



# 21<sup>st</sup> Annual Capstone Conference



**Saturday, April 23, 2022**

**9:00AM - 3:00PM**

**Demergasso-Bava Hall, DBH 167**

**University Honors Program**

**McNair Scholars Program**

**California State University Stanislaus  
One University Circle, Turlock CA 95382**

**(209) 667-3180**



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## Acknowledgements

Special thanks to the following faculty who generously agreed to serve as **Research Mentors**

for our **2021-22 Senior Capstone Research Projects:**

Sarah Bissonnette (Biological Sciences), Andrew Conteh (Politics and Public Admin), Jennifer Cooper (Biological Sciences), Jessica De Silva (Mathematics), Jose Diaz-Garayua (Geography), Andrea Duroy (Psychology), Jason Emory (Psychology), Steven Filling (Accounting and Finance), Deborah Forester (Psychology), Garrick Garcia (Psychology), Suditi Gupta (Psychology), Ayat Hatem (Computer Science), Erin Hughes (Politics & Public Admin), Wura Jacobs (Kinesiology), Sarbjit Johal (Politics and Public Admin.), Meggan Jordan (Instr. Faculty), Kyu Han Koh (Computer Science), Vincent Laus (Sociology), Ryan Logan (Anthropology), Victor Luevano (Psychology), Mirta Maldonado-Valentin (English), Amanpreet Manchanda (Chemistry), Sari Miller-Antonio (Anthropology), Brian Morsony (Physics), Dana Nakano (Sociology), Jamila Newton (Biological Sciences), Grace Paradis (Psychology), Jennifer Peltier (Nursing), Jason Pourtaverdi (Criminal Justice), Scott Russell (Chemistry), Jeffrey Scales (Biological Sciences), Staci Gem Scheiwiller (Social Sciences), Susan Stephenson (Art), Kaylee Tanner-Dillashaw (Public Health Promotion), Megan Thomas (Computer Science), Gerard Wellman (Politics and Public Admin.), Gary Williams (Psychology), Nan Zhang (Mgmt. Operations and Marketing)

**The following faculty taught in the Honors Program this year:**

Ralph Becker (Social Sciences), Ellen Bell (Anthropology), Tom Carter (Computer Science), Jeff Frost (Anthropology), Suditi Gupta (Psychology), Jamila Newton (Biological Sciences), Richard Randall (Political Science), Chad Redwing (Honors)

*Seniors in the Honors Program are encouraged to tackle complex problems using methods and knowledge drawn from relevant disciplines. Honors Program faculty and research mentors offer critical feedback and guidance along the way. The main objective is for students to explore, gather and analyze information effectively, and to reflect on the implications of what they have discovered. Group discussions help to promote thoughtful questioning. The goal is to communicate knowledge, judgments, and original perspectives based on careful inquiry, exploration and analysis.*

# 2022 Capstone Conference Schedule

Saturday - April 23, 2022

Demergasso Bava Hall, DBH 167

9:00AM - 3:00PM

9:00AM

Welcome

9:00-10:30AM

Senior Research Presentations

*\*15 Minute Break\**

10:45AM-12:30PM

Senior Research Presentations

*\*30 Minute Break\**

1:00-1:45PM

Junior Research Presentations

*\*5 Minute Break\**

1:50-2:30PM

Junior Research Presentations

3:00PM

Conference concludes

# Senior Capstone Presentations

**9:00AM – 12:30PM**

*Moderators: Dr. Ellen Bell, Professor of Anthropology, Director, University Honors Program  
Interim Director and Faculty PI, McNair Scholars Program*

*Ms. Cristal Perez, Administrative Support Coordinator, McNair Scholars Program*

9:00-9:15 AM:

**\*Claudia Mendoza Chavez** (Anthropology): Understanding the Needs of Latinx College Students During the COVID-19 Pandemic

**Faculty Mentor:** Dr. Ryan Logan

9:15-9:30 AM:

**\*Adriana Santos** (Psychology): COVID-19 vs. Racism: What causes more Anxiety?

**Faculty Mentor:** Mr. Garrick Garcia

9:30-9:45 AM:

**Isaura Patino** (Political Science): The Villanization of Undocumented Latinx Immigrants

**Faculty Mentor:** Dr. Erin Hughes

9:45-10:00 AM:

**Clarissa Gutierrez** (English): Attitudes About Language in the USA

**Faculty Mentor:** Dr. Mirta Maldonado-Valentin

10:00-10:15 AM:

**\*Noreen Singh** (Psychology): Children's Academics, Mental Health and Social Support During COVID-19 Learning

**Faculty Mentor:** Dr. Grace Paradis

10:15-10:30 AM:

**Melana Cook** (Business Administration: Accounting): Out with the old: Are Certified B Corps proving classic business theory obsolete?

