24TH
ANNUAL

RONALD E. MCNAIR SCHOLARS

UNDERGRADUATE RESEARCH SYMPOSIUM

APRIL 20, 2023

PRESENTED BY: CAL POLY POMONA
MCNAIR SCHOLARS PROGRAM

DIRECTOR'S NOTE

Dr. ALEJANDRO MORALES

Welcome to the 2023 Annual Ronald E. McNair Postbaccalaureate Achievement Program Symposium! I am Alejandro Morales, the program's faculty director and professor of Psychology at Cal Poly Pomona. Each year our scholars work closely with their faculty mentors on projects related to their field of study. Our symposium offers our scholars the opportunity to showcase their work to fellow McNair scholars and the larger university community.

The McNair symposium is the culmination of the scholars' hard work and dedication. They are excited to talk about their results and what they accomplished in the past year. Some of them will move on to graduate (MA & Ph.D.) programs at universities across the country, such as the University of Colorado, University of Nebraska-Lincoln, University of Iowa, University of California, Davis, University of California, Santa Barbara, among others. A group of our scholars will participate in summer research programs at universities like University of Wisconsin-Madison, University of Colorado, and University of Massachusetts. The rest of our scholars will stay close to home and apply to graduate programs next year.

Lastly, we have a lot to be grateful including the renewal of our grant for five more years, our scholars are attending summer research programs in and out of state, and scholars continue, and every year scholars are accepted into competitive graduate programs across the United States. As the academic year ends, we say goodbye to cohort 24 and welcome cohort 25. The McNair Scholars program remains an exemplar at Cal Poly Pomona for supporting and mentoring first-generation, low-income, and underrepresented students in pursuing doctoral degrees and becoming college professors.

Congratulations cohort 24, we are so proud of you!

Alejandro Morales, Ph.D

Symposium Schedule

Breakout Room: BSC Perseus

Moderator: Dr. Brian Ramirez

Time	Scholar	Major	Research Title
2:40	Ana Jurado	Mechanical Engineering	Self-Sustained Unmanned Aerial Vehicles
5 min Break			
3:00	Stephanie Strain	Mechanical Engineering	The change over time of mechanical properties of PLG 15-85 within a simulated human body
5 min Break			
3:20	Noor Halabi	Chemical Engineering	Size Distribution Analysis of Hydrophobic drug nanoparticles with metal-Polyphenolic Network Coating
5 min Break			
3:40	Enner Mendoza	Chemical Engineering	Synthesis, characterization, and application of nickel salophen complexes toward catalytic cross-coupling
5 min Break			
4:00	Jennifer Hernandez	Civil Engineering	Comparison of Hard Engineering versus Bioengineering Against In-Stream Erosion
5 min Break			
4:20	Ruben T. Romero	Computer Engineering	Exploring Collaborative Robotic Environment at CPP Reconfigurable Space Computing Lab

Breakout Room: BSC Orion A

Moderator: Dr. Marie B. Lamothe Francois

Time	Scholar	Major	Research Title
2:40	Johanna Flores	Psychology	Latinx/a/o Parents' Knowledge and Perceptions of Social-Emotional Learning
5 min Break			
3:00	Ana Tercero	Psychology	Exploring the effects of the Mental Timeline on Memory
5 min Break			
3:20	Alexis Trejo	Psychology	Dual Language Immersion Benchmarking Study
5 min Break			
3:40	Carlos Mendieta	Psychology	Processing of Unlicensed Corrections via Event-Related Potentials
5 min Break			
4:00	Evelyn Ojeda	Psychology	DREAMers in higher education: Mental health challenges, supportive factors, and resiliency
5 min Break			
4:20	Davianna Moran	Psychology	Think About Sleep, Not Suicide: A Study on the Relationship Among Sleep, Depression, and Suicide
5 min Break			
4:40	Eliel Davis	Psychology	The Romantic Experiences of Black Women in Higher Education

Breakout Room: BSC Orion B

Moderator: Dr. Shayda Kafai

Time	Scholar	Major	Research Title
2:40	Jacquelyn Moran	Liberal Studies	Latina Women's Undergraduate Experiences and Mentorship in Preparation for Graduate School
		5 min Break	
3:00	Rio Becerril	Psychology	Influences on Biracial and Multiracial Adolescent's Racial/Ethnic Identity Development in Higher Education
		5 min Break	
3:20	David Areyzaga	Psychology	The Emotional Experiences of Latino Men That Motivate Academic Goal Pursuit
		5 min Break	
3:40	Jasmine Penate	Sociology	What Factors Influence a Shift Away From Indigenous Identities and Cultures to Mainstream Western Culture Among Indigenous Guatemalans
		5 min Break	
4:00	Oona Iglesias	Sociology	Effectiveness of the McNair Scholars Program at Cal Poly Pomona
		5 min Break	
4:20	Elizabeth Gerena	GEMS	Radical Trans Joy: Gender Euphoria from the TBIPOC Community
		5 min Break	
4:40	Addison Bates	GEMS	Feminist Parenting: A Collection of Parenting Approaches Shared by Feminists in the U.S.

Breakout Room: BSC Orion C

Moderator: Dr. Alex John

Time	Scholar	Major	Research Title
2:40	George Hernandez	Chemistry and Bio-Chem	Synthesis of Macrocyclic Bisbenzyltetrahydroisoquinolines by Pictet-Spengler Cyclodimerization
5 min Break			
3:00	Ivy Wang	Nutrition Science and Chemistry	Ligand effects in Molybdenum Catalyzed Oxidation of Benzylic Alcohols
5 min Break			
3:20	Gina Lalli	Biology	The Effects of Metformin on the Development of Human Mesenchymal Stem Cells
5 min Break			
3:40	Brian Powers	Philosophy and Political Science	Practical Public Bioethics
5 min Break			
4:00	Ava Ruiz	Philosophy	Gender, Race, and Ethnicity Disparities in Undergraduate Philosophy and Economics
5 min Break			
4:20	Juan Salcedo	Anthropology and Archeology	The Symbolism of Body Modification of the Maya Post-Mortem
		5 min Break	
4:40	ShuTing Chen	Food Science and Technology	Prevalence of Antibiotic Resistance Bacteria in Fresh Produce

SCHOLAR ABSTRACTS AND BIOGRAPHIES

David Areyzaga
Mentor: Dr. Soeun Park
Title: The Emotional Experiences of Latino Men That Motivate Academic Goal Pursuit

Abstract:
The focus of this study is to investigate the emotional experiences of Latino men that motivate academic goal pursuit. This research is to better understand the cultural and emotional factors that have been aiding Latino men in their academic pursuit in order to assist others in similar situations. There are 3 research questions: 1) How does Latino culture impact how Latino men deal with emotional experiences? 2) How do Latino men use these emotional experiences as motivation? 3) What are the most prevalent emotional experiences that motivate Latino men? Participants will be recruited through the university by using SONA, club discord, and snowballing. 10 participants will be recruited who self-identify as Latino men and university students. Semi-structured interviews will be conducted in person and on zoom. The interviews will be transcribed and analyzed by a research team. Participants will also be given the opportunity to approve the transcripts. Using interpretive phenomenological analysis (IPA), the transcripts will be analyzed to identify themes. IPA is used to analyze qualitative methods with an interest in psychological aspect of how people make sense of experience (Larkin & Thompson. 2012). These questions are geared towards understanding a specific group of people and their circumstances. Awareness to this study can bring Latino men the opportunities and resources to thrive and succeed in an educational environment. Clinical implications can use this research to further investigate emotional experiences within the Latino male community. This qualitative study uses interpretive phenomenological analysis to investigates the emotional experiences of Latino men that motivate academic goal pursuit. Participants who self-identify as Latino men and are currently university students were recruited and given semi-structured interviews. Results will bring awareness to this study that can bring Latino men the opportunities and resources to thrive and succeed in an educational environment.

