentially save the school thousands of dollars. This research helped visualize the areas in question using Geographic Information Systems (GIS), allowing us to analyze any irrigation patterns. The sprinklers were recorded individually using a GPS tool and the help of the irrigation specialist in CSUDH to identify each brand, model, and nozzle. The tentative area in question between the softball and baseball fields covers an approximate size of 162,796 square feet. We accounted for a total of 115 sprinklers with two main brands, seven different models, and 24 different nozzles. The irrigation range between all of the sprinklers is 25 to 65 feet radius. Based on the spatial analyst tool in the GIS platform, we identified over and under irrigated areas. The findings of this research could be recreated in various other fields, potentially saving water and money.

Dulce Garcia, David Saldana, Jessica Ledesma, Undergraduate Student

Basal Area Growth of Jeffery Pine Along the Elevation Gradient in San Bernardino National Forest, CA

Faculty Mentor: Parveen Chhetri, Earth Science

Jeffery Pine (*Pinus jeffreyi*) is one of the dominant tree species of the southwestern US forest ecosystem. However, research on its basal area growth pattern in response to climate change is lacking. Recent studies have indicated that Basal Area Increment (BAI) minimizes the age-related growth trend and better reflects the radial growth trend of trees and is biologically more meaningful. Therefore, this study aims to investigate the basal area growth of Jeffery Pine in San Bernardino National Forest, California. We collected tree-ring cores from three elevation belts – lower (500 – 1000 m), middle (1500 – 2000 m), and upper (2500 – 3000 m). Tree-ring cores were processed in the Biogeography research lab of CSUDH, and standard dendrochronological methods were applied for data analysis. Outcomes of the study help us understand the factors controlling the tree growth pattern along the elevation gradient and how the growth pattern is changing in response to climate change. Findings from this study will help forest managers and United States Forest Service manage the changing southwestern forest ecosystem.

Cindy Munoz, Undergraduate Student

Air Quality Monitoring in Low-Income Communities

Faculty Mentor: Tianjun Lu, Earth Science

This project aims to provide a baseline air quality database and a pilot work using citizen science and low-cost sensing technologies. The project team will develop an air pollution monitoring network in 11 disadvantaged communities (e.g., Compton, Wilmington) around CSUDH, supplementing existing regulatory monitoring effort by federal and state agencies. Importantly, the air pollution samples (particulate matter) collected at 22 locations (with at least 2-week of monitoring) during different times (e.g., daytime vs. nighttime, weekdays vs. weekends, COVID-19 period, and wildfire seasons) will help advance the engagement with the local communities.

Kirolos Saleeb, Undergraduate Student

Identification of Fungal Natural Products that Exhibit Cytotoxic Activity Towards a Brain Cancer Cell Line.

Faculty Mentor: Erin McCauley, Chemistry

The National Institute of Health Surveillance, Epidemiology, and End Results (SEER) Program estimates there will be a total of 24,530 new cases of brain cancer diagnosed in 2021 and an estimated 18,600 deaths. The overall goal of this research is to identify fungal natural products that exhibit cytotoxicity towards a brain cancer cell line. Natural products are secondary metabolites produced by living organisms and they make excellent therapeutic drug leads as over 65% of all approved therapeutic drugs are either natural products, natural product derivatives, or their pharmacophores are inspired from natural products. To initiate this research over 50 fungal strains were cultured and the metabolites they produced were extracted. The natural products were screened against a brain cancer (U87) cell line using the sulforhodamine B (SRB) assay cytotoxicity assay. If an extract exhibited activity in the SRB assay, the metabolites present in the extract were purified using high performance liquid chromatography and their structures were determined using mass spectrometry, NMR, and circular dichroism spectroscopy.

Jeffrey Ocampo, Undergraduate Student

Identification of Putatively Novel Natural Products from a Marine Derived Fusicolla sp. of Fungi

Faculty Mentor: Erin McCauley, Chemistry

Natural products are secondary metabolites produced by living organisms. They play an important role in the current medical system accounting for over 65% of all FDA approved pharmaceuticals. The overall goal of this research is to identify fungal natural products with novel chemical scaffolds that can be screened in various biological assays. To initiate this research, over 50 taxonomically unique fungal strains were grown in different media types and the metabolites they produced were extracted. The extracts were analyzed in a liquid chromatography (LC)-tandem mass spectrometry (MS/MS) format so they could be run on the Global Natural Products Social Molecular Networking (GNPS) platform. The GNPS platform contains a massive database of MS/MS spectra from known natural products. The MS/MS spectra of the fungal extracts was compared to spectra in the database using the Spectral Similarity function of the platform. Extracts with metabolites that showed minimal or no similarity to known compounds in the database were prioritized for further study. One of these was an extract from an *Fusicolla* sp. of fungi. These putatively novel compounds were purified using high-performance liquid chromatography and their structures were determined using MS in addition to 1D and 2D NMR spectroscopy.