**Faculty Mentor:** Dr. Jamila Newton

**10:30-10:45**  
**15 Minute Break**

10:45-11:00 AM:

**\*James Green** (Biology): Melt Gene Annotation in Various Drosophila Species

11:00-11:15 AM:

**Alexandra Heuston** (Chemistry): Pesticides Residue on Organic Fruit vs. Conventional Fruit

**Faculty Mentor:** Dr. Scott Russell

11:15-11:30 AM:

**Chelsey King** (General Biology B.S): The Potential and Problems of Gene Drive Technology

**Faculty Mentor:** Dr. Jamila Newton

11:30-11:45 AM:

**\*Tripti Singh** (Chemistry): Drug Delivery Using Double Helical Nanotubes  
**Faculty Mentor:** Dr. Amanpreet Manchanda

11:45AM -12:00 PM:

**Danielle Carpenter** (Anthropology, Biological Focus): Using Non-Invasive Imaging to Analyze Ancient Skeletal Remains  
**Faculty Mentor:** Dr. Sari Miller-Antonio, Dr Jeffery Frost

12:00-12:15 PM:

**Brendan Contreras** (Computer Science): Concluding UI Design Trends via Analysis of Controller-Based Video Game GUI  
**Faculty Mentor:** Dr. Megan Thomas, CS Department

12:15-12:30 PM:

**Victoria Aguilar** (English and Political Science): A War with No Front: Arms Trafficking in North America During the Twenty-First Century  
**Faculty Mentor:** Dr. Erin Hughes

## Junior Research Poster Session

**1:00PM – 2:40PM**

*Moderators: Dr. Ellen Bell, Professor of Anthropology, Director, University Honors Program  
Interim Director and Faculty PI, McNair Scholars Program*

*Ms. Cristal Perez, Administrative Support Coordinator, McNair Scholars Program*

1:00-1:05 PM:

**Christian Gerard Capuno** (Biological Sciences): Altered Aquaporin-4 (AQP4) Expression as a Novel Treatment or Prevention of Alzheimer's Disease  
**Faculty Mentor:** Dr. Jamila Newton

1:05-1:10 PM:

**Gillian Johnson** (Biology and Chemistry): Cockroach Chitin as an Antibiotic

1:10-1:15 PM:

**\*Heather Collins** (Anthropology): Ethnogeology: A Call for Interdisciplinary Studies of Indigenous Knowledge  
**Faculty Mentor:** Dr. Ryan Logan

1:15-1:20 PM:

**Kirstin Leventhal** (Business): Corporation's Responsibilities of Human Rights

1:20-1:25 PM:

**\*Edith Herrera** (Sociology): Gendered Attitudes and Beliefs Among Latinx Youth  
**Faculty Mentor:** Dr. Jennifer Whitmer

1:25-1:30 PM:

**\*Melissa Rubio** (Spanish and Psychology): Fluency vs. Literacy: Multilingual College Students

**Faculty Mentor:** Dr. Sandra Garcia Sanborn

1:35-1:40 PM:

**\*Daniel Pasillas-Pablo** (Public Health Promotion): Discrimination, Adverse Childhood Experiences (ACES) and Nicotine & Marijuana use Amongst Adolescents

**Faculty Mentor:** Dr. Wura Jacobs

1:40-1:45 PM:

**Mackenzie Creamer** (Psychology): Stress and Opioid Addiction

**Faculty Mentor:** Dr. Jason Emory

***1:45-1:50 PM***  
***5 Minute Break***

1:50-1:55 PM:

**Morgan Wilson** (Child Development): Social Media and its Impact on Adolescents

**Faculty Mentor:** TBA

1:55-2:00 PM:

**Jessica Lewis** (Public Health Promotion): The Relationship Between Mental and Physical Health of Caregivers and Caring for an Individual with Special Needs

**Faculty Mentor:** Professor Kaylee Tanner-Dillashaw

2:00-2:05 PM:

**Nina Lydon** (Psychology): The Efficacy of Music for Emotional Wellbeing During the COVID-19 Pandemic for College Students