Biography:
David Areyzaga is a fourth-year undergraduate at California State Polytechnic University, Pomona who is studying Psychology. In his previous years, he has worked with two different organizations to instruct and supervise adolescent children ranging from elementary to high school. He currently works with college students with disabilities as a mentor. He plans to receive his Ph.D in Clinical or Counseling Psychology where he can gain the tools to assist his community through professorship, research, and practice. His current short term plan is to gather more research experience and work with non profits to help promote awareness of mental health within his community. His long term plans are to advance into higher education. During the fall quarter of 2023, he will be applying to graduate programs.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Addison Bates
Mentor: Dr. Anita Jain
Title: Feminist Parenting : A Collection of Parenting Approaches Shared by Feminists in the U.S.

Abstract:
This study aims to explore the intersection between leftist ideology and parenting styles, with a focus on feminist parenting. Drawing from feminist theory and personal narratives, this research seeks to identify methods for resisting harmful societal norms and imparting healing to children. The literature review consists of four key texts: Living a Feminist Life by Sarah Ahmed, Heartberries by Terese Marie Mailhot, Feminisms in Motion edited by Jessica Hoffman and Daria Yudacufski, and Abolition Democracy by Dr. Angela Yvonne Davis. These texts provide a foundation for the study's approach, offering insights into how societal oppression is produced by the family, personal experiences of integrating leftist ideology into parenting, diverse perspectives on intersectional feminism, and a big-picture perspective on democracy and liberation. The study employs a qualitative research design, utilizing semi-structured interviews with participants who self-identify as feminist parents. The analysis will be guided by Ahmed's concept of "sweaty concepts," which emphasizes the importance of incorporating personal experiences and emotions in academic research. The study's findings will contribute to the emerging field of feminist parenting, offering practical methods for parents to integrate broad ideologies into their parenting style. Additionally, this research aims to expand on the intentions of Feminisms in Motion, providing a more comprehensive archive of perspectives on the topic of intersectional feminism with specific regard to parenting. Overall, this study hopes to provide a better understanding of how parenting styles are deeply connected to our society's political landscape and offer guidance to parents seeking to resist harmful societal norms and impart healing to their children.

Biography:
Addison Bates is a senior majoring in Gender, Ethnicity and Multicultural Studies with a minor in African-American Studies. Their passion for resisting oppression and participating in social movements towards empowerment and liberation has been demonstrated through their personal activism focused on intersectional abolition and liberation, as well as their career as a liberation-oriented youth worker. Addison integrates their societal beliefs into their personal, interpersonal, career and educational paths. As an aunty, they have developed a particular interest in exploring ways that feminists can bring social ideologies into their parenting to create and implement equity on the interpersonal level with children. Their research focuses on exploring first-hand accounts to draw inspiration for resisting normative parenting that operates from oppressive norms and offering more liberated ways of parenting. Addison plans to earn their Ph.D. in Human Development to study restorative ways to interact with children and work in a community-facing role focusing on social and emotional healing for intersectionally impacted youth.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Rio Becerril
Mentor: Tatiana Pumaccahua
Title: Influences on Biracial and Multiracial Adolescent's Racial/Ethnic Identity Development in Higher Education

Abstract:
Previous research has demonstrated that a relationship exists between racial/ethnic identity and self-esteem among biracial and multiracial adolescents, as well as a relationship between self-esteem and parenting style. However, there is very little research that examines the racial/ethnic identity development of biracial/multiracial adolescents, especially in terms of how their parent/caregiver's cultural background influences their parenting practices and the corresponding impact it has on the adolescent's self-esteem and self-concept. Therefore, the aim of this pilot study was address these topics by qualitatively examining the experiences of biracial/multiracial adolescents. More specifically, the factors that influence these adolescents' racial/ethnic identity and self-esteem; in particular, the parenting style and environmental context they experienced. The Intersectionality Framework was utilized to contextualize the
lived experiences of biracial/multiracial adolescents within a sociopolitical context. This framework is a useful lens in holistically understanding the unique lived experiences of adolescents who have intersecting privileged and oppressed social identities. Study findings and implications will be discussed in this presentation. More specifically, the study results will help increase what is known about environmental influences, parenting/caregiver style, as well as how biracial and multiracial adolescents make sense of their racial/ethnic identity development within a higher education context.

Biography:
After receiving her AA.T in Psychology, Rio transferred to California State Polytechnic University, Pomona where she is currently a fourth-year student, and research assistant in the Socioemotional Lab. Additionally, Rio is also a McNair scholar, and she is currently researching the influences on biracial/multiracial adolescent's racial identity development in higher education. Her previous research experience consisted of attending a summer research program in Colorado, where she was studying the efficacy of bright light therapy for treating depression in the Veteran population. Ultimately, she wishes to eventually attend graduate school to pursue a focus in Clinical Psychology. More specifically, Rio wants to work with children and adolescents from underrepresented communities that are struggling with depressive and anxiety disorders. Thus, Rio would like to further her education and research experience in Psychology so she can create a safe, and helpful environment for those who need it.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

ShuTing Chen
Mentor: Dr. Xu Yang
Title: Prevalence of Antibiotic Resistance Bacteria in Fresh Produce

Abstract:
Antibiotic-resistant bacteria are strains that have developed resistance against antibiotic drugs. The extended-spectrum beta-lactamases (ESBL) producing Enterobacterales and Carbapenem-resistant Enterobacterales were bacteria that have developed resistance against commonly used Beta-lactam antibiotics and were identified by the Center for Disease Control and Prevention (CDC) as serious and urgent threats, respectively. The aim of this study was to determine the prevalence of ESBL producing and carbapenem-resistant Enterobacterales in fresh produce available at local stores. Fresh produce, including carrots, spinach, sprouts, lettuce, and mixed salads, was purchased from various grocery stores. Then, samples of 25 grams of the produce were processed and grown on ESBL and CARBA CHROMagar. Disk analysis was then performed to further confirm the antibiotic resistance of the bacteria. Furthermore, a full antibiotic resistance spectrum analysis was performed with an additional 9 antibiotic disk each represent a caterogry of clinically important antibiotic. Out of the 232 samples collected, 9 were found to contain ESBL producing Enterobacterales and 15 were found to harbor carbapenem-resistant Enterobacterales. As for the full antibiotic resistance spectrum analysis, among the 22 isolates that were tested, they all showed resistance toward Ampicillin (AMP) and Amoxicillin and Clavulanic Acid(AMC), from the beta-lactam antibiotic category, respectively. Surprisingly, it was found that there were samples of Enterobacterales that were starting to develop resistance toward Polymyxin B, which was the last defense used to treat infection caused by carbapenem-resistant Enterobacterales. In conclusion, the presence of antibiotic-resistant bacteria in fresh produce was noticeable, and further research will be conducted to gain a better understanding of its prevalence and role.

Biography:
Shu Ting Chen is a third-year undergraduate student majoring in Food Science and Technology at California State Polytechnic University, Pomona. She actively seeks opportunities for personal development and to satisfy her curiosity. During her time at Cal Poly Pomona, she has participated in various programs and projects. Her interest in undergraduate research and microbiology led her to participate in her current project that focuses on food safety and public health. Shu Ting plans to pursue a Ph.D. in Food Science or Microbiology, so she can also contribute to safeguard our food system and public health through continues research and innovation. Her short-term goal is to continue her participation in research to accumulate knowledge and skills, which will be beneficial for her long-term goal of achieving higher education and making new discoveries. During Fall 2023, she will be applying to various graduate schools in and out of state.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Eliel Davis
Mentor: Dr. Erica Morales
Title: The Romantic Experiences of Black Women in Higher Education

Abstract:
The intersectional identities black women must negotiate on college campuses make their experiences unique. Literature focused on the romantic experience of college students as a whole fails to capture this experience. Although research on the romantic experience of black women in college is expanding, (Stackman et. al 2016; Stephens & Thomas 2012;), much of this literature focuses on the sexual health risks, or risks of violence (Alleyne & Gatson 2010; Smith et. al 2003). Racism and Sexism not only affects Black women's romantic experiences in college as a group, but also as individuals. This study aims to highlight those individual experiences from the perspective of black women. This study will utilize interviews to analyze the personal romantic experiences of 5 black women on campus in order to highlight this. The interview questions focus on the participants' own romantic experiences. They are open-ended in order to bring out unique perspectives that may not have been captured in the current literature. This study will use 5 semi-structured interviews with black women college students. This study addresses the following questions: How do Black women experience the effects of their race and gender while dating on college campuses? How do Black women perceive and navigate the sex ratio imbalance between black men? How do Black women experience eurocentric notions of beauty while dating on campus? How do Black women perceive and/or experience interracial dating?
How do Black women weigh the social costs of their romantic decisions?