Health, Nutrition, and Clinical Sciences

Kelly Cox-Gonzalez, Cale Foreman, Adam Watson, Graduate Student

The Uncanny Valley Phenomenon in Relation to Upper Extremity Prosthetics as Viewed by Amputee & Non-Amputee Populations

Faculty Mentor: Jennifer Lucarevic, Health Science

The Uncanny Valley Effect (UVE) is the phenomenon that as an object, such as a robot or prosthetic device, begins to look more human-like, the more likely it is to elicit a cold, eerie feeling (Mori, 2012). For upper extremity amputees, the replacement of a hand is crucial to ideas of self-image and performing functional tasks. The purpose of this study is to investigate if the UVE will affect how both amputee and non-amputee populations view upper extremity prosthetics. An online survey was distributed to amputee and non-amputee participants, asking each to rate a set of images based on how unsettled each image made them feel. The images included four categories with three images each. A Kruskal-Wallis analysis via SPSS was used to compare average Likert scores amongst four subject groups. Significant differences between group responses were found in Prosthetic Hooks (KWA 18.94, $p < .001$); those not exposed to prosthetics scored significantly higher than those in O&P ($p < .001$), and amputees ($p = .045$). There was a significant difference in responses to Anatomic Control (8.57, $p = .036$). Those exposed to prosthetics had significantly higher unsettling feelings than amputees ($p = .017$), O&P professionals ($p = .042$), and those not exposed ($p < .01$). The most significant difference found was how the 4 groups viewed hook terminal devices ($p < 0.001$), there was also a statistically significant difference on how anatomical hands were viewed ($p = 0.036$). Due to the lack of statistical significance for most meaningful comparisons, no definitive conclusion can be made. More study is necessary into whether or not the UVE holds true for upper extremity prostheses and whether or not the effect differs amongst different populations.

Jose Garcia, Taylor Warren, Martha Bretado, Graduate Student

Illinois Agility Test Scores for Wheelchair Basketball

Faculty Mentor: Jennifer Lucarevic, Health Science

There is currently a lack of research on Paralympic sports, including wheelchair basketball. With the Paralympic movement progressing, wheelchair basketball is becoming more popular at all levels gaining more participation. With more research, a further understanding can be reached in how scores on agility tests can relate to players' performance on the court. The hypothesis is that wheelchair basketball players with more than five years of experience will complete the modified Illinois Agility Test (IAT) faster than the players with less than five years of experience. A retrospective study design was used for this study. The collected data is from two wheelchair basketball skills clinics at Harvard Westlake Secondary School and Golden Hill Recreation Center. The participants completed the modified IAT three times, and the average of the times from each trial was taken to compare both classification groups. The data was utilized from players who played at least one year to twenty-five years. Five of the participants ($n=10$) had the fastest recorded time (31 s) for newer athletes. The fastest time for the subjects with more than five years of experience (26 s) was recorded for three out of ($n=29$). The most frequent time (31s) consisted of nine subjects ($n=29$). There was a statistically significant negative correlation between years of experience and the fastest time on IAT ($r_s = -.44$, $p < .01$). The results of this study supported our hypothesis that athletes with more wheelchair basketball experience would have faster times. This research did not account for several variables that can impact wheelchair agility including functional level classification (athlete trunk strength and balance), wheelchair fit, health conditions, and energy levels. For future studies, different variables such as sex and age can play a vital role in determining athletes' potential performance in obtaining their fastest time.

Amani Weekes-Daniel, Nicole Halfman, Quinn Mehigan, Graduate Student
Athletic Foot Posture and Performance in Men's Varsity and Junior Varsity Lacrosse
Faculty Mentor: Jennifer Lucarevic, Health Science