**Faculty Mentor:** Dr. Andrea Duroy

2:05-2:10 PM:

**Joseph Lao** (Public Health Promotion): The Effects and Impacts of Subliminal Messaging on the Unconscious Mind

2:15-2:20 PM:

**Isabel Gaddo** (Biology): Corona Virus Stress

**Faculty Mentor:** Dr. Sudi Gupta

2:30-2:35 PM:

**Maya Young** (Sociology): A Hidden Epidemic: Domestic Violence and Resource Accessibility During the COVID-19 Pandemic

**\*Denotes McNair Scholars**

## **Abstracts of Senior Capstone**

# **Presentations**

## **A War with No Front: Arms Trafficking in North America During the Twenty-First Century**

Victoria Aguilar

One manifestation of globalization is the illegal selling and buying of firearms in North America wherein gun smugglers operate across and against the jurisdictions of Canada, Mexico, and the United States. In order to combat the unlawful trade of arms, the aforementioned countries may and have put forth gun control; however, despite their dealings with the same problem, the countries' approaches differ from one another. Since research has not focused on gun trafficking and gun legislation during the past five years, my study considers the current gun situation and the most significant policies that legislators in Mexico, the US, and Canada have proposed or passed. I hypothesize that the US will be the leading policy actor in the gun policy network and that domestic preoccupations limit international cooperation between the countries. I am utilizing policy network analysis and comparative analysis in which I will demonstrate the interactions between the policy actors in Mexico, the United States, and Canada through the lawmakers' policies and public statements, and I will compare and contrast the political systems of these countries. I expect that my results will demonstrate how Canada and Mexico respond to liberal U.S. gun policy.

## **Concluding UI Design Trends via Analysis of Controller-Based Video Game GUI**

Brendan Contreras

In all forms of software, particularly those of the entertainment industry, the User Interface (UI) of the software is as important to the design of this software as its functionality. The UI is how the user will interact and communicate with the software, and thus it is vital to build it in a way that is easy to understand, learn, and use in little time. Thus, understanding what choices will make for a good UI is handy knowledge. For this reason, the UI choices of video games will be examined, since there is very little formal, public research on this subject for the field of Human-Centered Design. The aim of this research is to study implemented UI's of a small subset of video games and estimate the effects of its design on the experience of the user in terms of how effective it displayed information and how responsive it was to user input. To this end, I will be examining specific elements from the UI's of four carefully selected video games, and obtaining data that seeks to conclude on the effectiveness of those elements and their impact on the user experience.

## **Using Non-Invasive Imaging to Analyze Ancient Skeletal Remains**

Danielle Carpenter

Ancient skeletal remains may hold many secrets, such as what diseases affected ancient populations, trauma, and violence. Studying ancient skeletal remains has been happening for years, but due to the finite, rare resource these remains are, studying them in depth can be difficult. We do not wish to destroy remains for scientific reasons, but what else can be

done to examine these remains? A way to study remains via non-invasive technologies is being used, but it is still a new way to study remains. My hypothesis looks at how non-invasive technologies such as CT scans, radiography, photogrammetry, and 3D virtual modeling can be used to examine fragile remains. If it is feasible to scan a bone using CT, uploading it to a 3D modeling program, and turning the CT into a 3D printable file so copies of the bone can be made in plastics or resins, it could possibly open a new way to study ancient skeletal remains without damaging, transporting, or possibly losing bones.

### **Out with the old: Are Certified B Corps proving classic business theory obsolete?**

Melana Cook

There exists an increasing interconnectedness between enterprises and the societies in which business is conducted. More often, investors and consumers are expecting corporations to work for the benefit of all stakeholders. The purpose of this study is to determine whether such expectation affects management decisions and whether businesses are moving away from shareholder primacy—that shareholders' interest should be considered first and weighted more heavily against other stakeholders (employees, consumers, community, and the greater society)—and towards a stakeholder's perspective of value creation. This study compares two types of corporate business structures: C-Corporations and the relatively new Certified B-Corporation (B Corp), a corporation with a declared public benefit as an aspect of its profit motives. Secondly, this study evaluates results from a survey of 50 business leaders conducted online to achieve a prospective opinion of what the future of business may hold. Participants were surveyed on the history of their enterprise, how often and to what extent they consider shareholder vs. stakeholder values, and the depth of their understanding of corporate social responsibility (CSR) initiatives and B Corps. Robust financial data of B Corps was unavailable at the time of this research as fewer than 20 are publicly traded in the United States; however, social value creation—inherent to B Corps—is compelling even traditional corporations to examine sustainable business practices and corporate governance. While the B Corp certification itself may not increase competitive advantage, the philosophy ingrained within may provide added value, an important consideration for future business leaders.