Biography:
Eliel Davis is a Senior Psychology major at California State Polytechnic University. Eliel is currently a Resident Advisor, Black Men of Excellence intern, R.I.S.E. student leader, and a Psyches of Color Lab research assistant. Additionally, he is a member of the Kellogg Honors College and Ronald E. McNair Scholars program. Eliel's current research for McNair is focused on the Romantic Experiences of Black Women in College. He plans to receive a Ph.D. in Psychology in order to research and treat the mental health of historically disadvantaged communities. His short term plans include researching the intersection between culture, relationships, and mental health. During the fall quarter of 2023, he will be applying to graduate school programs.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Johanna Flores
Mentor: Dr. Rachel Baumsteiger
Title: Latinx/a/o Parents' Knowledge and Perceptions of Social-Emotional Learning

Abstract:
Social-emotional learning (SEL) is becoming an area of focus for K-12 schools. With the rise of SEL program implementation, we need to assess how parents can become a part of the SEL implementation and academic conversation. There needs to be a parent focus because parents/caregivers play a big role in their child's development and in helping cultivate skills learned in school. But there are scarce studies demonstrating how parent involvement can aid in cultivating SEL skills learned, and even fewer studies solely focusing on parents and their thoughts and knowledge on SEL. Furthermore, the U.S. census states that with the growth of the Latinx population, Latinx enrollment has also risen. So, we can infer that most K-12 enrollment in the U.S. comprises Latinx youth. Moreover, according to new U.S. Census population projections, there will be a Latinx population boom where most of the younger generation will be Latinx. So, given these gaps in the literature and that the Latinx population is large and growing, this study qualitatively explored Latinx/a/o's parents' knowledge and perceptions of SEL in hopes of making sure that interventions are effectively targeting this group. In addition, a key step for SEL is to help Latinx parents understand the purpose and process of the practices and to know how to reinforce these learning at home. Preliminary findings and implications of the study will be discussed in this presentation. In particular, findings will provide crucial information on how awareness/knowledge of SEL and SEL programs are critical to Latinx parents because they can help their child learn and cultivate SEL skills to help them navigate the barriers of living as an immigrant youth or person of color in the U.S.

Biography:
Johanna Flores is a fourth-year undergraduate psychology student with an emphasis on child development. She's currently pursuing a career in the School Psychology field, where she plans on using her skills to help underserved/underrepresented families/children. Since she wants to make a significant impact in helping underserved/underrepresented peoples, she became interested in research and seeing how she could use this tool to amplify and shed light on certain communities and topics. So she became a McNair scholar. Her research study for the prestigious McNair research program focuses on amplifying Latinx/a/o Parents' voices in Social-Emotional learning research. In addition, she is a part of two social science labs where she works on research projects that focus on social-emotional aspects, prosociality, well-being, and social justice, to name a few. Her goal is to be able to be in a position where she can make real change for the betterment of families and children, specifically in the school system.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Elizabeth Gerena
Mentor: Dr. Shayda Kafai
Title: Radical Trans Joy: Gender Euphoria from the TBIPOC Community

Abstract:
In a culture that privileges gender dysphoria, this research centers gender euphoria. To me, gender euphoria is wearing an all pink outfit after years of despising pink for making me look too feminine; it is the small hairs under the bottom of my chin from taking testosterone. It is my voice dropping. Although I did not experience gender dysphoria for many years, contrary to the normative trans narrative, it was gender euphoria that taught me to celebrate my transness. This project amplifies the joyousness of gender euphoria and most importantly, explores how we can dismantle the myth that gender dysphoria is a critical component of the normative trans narrative. Additionally, this study is intersectional and centers BIPOC folks. There are already very few papers on gender euphoria, and so focusing on TBIPOC folks is crucial. Using a testimonio method and a theoretical framework that centers queer theory and intersectional feminist theory, this study seeks to define the communal and personal narratives of TBIPOC in regards to gender euphoria; furthermore, this project is to see how TBIPOC folks transform the normative, medical model of gender dysphoria if they center and/or uplift gender euphoria.

Biograpghy:
Liz Gerena is a first generation, fourth-year undergraduate student at California State Polytechnic University, Pomona majoring in Gender, Ethnicity, and Multicultural Studies, with an emphasis in Gender and Sexuality. Their current research focuses on gender euphoria and how it specifically manifests in trans, Black, Indigenous, people of color. They were inspired to do this research because of their own personal experiences with gender euphoria as a nonbinary Latine person. In the future, they plan to pursue a Ph.D. in Gender Studies with the goal of becoming a college professor.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Noor Halabi
Mentor: Dr. Laila Jallo
Title: Size Distribution Analysis of Hydrophobic drug nanoparticles with metal-Polyphenolic Network Coating

Abstract:
Cancer has been identified as the 2nd leading cause of death in the United States. Advancements in nanotechnology have resulted in new cancer therapies involving the synthesis of drug loaded nanoparticles which are biocompatible, stable, and highly specific. To decrease the mortality rate of multiple cancers, efforts are conducted to encapsulate Paclitaxel, a common cancer drug, within nanoparticles to target and prevent the growth of cancer cells. One common obstacle faced when synthesizing nanoparticles is the presence of nonactive excipients (i.e. nanoscale delivery tools) as well as Ostwald ripening. Ostwald ripening is characterized by the agglomeration and growth of functional nanoparticles into deactivated crystals. However, catechol containing compounds are being investigated for their binding strength as well as their enhanced antitumor activity to address the aforementioned problems. Specifically, a polyphenolic-metal network was utilized to encapsulate the drug within the nanocore and offer stability for up to several months. Synthesis of the nanoparticles occurred through the use of microfluidic chips. Microfluidic devices have enabled the expansion of nanoparticle synthesis past the batch process in an effort to upscale their production. Efforts to decrease the mixing time required for the formation of nanoparticles included the use of hydrodynamic flow focusing (HFF), where the central flow is compressed by a sheath fluid. HFF has been proven to form a homogenous particle size distribution with little batch to batch variation. This research aims at manipulating flowrate and flow ratio parameters within the microfluidic chip to assess the homogeneity and uniformity in size of synthesized nanoparticles.

Biography:
Noor Halabi is a graduating Chemical Engineering major at the California state Polytechnic University, Pomona. In her previous years, she studied at Citrus College where she obtained her Associates in Biology, Chemistry, Physics and Mathematics. In addition to being a McNair scholar for two years, she works as a Supplemental Instructor for the Chemical and Materials Engineering Department under the Maximizing Engineering Potential Program. She is also the project manager for her senior design project which focuses on CO2 mitigation through green methanol and dimethyl-ether synthesis. Her current research lies at the overlap between medicine and engineering where it focuses on the synthesis of drug loaded nanoparticles that increase the bioavailability of cancer drugs. She plans to receive her Ph.D. in Chemical Engineering where she can gain the tools needed to expand the research surrounding the use of biomaterials in cancer targeting. She also plans on joining academia through professorship to help build a new generation of engineers. Her short-term goals is to attend graduate school and delve more into limiting the proliferation of cancers by targeting their environments. Her long-term goal is to become recognized in her field and become a professor at a public university where she aims to help first generation engineers follow their aspirations and succeed after graduation.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

George Manuel Hernandez
Mentor: Dr. Thomas Osberger
Title: Synthesis of Macrocyclic Bisbenzyltetrahydroisoquinolines by Pictet-Spengler Cyclodimerization

Abstract:
The constant evolution of pathogenic viruses worldwide has caused millions of deaths due to growing resistances to current treatments many of which have toxic side effects. The family of Bisbenzyltetrahydroisoquinolines (BBTHIQs), compounds found in plant natural products, has shown a wide array of bioactive effects against various viral and non-viral illnesses. Of note, members of the BBTHIQ family have been found to serve as potential treatment starting points against the parasitic-borne disease leishmaniasis. Investigation into the synthesis of BBIQs thus has potential for novel drug therapies to reduce toxic side effects and potential for increased drug metabolism and pharmacokinetic results in the prevention and treatment of leishmaniasis as well as other illnesses.
Though studies on these compounds and their synthesis have been conducted, an effective route for their total synthesis and use in drug discovery has not been advanced upon in recent years, and synthetic derivatives have not been widely studied. This study thus aims to find a pathway for the total synthesis of the core structure of the BBTHIQ Tiliageine through development and employment of modern organic synthesis and catalytic methods. We propose a short synthetic route to two linear cyclization precursors forming a key 'head-to-head' bi-aryl linkage, culminating in a planned Pictet-Spengler cyclodimerization not previously explored in the synthesis of BBTHIQs. To-date, we have accomplished several synthetic steps towards the preparation of our cyclization precursor molecules. The end goal of this study is to investigate the potential of these efficiently synthesized molecules as starting points for novel therapeutics.