The purpose of this research project was to determine how forward and lateral agility performance compares in participants with normal¹ foot posture versus those with abnormal² foot posture. We utilized a pre-existing de-identified data set from pre-season functional testing to compare the data of the Illinois agility test (IAT) to the Edgren Side Step Test (ESST). A Mann-Whitney U test, Chi-squared test, and Spearman's correlation test were used for statistical analysis. The pre-existing data set includes student-athletes under the age of 18 who play lacrosse on the men's varsity and junior varsity team at an unidentified high school. All participants were given a detailed description of the tests performed and given consent forms signed by their parents/legal guardians. The risk of conducting this research is the release of identification criteria of the participants. The name of the high school will be excluded from documentation to avoid violation or identification of the participants. The benefit of this research project is a future analysis that will provide an increased understanding of how to enhance the athlete's performance and decrease their chance of injury. Chi-squared testing showed us that there was no significance between foot posture and the athlete's grade, dominant arm, position, and lower limb injuries. However, there was a correlation between IAT and age ($p = -0.803$) and IAT and ESST ($p = -0.645$) after conducting the Spearman's test. Though the data showed no significance in determining if forward and lateral agility performance compares in participants with normal¹ foot posture versus those with abnormal² foot posture, this information can be helpful for future research studies done on how to enhance an athlete's performance based on their foot posture.

Paul Mindeman, Mario Jimenez, Nick Mastrandrea, Jacob Schulman, Graduate Student
The Relationship Between Residual Limb Length and Gait Kinematics in People with Unilateral Transradial Amputation
Faculty Mentor: Julie Werner, Occupational Therapy

People who have undergone an upper extremity amputation often develop problems secondary to the amputation itself. Often, due to a shift in the body's center of mass, an individual can have issues with balance and coordination due to their limb asymmetry. Compared to an able-bodied person, an upper extremity amputee is at a higher risk for falling and often has to adopt compensatory movements to make up for the weight shift. We hypothesize that there will be a statistically significant difference between the amputation side and sound side gait kinematics and spatiotemporal values. To assess this, tools such as the Zeno Mat walkway and Vayu-Tech sensors were used to determine if there was a correlation between residual limb length and abnormal gait. A population of upper extremity amputees was studied for any gait asymmetries during level-ground walking. However, we were only able to find statistical significance between the degree of lateral trunk flexion between the ipsilateral and contralateral sides, with the individual tending to lean towards their affected side.

Michael Wood, Kimberly Campos, Roxanna Macias, Cindy Munoz, Hussam Alghamdi, Graduate Student
Air Pollution Distribution Among Vulnerable Populations in the South Los Angeles Region
Faculty Mentor: Parveen Chhetri, Earth Science

Air pollution exposure is known to cause illnesses (e.g. asthma, cardiovascular disease, and cancer.) Populations living near major freeways are at highest risk due to proximity to large amounts of traffic-related air pollution. Studies suggest that marginalized populations (e.g. people living in poverty) are disproportionately affected by the effects of air pollution due to social and economic disparities. This study analyzes the distribution of air pollution within the South Los Angeles region. More specifically, this study conducts a spatial analysis of particulate matter pollution, environmental justice scores, and demographic indicators within three distances from major freeways. This study finds that air pollution is significantly highest within 1 mile from major freeways, where a larger population of marginalized people reside. The results of this study may inform city planning to enforce a mandated restriction on limiting uses near major freeways for marginalized populations.

Natalie Wong, Kimberly Iniguez, William Harris, Graduate Student

Comparison of Functional Performance of People with Transfemoral Amputation Using a Microprocessor Knee Versus Mechanical Knee

Faculty Mentor: Jennifer Lucarevic, Health Science

Transfemoral amputees rely heavily on their prostheses; specifically, the prosthetic knee unit as it contributes greatly to the reliability and usefulness for the user. For transfemoral amputees, the risk of falling is increased and can be a significant and ever-present fear for the individual. We hypothesize a microprocessor knee (MPK) with hydraulic resistance will provide a greater weight load symmetry, therefore increasing stability and subsequently a reduced fall risk for the user than a nonmicroprocessor knee (NMPK) without hydraulic resistance. Retrospective data on two performance-based outcome measures, the Stand to Sit and Figure of 8, were utilized to test our hypothesis by comparing MPKs and NMPKs on unilateral transfemoral amputees. The population for this study is 5 participants who are unilateral transfemoral amputees over the age of 18 and have at least one year of experience on either an MPK or NMPK. All participants were patient models from the California State University of Dominguez Hills Orthotics and Prosthetics graduate program. Data analysis showed a statistically significant difference in pressure symmetry during the Stand to Sit test, with the MPK allowing subjects to distribute their weight more evenly between their prosthetic foot and sound foot, but did not show a statistically significant difference in performance during the Figure of 8 test in either time or number of steps taken to complete the test. The data suggests MPKs provide more stability to the user than NMPKs. These results contribute to existing findings that continue to inform clinical decisions on what prosthetic knee unit is best for each patient.