### **Melt Gene Annotation in Various Drosophila Species**

James Green

**Abstract not Submitted**

### **Attitudes About Language in the USA**

Clarissa Gutierrez

California has a reputation as a place of ethnic and linguistic diversity, due to its high immigrant population; however, negative language ideologies such as xenophobia, English-only policies, or English as a Second Language (ESL) courses still present themselves in society and school systems. In regards to linguistic diversity, California residents celebrate linguistic and ethnic diversity by keeping culture alive while being surrounded by negative ideologies. Because of these opposite ideologies present in society and school structures, I



believe the people of California are influenced by their environment when forming language attitudes leading to a mixed language ideology. To understand more about American language attitudes, I have collected data through surveys and interviews concerning multilingualism and language learning. The participants included in this research consist of California college students varying in age, major, and language identity. The survey results show five generally positive language attitudes towards multilingualism and five mixed responses towards language skills. Interview responses have been mostly positive amongst monolingual, bilingual, and multilingual speakers with a few interesting mixed ideology statements. Preliminary results show people have positive language attitudes and that the U.S. education system does not reflect their interest in language learning. Keywords: multilingualism, bilingualism, language attitudes, language learning, linguistic diversity.

### **Pesticides Residue on Organic Fruit vs. Conventional Fruit**

Alexandra Heuston

**Abstract not Submitted**

### **The Potential and Problems of Gene Drive Technology**

Chelsey King

Mosquito-borne diseases take the lives of over one million people every year. Researchers have been trying to determine a way to combat diseases transmitted by mosquitoes for many years by using biotechnology, including gene drives. Gene drive technology has incredible potential including being able to eradicate mosquito-borne diseases. This technology allows scientists to insert a desired gene into a population which spreads throughout that population until every individual has the desired gene. This study focuses on using different forms of gene drives to address the issue of mosquito-borne diseases. My hypothesis is that this technology is safe and effective enough to move to field studies. I used a multi-case study design and examined data from seven different experiments using this technology on different mosquito populations. I focused on the percent success rate and the rate of drive-resistance within each to determine its safety and effectiveness. I examined four experiments using gene drive population modification and three experiments using gene drive suppression. From my analysis of data, I saw a positive trend demonstrating the effectiveness of this technology with each experiment having a high percent success rate within 6-10 generations, spreading throughout the entire populations with an overall mean success rate of 99.1%. This study demonstrated that this technology is extremely effective, however, the lack of safety precautions has become a huge barrier to using this technology in the field. Safety measures must be determined so this technology can be used to its full potential.

### **Understanding the Needs of Latinx College Students During the COVID-19 Pandemic**

Claudia Mendoza

Even before the pandemic, Latinx college students encountered a variety of stressors and obstacles that made their college experience different from other students. Additionally, their status as immigrants, first-generation, and/or undocumented caused this segment of students to experience financial and social hardships in addition to deleterious impacts to their mental health. In this study, I assessed the experience of this population during the beginning of the pandemic via the use of ethnographic methods. Working under the theoretical framework of multigenerational punishment and structural vulnerability, two research questions guided this study: 1) What has been the impact of the COVID-19 pandemic on bilingual students in the Central Valley of California? 2) How is resource information being communicated to this population? I collected qualitative data through a survey (n=25) and semi-structured interviews (n=6). Findings have demonstrated the need for and yet lack of access to economic and mental health resources for this population. Participants described money as a resource that would most help them in that moment. Additionally, half of the participants also mentioned the need for mental health resources during this time. As informed through my research findings, I suggest ways CSU Stanislaus can better support this population. Specific concrete steps include more funding for psychological counseling or a wider reach on information regarding economic support and increasing financial literacy.

### **The Villanization of Undocumented Latinx Immigrants**

Isaura Patino

In today's society, the topic of immigration reform has sparked a lot of interest due to shifting policies on behalf of various representatives and their political outlooks. Therefore, I am interested in exposing the specific injustices undocumented Latinx immigrants have continuously been forced to face within different aspects of daily life due to challenging sociopolitical conditions. Furthermore, aside from being excluded from various sectors of society, this study will also examine the undocumented Latinx experience associated with living in the shadows of this country via in-depth interviews meant to highlight the specific costs and challenges endured. The in-depth interviews will incorporate a multitude of approaches, the most important, however, is that of qualitative research through the lens of phenomenology. In conclusion, the study aims to affirm that undocumented Latinx immigrants are indeed more likely to endure a more difficult life in the United States due to the lack of identity, opportunity, and benefits that exist for their documented counterparts.