Biography:
George Hernandez is a fourth-year undergraduate at California State Polytechnic University, Pomona majoring in Chemistry under the American Chemical Society option and minoring in Microbiology. He previously attended Riverside City College before transferring to Cal Poly and continues to support the success of transfer students on campus by being a Peer Mentor for the PolyTransfer program. He currently conducts research on campus in organic chemistry under the guidance of Dr. Thomas Osberger. George plans on receiving his Ph.D. in Chemistry and hopes to study the total synthesis of natural products and next generation organic materials. His future goals include obtaining a position as a university professor where he can share his passion for chemistry through teaching and inspiring the next generation of research scholars.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Jennifer Hernandez
Mentor: Dr. Seema Shah-Fairbank
Title: Comparison of Hard Engineering versus Bioengineering Against In-Stream Erosion

Abstract:
Urbanization and anthropogenic activities are major causes of riverbank and riverbed erosion. Erosion has been known to change the stream and river cross sections and profiles, which leads to potential damage to infrastructure (i.e., roads, bridges, levee) and aquatic habitat. To reduce the impact of erosion, both hard engineered (i.e., concrete, large rocks, retaining walls) and natural bioengineered (i.e., pole planting, coir rolls, tree & brush revetment, root wads, timber walls) design solutions can be implemented for stream and river stability. In semi-arid climates, such as Southern California, the effectiveness of bioengineered solutions is uncertain. Most bioengineered solutions require a constant source of water to be viable, which is not always possible in the region. This study evaluates the advantages and disadvantages of various types of in-stream and river erosion control solutions. To better guide regional design and practice, the use of governmental sites, case studies, past engineered projects, and peer reviewed articles aide in helping to identify, inventory, and map river stabilization in Southern California. Site visits are conducted to observe past implementation of hard engineered and natural bioengineered techniques and to point out environmental, and social impacts of each project. This study provides a GIS interactive map to document the existing river stabilization projects in Southern California and a design manual that describes the implementation, the design criteria, and the pros and cons to each technique. The overall goal is to guide practitioners and researchers in identifying the most effective technique to stabilize streams and rivers against erosion.

Biography:
Jennifer Hernandez is a fourth-year undergraduate student at California State Polytechnic University, Pomona who is studying Civil Engineering. In her previous years, she studied at Chaffey College. She has held internships at utility companies such as Southern California Edison and Metropolitan Water District of Southern California. Currently, she interns at Stantec, a private consulting firm. Her current research evaluates different hard engineering and nature-based techniques to control instream erosion while minimizing climate change impact. She plans to receive her Ph.D. in Civil Engineering where she can tackle the freshwater scarcity challenges in her community and in Southern California. Her long-term goal is to teach at a university with upward mobility that seeks to advance the water infrastructure especially in disadvantaged communities that have damaged or poor water infrastructure.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Ana Jurado
Mentor: Dr. Farbod Khoshnoud
Title: Self-Sustained Unmanned Aerial Vehicles

Abstract:
Interest in clean and renewable energy is at an all-time high as the environmental benefits, among other advantages of these energy sources, far outweigh those of fossil fuels. One source of clean energy that is gaining more attention is solar energy. As the costs of this energy continue to decrease, their popularity only increases. Solar panels are becoming more accessible to all and are now being used in various applications, not just their traditional use of providing power to buildings. Along with this rise in interest and use of solar energy, there is a rise in interest and use of small unmanned aerial vehicles, better known as drones. Drones are now not only used for pleasure, but they are finding their way into various industries. Being very compact and maneuverable, they can easily accomplish a wide variety of tasks that humans cannot. Their use is becoming more and more common in search and rescue, reconnaissance, and even space-related scenarios. A major problem that plagues these vehicles
despite their development to date, is their flight time, as it is very limited. This project is proposed to examine a sustainable way to increase the flight time of drones. This will be done by looking at how solar energy can specifically aid in lengthening the flight time of unmanned aerial vehicles. Utilizing lighter-than-air drones, filled with helium, and with solar panels mounted on them, the use of solar energy to lengthen the flight time of the drone will be examined to determine if it is a worthy improvement for these types of drones.

Biography:
Ana Jurado is a fourth-year undergraduate at California State Polytechnic University, Pomona graduating this semester with a Bachelor of Science in Mechanical Engineering and minors in Energy Engineering and Regenerative Studies. She has done research since her second year at Cal Poly Pomona and through these experiences has been able to explore different aspects of sustainability. Her current research focuses on solar energy and unmanned aerial vehicles, specifically lengthening the flight time of these vehicles using solar energy. She plans to pursue graduate education after graduation and hopes to complete her Ph.D. in Mechanical Engineering, doing research relating to sustainability and renewable energies. Outside of research and academics, Ana also enjoys being involved in on-campus organizations. She is the current President of Pi Tau Sigma, the Mechanical Engineering Honor Society, and the External Vice President of the American Society of Mechanical Engineers.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Gina Lalli
Mentor: Ansel Zhao
Title: The Effects of Metformin on the Development of Human Mesenchymal Stem Cells

Abstract:
Metformin is a widely prescribed drug to treat type 2 diabetes. The focus of this study is to explore potential effects it has on the development of human adult stem cells. Past studies have shown that diabetic patients who take Metformin have longer lifespans than those on other antidiabetic medications, but not how or why. Adult stem cells are functionally uncommitted cells that are capable of self-renewal and differentiation into functionality specialized tissue-specific mature cells. Different tissues have different types of adult stem cells, which are responsible for maintaining tissue homeostasis, tissue repair and regeneration. We hypothesize that the effect of Metformin on longevity may be partly attributable to its effect on stem cell development. Human mesenchymal stem cells (hMSCs) normally reside in adipose tissue and bone marrow. These cells can be easily isolated and expanded in vitro, and in response to different external stimuli, can differentiate into osteocytes (bone cells) or adipocytes (fat cells). This study aims to examine the effect of Metformin on the proliferation and differentiation of hMSC's after pre treating them with Metformin at physiologically relevant doses (1,5, or 25 ug/ml) or without metformin (control group) for short - (30 days) or long- (90 days) duration. Cells pretreated with or without Metformin have been frozen down and will be subjected to assays that help quantify their proliferation and differentiation efficiency. Comparisons will be made between control and Metformin treated groups, as well as between Metformin treatment groups. The goal is to obtain, reliable results by retreating the assays multiple times. This project is being conducted by Gina Lalli along with other lab students under the supervision and mentorship of Dr. Ansel Zhao Professor of Biology at Cal Poly Pomona.