### **COVID-19 Vs. Racism: What causes more Anxiety?**

Adriana Santos

The year 2020 was quite an obstructive, challenging, year that has left many scared in different aspects of live from losing loved ones to permanently shutting down many businesses due to the COVID-19 global pandemic. Along with another negative aspect that was raging across the U.S.A: racism. Year 2020 was a peak year in racism as the Black Lives Matter movement started a global phenomenon against racism due to the murder of George Floyd but unfortunately, this problem is still active along with COVID-19. My research was designed to examine the comparison of general anxiety levels created from racism and COVID-19 pandemic by comparing general anxiety levels. My participants were

people 18 and over and solely focused on Stanislaus State students. To be a bit more specific, I will allow within demographics to be identified in their own group such as Latinx/Hispanic. They will be asked questions to measure their anxiety levels. My analysis will be shown via an ANOVA test to differentiate the means between each variable. My results will show if whether one factor causes more anxiety than the other, which no matter what the results were, seeing these two factors terrorize society is alarming to witness to say the least. Keywords: Anxiety, COVID-19, Racism.

### **Children's Academics, Mental Health and Social Support During COVID-19 Learning**

Noreen Singh

Maintaining mental health and well-being has become increasingly important due to the COVID-19 pandemic. Social distancing and remote learning have made it hard for students to get the academic help and social support they need to thrive and succeed. Research suggests that elementary school-aged children may be the most vulnerable due to their reliance on teachers for support and guidance. The present online study examined the relationship between social support and stress, anxiety, and depression in elementary school children. Based on past research, we hypothesized social support will be negatively correlated with anxiety. Social support will be negatively correlated with stress. Social support will be negatively corrected with depression. Social support will be positively correlated with academics. Participants (n=24) were randomly selected through flyers, word of mouth, and a letter sent to the child's parents outlining the procedure and study. After getting the parent's consent and the child's assent, a survey link was emailed to parents. Child participants filled out two out of the anxiety, stress, and depression measures; parents filled out the demographic questionnaire. Significant correlations were found between the following variables: stress and family time ( $p = .04$ ). These findings show that as time with family increases, stress decreases. This may be an important relationship to help buffer some of the adverse situations caused by the pandemic. Unfortunately, the sample was small, limiting how generalizable these findings are to families at large. Future research may want to further explore specific family activities that may relate to mental health factors, such as stress.

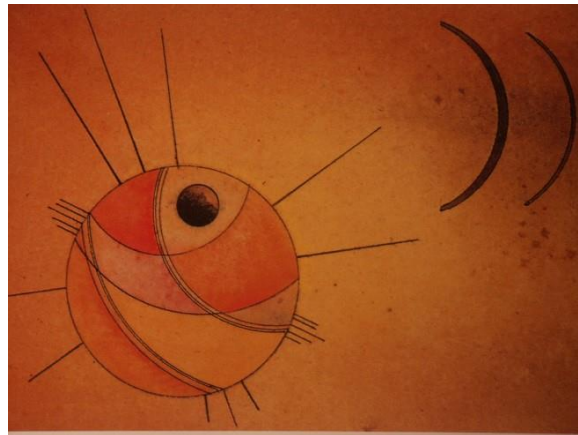
### **Drug Delivery Using Double Helical Nanotubes**

Tripti Singh

**Abstract not Submitted**

## **HONORS PROGRAM COMMUNITY STATEMENT**

The Honors Program at CSU Stanislaus is a community of scholars bound together by vital principles of academic openness, integrity, and respect. Through focused study and practice involving exploration and discovery across a variety of disciplines, the Honors Program upholds these principles of scholarly engagement and provides students with the necessary foundations for further research and inquiry.



Our interdisciplinary curriculum is integral to this work and is intended to facilitate creative understanding of the irreducible complexities of contemporary life and knowledge. Personal and intellectual honesty and curiosity are essential to this process. So, too, is critical openness to difficult topics and respect for different perspectives, values and disciplines. The Honors Program aims to uphold these virtues in practice, in principle, and in community with one another.