Biography:

Gina Lalli is a fourth-year undergraduate pursuing a degree in Biology at Cal Poly Pomona. Previously Gina studied at Pasadena City College and Citrus College where she earned her Associate's degree in Biology. Gina is extremely involved in her community, volunteering at her daughter's school, chairing the HOA at her complex, working in the DMV office at CarMax, and teaching horseback riding to beginners at Bellaventage Farms. Gina is an avid rider, and is Horse Show Manager for the Cal Poly Equestrian Team. Her current research involves how Metformin, a diabetes medication, affects rates of proliferation and differentiation of human mesenchymal stem cells, specifically differentiation into osteocytes and adipocytes. Her plans are to receive a doctoral degree in medical and genomic research so she can contribute to advancements in science and medicine for the betterment of life, with preference toward research in horse health. She plans to apply to graduate school in the following academic year in the greater Los Angeles area. Her long-term goals are to remain in research after obtaining her PhD, and affiliating with a local University where she can conduct research and motivate the next generation to continue bettering the lives of humans and animals alike. Her short-term goals are to complete her current research project, and begin an equine related research project next year. She is a firm believer, and a testament to show interacting with animals can benefit both the human spirit and body. She would also like to be involved in furthering inclusivity and diversity in the science community by supporting future students through instruction and outreach.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Oona Iglesias
Mentor: Dr. Peter Hanink
Title: Effectiveness of the McNair Scholars Program at Cal Poly Pomona

Abstract:
The McNair Program, or the Ronald E. McNair Postbaccalaureate Achievement Program, is a federally funded higher education program designed to prepare eligible participants for doctoral programs through research, academic assistance and mentorship. The program was introduced to Caly Pomona in 1999 with the aim to diversify faculty in higher education and admits about 26 students per year. During the academic year, McNair Scholars have the opportunity to conduct and present research, as well as attend graduate school preparation activities. Most scholarly journals aim their focus on a certain area of the academic pipeline; high school to entrance of postsecondary school. These studies fail to explain efficacy of the secondary retention and graduation rates of the McNair program. My study will focus on measuring the effectiveness of the McNair Program by current scholar's feelings and attitudes towards the program. Research conducted will include a mixed methods approach to gather both qualitative and quantitative data. Data will be collected through semi-structured interviews, surveys and questionnaires from current McNair scholars at Cal Poly Pomona's McNair Scholars program. My quantitative method will consist of numerical data stemming from the McNair class evaluations. Qualitative data will consist of semi-structured interviews of current McNair scholars at Cal Poly Pomona as well as data collected from the class evaluations. Expected results from the study will expand further knowledge on how the program can better assist future cohorts in both their research and plans after their degree.

Biography:
Oona Iglesias is a first-generation college student in her third year at Cal Poly Pomona. She is a current Sociology major with a minor is Psychology. Since 2021, she has been a volunteer for the Reintegration Academy which then led her the Prison Education Project. Through these programs, she assists incarcerated and formerly incarcerated folks through expanded opportunities such as lifestyle courses, career development, and educational pathways. These experiences have strongly grounded her passion in supporting marginalized communities. Upon completion of her degree at Cal Poly Pomona, she plans to apply for JD/PhD programs to begin her path to becoming a family attorney as well as continuing her passion for humanitarian work.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Carlos Mendieta
Mentor: Dr. Kevin Autry
Title: Processing of Unlicensed Corrections via Event-Related Potentials

Abstract:
As a consequence of our society's exponential growth in communication and information access, the issue of misinformation continues to rise. Misinformation belief can persist despite correction, or even exist as a result of correction. This phenomenon is known as the continued influence effect. The goal of this study is to improve our understanding of the continued influence effect on a fundamental cognitive processing level using an electroencephalogram (EEG) to replicate and expand a previous study. The procedure for this study will require 36 subjects, which will be sampled through voluntary participation via the Sona System online platform. Each subject, while connected to EEG equipment utilizing a 32-electrode capping system, will be given the task to predict the contents of unique boxes accompanied by different licensed and unlicensed correction conditions. To ensure attentiveness, each subject will also be under the impression that they would take a memory test at the end of the experiment. We will analyze the magnitude of event-related potentials produced from the various correction conditions split randomly across 300 trials, which will allow us to estimate subjects' degrees of surprise. We predict that subjects will be more surprised in unlicensed correction conditions than licensed correction conditions and more surprised in all correction conditions than conditions without corrections or misinformation, reinforcing the continued influence effect during the processing of information. Predicted results will have broad implications important to producers and consumers of information, necessitating further exploration into effective strategies to practically correct misinformation

Biography:
Carlos Mendieta is a fourth year undergraduate at California State Polytechnic University, Pomona, who is studying Psychology. In his previous years, he studied at Chaffey Community College and served in the United States Army as a military intelligence professional. Currently, he works as a teaching assistant and as a research assistant for the Mental Processing Lab and the Social Psychology Lab. His current research explores our processing of corrected misinformation using electroencephalography, as well as socioeconomic factors associated with our judgments of others. He plans to receive his Ph.D. in Counseling Psychology, where he can acquire the necessary tools to teach, research, and serve underrepresented populations as a counseling practitioner. His short term plans include researching strategies to improve therapy outcomes for diverse populations and he intends to continue gaining experience in the field to fulfill his long term aspirations in academia as well as counseling. He was accepted into two Counseling Ph.D. programs beginning in the fall, and he plans to decide which program he will attend at the beginning of March.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Enner Mendoza
Mentor: Dr. Alex John
Title: Synthesis, characterization, and application of nickel salophen complexes toward catalytic cross-coupling

Abstract:
Cross-coupling reactions involve the formation of C-C bonds with the use of transition metal catalysts and are widely used in the pharmaceutical industry for drug discovery and the synthesis of new medicines. Traditionally, palladium complexes bearing phosphine ligands have been used for their enhanced selectivity and efficiency in cross-coupling reactions. However, research has been focused on the synthesis of phosphine-free ligands due to their sensitivity to moisture and air which can lead to catalyst decomposition. Furthermore, catalysts made from noble metals such as palladium increase the cost of application, creating a need for cheaper alternatives. Attention has been drawn towards catalysts made from first-row transition metals as they are earth-abundant, have low costs, and have little detrimental effects on the environment. Schiff bases have been used in many catalytic reactions due to their ability to coordinate with these transition metals while remaining stable in various oxidation states. Salophan ligands have been used due to their ease of synthesis and ability to modify substituent groups, allowing for the steric and electronic properties to be easily changed. Two Ni(salophen) complexes were synthesized from a 1) 1,2-phenylenediamine with a 3,5-di-tertbutyl salicylaldehyde and a 2) 4,5-dichloro-o-phenylenediamine and 5-fluoro salicylaldehyde in yields of 82.62% and 92.75%, respectively. The complexes were characterized by IR, C-NMR, and 1H NMR spectroscopy. Their catalytic activity towards the Suzuki-Miyaura cross-coupling reaction is presented herein.

Biography:
Enner Mendoza is a third-year Chemical Engineering undergraduate at Cal Poly Pomona. He transferred from Fullerton College where he volunteered as a math, physics, and chemistry tutor. He is captivated by research areas regarding energy, sustainability, and the environment. His passion for research and helping others learn has motivated him to pursue a Ph.D. in Chemical Engineering to become a university professor. Before teaching, Enner would like to work in the industry to develop or improve processes to achieve a circular and sustainable economy. His current research is focused on the synthesis of organometallic catalysts with applications to electrocatalytic water oxidation for hydrogen fuel production in addition to cross-coupling reactions for the formation of C-C bonds. Enner will be spending his summer at the University of Wisconsin-Madison in the REU program working on a project focused on kinetics and catalysis in the field of chemical engineering.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Davianna Moran
Mentor: Dr. Michael T. Giang
Title: Think About Sleep, Not Suicide: A Study on the Relationships Among Sleep and Suicidal Behaviors

Abstract:
Getting a good night's sleep plays an important role in proper functioning. Even a mild reduction of sleep can have a significant impact on both behavioral and cognitive functioning (e.g mood, memory, wakefulness). Good sleep quality consists of a satisfied sleep experience (ease of falling sleep and staying asleep), and good sleep quantity consists of an undistributed sleep cycle that averages 7 to 8 hours. With sleep, the body and mind energy are restored, which allows people to process the past day's experience, make room for new experiences, regulate emotions, and prevent physical illnesses (e.g. cardiovascular disease and obesity). When sleep suffers, the regulation of emotions and cognitive performance decreases and psychological issues, such as depression, increases. The present study explored the relationship sleep quality and quantity has with suicidal behaviors (e.g. suicidal ideation, suicide attempts, and depression. While sleep has often been connected to psychological adjustments, such as increased depression, the distinction between sleep quality and quantity are often overlooked. In addition, the link between sleep and suicidal thoughts and attempt has seldom been studied. Using Wave 4 data from the National Longitudinal Study of Adolescent to Adult Health (Add Health), correlation analysis found that poor sleep quality was significantly correlated with increases in depression ($r=.112$, $p<.001$), suicidal ideations ($r =.176$, $p<.001$), and suicide attempts ($r =.084$, $p <.001$). In addition, poor sleep quantity was significantly correlated with increases in depression ($r=-.047$, $p<.001$) and suicidal ideation ($r=-.039$, $p<.05$), but not suicide attempts ($r=-.005$, $p=.708$).

Biography:
Davianna is a third year undergraduate at California State Polytechnic University Pomona who is studying psychology. They first transferred from Mt. SAC where they developed their passions for advocacy and social justice as a peer mentor for REACH, a program that empowers foster youth. They have continued that advocacy by becoming a peer mentor here for Cal Poly's foster youth program Renaissance Scholars. They are also part of a research lab where they are examining the relationship between sleep and suicidal behaviors, along with depression. Davianna has also been admitted to Nebraska's Counseling Psychology Ph.D. program where they hope to obtain various skills to help accomplish their goal of becoming a multiculturally competent scientist practitioner. As for now, their goal is to finish their last semester here and continue their research.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Jacquelyn Moran
Mentor: Eligio Martinez
Title: Latina Women's Undergraduate Experiences and Mentorship in Preparation for Graduate School

Abstract:
This qualitative study examines the journey of four Latina women and their undergraduate experiences as it relates to mentorship in preparation for graduate school. Research shows that Latina students make up a small percentage of all doctoral programs. For this reason, it is important to understand college experiences that helped the participants decide on their graduate program. The interviews revealed the Latina women felt unsupported in their undergraduate programs. Other codes that emerged from the interviews were mentorship, the role of race and gender, the lack of diversity in the student population, a sense of belonging on campus, relationship building, community stereotypes, lack of preparation for college, and managing multiple family responsibilities. As a first-generation college student and Latina woman, I aspire to attend a graduate program and earn a doctorate in Education Policy. Coincidently, I can relate to the participants of this study because during K-12 I was unable to get support due to the lack of resources found in my low-income school district. A second barrier that impacted my childhood education was growing up as an English language learner. After leaving high school, I was eager to see if I would get more support at a four-year university. Learning from the four Latinas in this study will provide me with insight for graduate school and its expectations. More importantly, this study exposed me to a literature review and the research process while preparing me to become a researcher, scholar, and author in education.

Biography:
Jacquelyn Moran is a third-year undergraduate student at California State Polytechnic University, Pomona majoring in Liberal Studies within the College of Education & Integrative Studies. Her unique program offers a bachelor's degree and credential. Her current research focuses on women's experiences that impacted graduate school choices. She plans to pursue a Ph.D. in Education Policy with the goal of becoming an advocate for historically underserved communities and students with learning disabilities. Jacquelyn's passion for education stems from her experiences growing up in Santa Ana, CA, and her love for her baby cousin who was born with disabilities. In Fall 2023, she will apply to graduate school programs both locally and out of state.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Evelyn Ojeda
Mentor: Tatiana Pumaccahua
Title: DREAMers in higher education: Mental health challenges, supportive factors, and resiliency

Abstract:
DREAMers, or undocumented students, are heavily underrepresented in higher education. According to the American Immigration Council, the United States comprises 44.9 million immigrants, and among those immigrants, there are 10.3 million undocumented immigrants. However, only 454,000 undocumented immigrants are pursuing higher education, constituting only 2% of the student population in higher education. Although limited, past literature addressing DREAMers in higher education focuses on Latinx individuals and their political and legal challenges. However, there is a significant gap regarding their lived experiences in higher education, especially with a mental health focus. Therefore, the present qualitative study explored the mental health challenges, supportive factors, and resilience that DREAMers (AB-540, DACA recipients, TPS, ISRT eligible) encounter in higher education. Specifically, DREAMers from diverse racial/ethnic backgrounds were highly encouraged to participate. Moreover, the CRT UndocuCrit framework was used to highlight DREAMers' lived experiences and resiliency. The findings and limitations of the study will be discussed in the presentation. Notably, findings will illustrate fundamental information on the supportive and challenging factors that impact the mental health of DREAMers and their perseverance within higher education.

Biography:
Evelyn is a senior pursuing a bachelor's degree in psychology at the California State Polytechnic University, Pomona. Evelyn is presently involved in the Socioemotional lab and the McNair Program at her institution. As a McNair Scholar, Evelyn is currently working on her own research project that focuses on DREAMer's mental health challenges, supportive factors, and resiliency in higher education. In addition to her research involvement, Evelyn started a school applied practice at the Pomona Unified School District. As part of this experience, she has provided family, school mental health, and student support services with a PUSD mental health supervisor. Additionally, from the beginning of Fall 2022, Evelyn became a Sally Casanova Scholar. Evelyn's goal is to become a culturally aware trained psychologist to provide mental health resources in marginalized groups. Throughout her professional and personal life, she hopes to be an advocate and bring light to the importance of mental health.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Jasmine Penate
Mentor: Dr. Alejandro Zermeno
Title: What Factors Influence a Shift Away From Indigenous Identities and Cultures to Mainstream Western Culture Among Indigenous Guatemalans

Abstract: This study aims to investigate different factors that influence a separation from Indigenous identity, culture, and assimilation to the dominant western culture among Indigenous Guatemalans. Guatemala is often recognized for its beautiful landscapes, its rich cultural diversity, and for being one of the homes of the Maya Indigenous people. Maya identity, cuisines, cultural traditions, and language have been passed down for generations and continue to this day. With society constantly changing, many Indigenous individuals are increasingly assimilating to the dominant western culture and separating from their identities and cultures in both the United States and Central America. In Guatemala, there are over 20 Mayan dialects spoken. Some dialects that are not as common such as Xinca, Ixil, or Itza, are at risk of becoming extinct. These Mayan languages are what keeps Guatemala's culture and traditions alive. Research on assimilation among Guatemalans has focused on cultural differences between the United States and Guatemala, but limited research addresses the variety of factors that also influence western assimilation and separation of Indigenous roots. The area of focus will include departments Antigua and Sololá, Guatemala. This study aims to contribute to existing literature by investigating how various factors including mestizaje, cultural and language discrimination, economic inequalities, social media, and pop culture in film all influence a shift away from Indigeneity and toward assimilation of the dominant western culture among Indigenous Guatemalans. My qualitative study will consist of semi-structured in-depth interviews with Maya Indigenous individuals in both Guatemala and the U.S. Interviews will focus on individuals' feelings, attitudes, and given meanings regarding efforts to maintain their Indigenous identities, cultural traditions, assimilating to western mainstream culture, and their thoughts regarding the future of Guatemala Indigenous communities.

Biography:
Jasmine Penate is a first-generation college student and a current sociology major at Cal Poly Pomona. She currently works as a student assistant at Cal Poly's Care Center, where she assists other students on campus with resources to help them achieve their personal and academic goals. Jasmine also is a current participant in the Sociology Peer Mentoring program, where she helps fellow sociology majors at Cal Poly. Before attending Cal Poly Pomona, she attended Chaffey College and graduated in 2022 with an Associate degree in sociology. The courses taken in sociology and ethnic studies have largely sparked her interest in activism and social justice, encouraged Jasmine to further explore her Indigenous roots, and to pursue research on cultural preservation and social-environmental justice issues among Indigenous communities in Guatemala. Jasmine anticipates graduating from Cal Poly Pomona Fall of 2023 and will continue her studies to obtain a PhD in Sociology.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Brian Powers
Mentor: Dr. Corwin Aragon
Title: Practical Public Bioethics

Abstract:
In this paper I respond to Jessica Flanigan's Public Bioethics, who argues against "coercive, prohibitive public health policies" for ultimately self-regarding actions (170). In her view, the doctrine of informed consent is an anti-paternalist principle that has been applied in the private context but neglected in the public context. A private context would be someone's personal life, such as in a doctor's office. A public context would be like someone driving on a road or smoking in a restaurant. To her, "public health choices are not morally different from private health choices" (170). Flanigan believes that if a health decision affects that individual solely, then they should be allowed to make that decision freely. This applies even if these decisions reduce that individual's happiness and overall well-being. Such a principle would apply to seatbelt laws which prohibit individuals from driving without a seatbelt. I agree that people are entitled to the same liberties publicly as they are privately, but I think that there are practical considerations in the public context that warrant coercive health policy. One consideration is that private contexts have the ability to determine if individuals are informed when consenting to a health decision, while public contexts do not have this ability. I believe this epistemic discrepancy warrants policy that coerces an individual from harmful actions until it is reasonably certain that they are informed. Therefore, a policy of "minimally coercive" paternalism is warranted in public contexts. This is the best way to retain civil liberties while still promoting the autonomy of the individual.

Biography:

Brian Powers is an undergraduate student at Cal Poly Pomona pursuing a double major in philosophy and political science. He is the president of Philosophy Club. He plans on enrolling in a post-baccalaureate program in computer science and working in the private sector for a few years before coming back to school for a doctorate in philosophy. He is particularly interested in critical theory and the history of social ontological thought. One of the main topics he researches is the debate between Marxist humanists and structural Marxism. Outside of school, he tutors students at Mt. San Antonio College's writing center.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Ava Ruiz
Mentor: Dr. L. Lin Ong
Title: Gender, Race, and Ethnicity Disparities in Undergraduate Philosophy and Economics

Abstract:
While there is extensive literature focused on the underrepresentation of women and members of historically marginalized groups in STEM fields, the lack of representation of these groups is less understood in the social sciences and humanities. For example, positive experiences in introductory undergraduate STEM courses have been shown to significantly increase undergraduate retention in these fields, but little is known about the impact of introductory coursework in economics and philosophy, and their associated downstream educational influences. This research project addresses the current gap in the literature by analyzing these disparities using a unique, unpublished panel dataset of economics and philosophy students in a majority minority, public institution from Spring 2017. This data includes extensive pre- and post-course surveys, course grades, and additional academic administrative data. We will test the following hypotheses: 1) We expect to see differences between women/URM's desire to study phil/econ when compared to non-women/URMs, 2) Difference measures Attainment value and desire to study field will be positively correlated over the course of the semester, 3) Difference measures Belonging (university level) and desire to study field will be positively correlated over the course of the semester, and 4) Groups who feel that the course provides a high utility value (high utility value/low utility value) will increasingly report a desire to study philosophy/economics while groups who report a low utility value will decreasingly report a desire to study philosophy/economics. Given our results, we will propose possible intervention measures to support underrepresented undergraduate students in the fields of philosophy and economics.

Biography:
Ava Ruiz is a fourth-year Philosophy student at California State Polytechnic University, Pomona. Their current research focuses on the empirical and philosophical question as to why and at what rate do women and members of other historically underrepresented groups leave undergraduate Philosophy and Economics. Alongside research, Ava also volunteers as a peer mentor for lower-level undergraduate students who are looking to get into research. During the fall semester of 2023, they will begin to apply for in and out-of-state graduate school programs. They plan to apply to Ph.D. programs in Philosophy with a social and political area focus.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Juan Salcedo
Mentor: Dr. Claudia Garcia-Des Lauriers
Title: The Symbolism of Body Modification of the Maya Post-Mortem

Abstract:
The concepts of body modification that surround the Maya communities were deeply sacred. The symbolic nature of body modifications has techniques and rituals that are of importance to the Maya communities. While the Modern Maya are the descendants from the Ancient Maya in many ways, body modification is a concept that continues to be sacred to modern Maya communities. This study will focus on beliefs, rituals, and importance of the body of the maya communities. With the use of various anthropological and archaeological evidence, contexts, and approaches a holistic and contextualized perspective will be achieved to understand the importance of body modification. Utilizing the evidence of post-mortem bodies and archaeological evidence of pre-classical sites through Terminal Classical sites of Maya burials in the Mesoamerican region, the evidence will provide a comprehensive understanding of the importance of the body modification of the Maya. This Bioarchaeological approach will be viewed through the Maya practices of Cranial Modifications and Dental Modification. Cultural-historical perspective will be employed by the use of Life Course/ Life history approach that will contextualize the post-mortem bodies and sites from the Mesoamerica region. This approach will further, understanding of the Ancient Maya class system and lives. Other cultural context that will be utilized will be glyphs and art.
The Maya Glyphs provide a unique perspective of how the concepts of the body translates into writing and language. Art, pottery, and other material cultures depict rituals and beliefs of the concepts of body modification and significance of the body.

Bibliography:
Juan Salcedo is a 4th year undergraduate student at California State Polytechnic University, Pomona majoring in Anthropology, subplan in Archaeology with a Minor in Criminology. Juan Salcedo is a current McNair Scholar whose research delves into the cultural significance of Cranial modification and Dental Modification of Classic Maya communities. He plans to pursue a Ph.D. in Anthropology to gain skills and knowledge needed to academically support communities in pursuit of human rights and immigration rights. Juan Salcedo's short-term goal is gain experience in research and gain a deeper understanding of Mesoamerican communities. Juan Salcedo's long-term goal is to use ethical research to benefit communities that have been disproportional affected by inequalities and social disparities.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Stephanie Strain
Mentor: Dr. Mehrdad Hagi
Title: The change over time of mechanical properties of PLG 15-85 within a simulated human body

Abstract:
This study investigated how the mechanical properties of bioabsorbable polymers change overtime in a simulated human environment for the purpose of providing a synthetic equivalent to natural tendon for tendon repair. The FDA has approved PLGA for use in tissue grafts, tissue engineering scaffolds, sutures, and implantable medical devices. Because this copolymer is composed of monomers that are regularly a part of the human metabolism, they produce a minimal immunological response from the body, which can increase the rate of degradation in the body and reduce the chance of rejection. Current research has investigated the rate of degradation with different ratios of glycolic acid to lactic acid and found that higher ratios of glycolic acid result in fast degradation. However, the question of how this polymer degrades over time in terms of load carrying capacity has yet to be answered. For this project we used samples of PLG 15-85 and simulated the conditions found in the body with a 7.4 pH buffered saline solution. At weekly intervals we performed tests to evaluate the material degradation. These tests included tension tests (to find the strength and elongation of the material, which determine under what condition the material might fail), and stress relaxation and creep tests (to find the viscoelastic properties of the material, which determined how it responds to time-varying loads such as those produced by walking). From these results we hope to develop a model to provide insight into how much load, and what types of load, PLG 10- 90 can support in a patient whose torn ligament has been replaced with PLG 15-85.

Biography:
Stephanie Strain is a fifth year undergraduate at California State Polytechnic university, Pomona who is studying mechanical engineering. In her previous years, she studied chemistry at Saddleback Community college and continues to participate as an intern with the metropolitan water district in construction management. Her current research focus is on a bioabsorbable polymer currently used in biomedical applications. She plans to receive her M.S in Mechanical engineering from Cal Poly Pomona before pursuing a Ph.D in Material science. Her short-term plans include researching thermal energy storage in order to better understand the future of renewable energy. Her long term plans focus on advancing material innovation to further the development of fusion energy. During the spring semester of 2024 she will be applying to the masters program at Cal Poly Pomona.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Ruben Torres Romero
Mentor: Dr. Mohamed E. Aly
Title: Exploring Collaborative Robotic Environment at CPP Reconfigurable Space Computing Lab

Abstract
A collaborative robotic environment is a necessity when it comes to dealing with extreme conditions. Such environments help accomplish and speed up tasks that humans may find dangerous or out of reach. Unfortunately, there is no such environment for Unmanned Ground Vehicles (UGVs), but much interest lies in pursuing such an environment for Unmanned Aerial Vehicles (UAVs). A collaborative environment where both types of unmanned vehicles are required to create power efficiency and collaboration between both types through different methods of interfacing, leading to lightening up of workloads and exchange of critical information (data) through the correct avenues. If one were to be on the moon, various robots could care for each other or cooperate to accomplish a task without wasting much of their power and leading to the saving of time. Of course, this cannot be done without cyber security to prevent hacking, as hacked systems compromise the overall system's legitimacy and function in environments where they are applied. This undoubtedly will risk a mission's success whenever collaborative systems go rogue or haywire and do not collaborate as intended. This project aims to develop findings on how applicable a small UGV will be when it eventually becomes integrated into a collaborative robotic environment in scenarios such as disaster situations, extreme climates, or places such as on a different celestial body like the moon. Such places in the testing of such a collaborative system will be simulated through a generally controlled environment, as the aforementioned scenarios are incredibly hard to replicate. As such, data will be extrapolated from the controlled environment.

Biography:
Ruben Torres Romero is a rising and ambitious undergraduate at California State Polytechnic University, Pomona, studying Computer Engineering. He began his journey during hectic times and happened pushed through those times and would eventually join the program RIO, thanks to the help and support of his family and his incredible Advisor, Dr. Mohamed Aly. His current research involves a reconfigurable collaborative environment focusing on a UGV's abilities in extreme conditions and environments. He plans to take part in REUs or internships during the summer in different areas to expand his skill set and solve real-world problems. Ruben plans to become a professor or work in a lab to collaborate in novel computer-related fields. Ruben plans to receive his Ph.D. in Computer Science, and to accomplish this, in the fall quarter of 2023, he will be applying to various graduate school programs.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Ana G. Marroquin Tercero
Mentor: Dr. Kevin Autry
Title: Exploring the effects of the Mental Timeline on Memory

Abstract:
The goal of this study is to investigate the effects the mental timeline has on temporal information and memory dependent responses. This study will use electroencephalogram (EEG) to monitor the participant's brain activity throughout the experiment. The study requires a sample size of 45 subjects to reach sufficient power and account for potential data loss. Subjects will be capped using a 32 electrode system and will complete four blocks which consist of images which will be associated with the past or future preferences of the character they are introduced to. Participants will be told that they will be tested on their memory. Within the four blocks, each one will contain 10 study trials and 14 recognition trials. The trials will be presented to them on either the left or right side of the screen to mimic the mental timeline and how we associate the left with the past and the right with the future. The participant will be asked to recognize as many images and temporal associations as possible. The recognition phase will consist of the subjects being shown images which were either previously presented or newly shown to them. They will be asked to identify whether they have seen the images before, and if they have, to also state the temporal association of the image. We predict that subjects will better remember the information presented to them in congruent trials (e.g, past items presented on the left) compared to incongruent trials (e.g, past items presented on the right). We believe that they will recognize information better in congruent trials due to our understanding that temporal meaning and recollection is dependent on spatial location. If our prediction effect is found, this will provide greater understanding of how the mental timeline influences the recollection and recognition of memories.

Biography:
Ana Gloria Marroquin Tercero is a first-generation college student and American. She comes from a Latinx background, which she credits for providing her with the inspiration to work towards obtaining a Ph.D. She is in her second year of college at Cal Poly Pomona and has demonstrated throughout her time here her dedication and passion for learning and setting herself up for success. She has been recognized by the Dean and President as an exemplary student who reflects Cal Poly Pomona's mission. This summer she will be attending the University of Massachusetts Chan Medical School where she will be working in a lab conducting Neuroscience research. Her experience includes working in two research labs which have conducted research on the Mental Timeline and conducting EEG studies. She is working towards becoming a Neuropsychologist who will provide more accessible services to low-income, underrepresented immigrant communities like the ones she grew up and lives in, and work towards being able to see the change that is necessary within the medical field when it comes to BIPOC communities. She is looking forward to being able to further her academic and professional career alongside the support of the McNair Scholars program.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Alexis Trejo
Mentor: Dr. Sara Langford
Title: Dual Language Immersion Benchmarking Study

Abstract:
When it comes to learning a second language academically, schools can use a variety of approaches. Dual-Language Immersion are programs that immerse students in two languages-- one being the primary language and the other being the secondary language. This study is designed to benchmark all immersion programs in Southern California so that any one individual program can adequately determine how their own program compares. This helps the general improvement of programs across the region. An online survey was developed and approved by the institutional review board. The components of the survey are based on findings from past research on Dual-Language Immersion. Program directors will be asked to provide information about the program they run. Currently, due to circumstances out of our control, there is a roadblock to contacting the programs. The data we would collect is program-level and non-invasive in nature. However, the district would still like us to seek their approval before commencing data collection. Unfortunately, this would extend too far into the future to work with the McNair timeline. Consequently, we instead collected archival data from the district. This data is currently being analyzed. The data will provide insights into dual language immersion programs in southern California. These insights can provide historical context for comparing survey data collected in the future.

Biography:
Alexis Trejo is a third year undergraduate at California State Polytechnic University, Pomona who is studying Psychology and Communication Studies. In his previous years, he studied at Mount San Antonio Community College where he worked as a teacher assistant for Sal Castro Middle School in LAUSD for six years. His current research involves dual language immersion and the impact it can have on the retention of a foreign language. He plans to receive his Ph.D. in Counseling where he can better assist the Latinx community through professorship, research, and service. His current plans include doing research in Latinx mental health and sleep health. His long term plans involve Spanish speaking clients and being able to better assist within that community. He will begin a MA program in Counseling at Lehigh University in Fall 2023.

SCHOLAR ABSTRACTS AND BIOGRAPHIES

Ivy Wang
Mentor: Dr. Alex John
Title: Ligand effects in Molybdenum Catalyzed Oxidation of Benzylic Alcohols

Abstract:
Conventional methods of performing alcohol oxidation reactions pose severe economic and environmental consequences. Nevertheless, such methods are heavily relied upon due to the fundamental role of alcohol oxidation reactions in chemical processes used by various industries, such as the pharmaceutical and biofuel industries. With sustainability in mind, this project intends to evaluate an alternative method of alcohol oxidation using novel molybdenum catalysts. Due to a lack of research surrounding molybdenum catalyzed alcohol oxidation reactions, the role of each component will be thoroughly investigated through the evaluation of a diverse range of alcohols, including aliphatic, primary benzylic, and secondary benzylic alcohols. A comprehensive understanding of ligand effects on the novel catalysts in the context of these oxidations will also be developed. Under optimized conditions, these oxidations can be achieved over a 24-hour period at 120°C using molybdenum catalyst in a green solvent, dimethyl sulfoxide, which also acts as the oxidizing agent. As a result, the conversions and yields of these catalytic alcohol oxidation reactions vary from 20% to >99% based on the alcohol substrate used, and there is an evident efficiency linked with the use of the novel catalysts. The reaction is chemoselective and yields aldehyde as the sole oxidation product from primary alcohol substrates. A competing reaction pathway has been observed with certain electron-rich benzylic alcohols, resulting in the formation of corresponding olefins. With further optimization, these catalysts can be assessed for large-scale industry applications with the goal of pushing industrial processes to become more environmentally friendly.

Biography:
Ivy Wang is a 4th year student at California State Polytechnic University, Pomona studying Nutrition Science and Chemistry. In her time at this university, she has served on the executive board of Science Council, mentored new students, and worked as a full-time accountant for two years to finance her education. Her research assesses the use of metal complexes on important transformations for the chemical industry in order to identify greener alternatives to traditional methods. Along with her REU experience at Northeastern University studying sustainable biomaterials, Ivy hopes to use her skills and determination to address environmental issues through organic synthesis, inorganic chemistry, and material science. Her long-term goals are to pursue a career in industry with the intent of returning to academia to become a professor, who can use her experiences to support future scientists and innovators. Next fall, she will be joining UCI's Chemistry PhD program as a NSF GRFP Fellow.